5th National Conference of Society of Radiographers & Radiological Technologists (SORRT)

&

National level Conference of Student Radiological Technologists

Souvenir

Theme

"INTELLIGENT IMAGING - A patient based approach"

Organised by SORRT &

Department of Radiology and Imaging &
College of Radiological Sciences
DrJeyasekharan Medical Trust, Nagercoil-3.

Date 24th & 25th September 2022

Venue St.Peter's CSI Church Campus

Place Kanyakumari Tamil Nadu, INDIA

38 Years of Safety Regulation 1983 - 2021

परमाणु ऊर्जा नियामक परिषद

Atomic Energy Regulatory Board

आज़ादी का अमृत महोत्सव

भारत सरकार
GOVERNMENT OF INDIA

गुंटूर नागेश्वर राव
G. NAGESWARA RAO
अध्यक्ष
CHAIRMAN

MESSAGE

I am delighted that Society of Radiographers and Radiological Technologists (SORRT) and Department of Radiology and Imaging, College of Radiological Sciences, Nagercoil are jointly organizing 5th National Conference of SORRT and National Level Conference of Students Radiological Technologists during September 24-25, 2022 at Kanyakumari, Tamil Nadu. The theme of the Conference "*Intelligent imaging- A patient based approach*" is relevant to current development in Diagnostic Radiology.

Diagnostic imaging is an essential branch of medicine used for rapid diagnosis in the healthcare field. The technological advancements in the X-ray beam generation and detector technology has achieved the great success in minimizing radiation dose to patients as well as operators. The introduction of Artificial Intelligence (AI) in diagnostic radiology is a boon to the accuracy and efficiency to the diagnostic information in all the diagnostic modalities.

It is worth mentioning that Atomic Energy Regulatory Board (AERB) is revising its regulatory safety documents in line with advancement in the technology to achieve the safety objective in the practice. AERB has been continuously striving to enhance radiation protection of workers, members of the public and optimization of radiation doses to patients by publishing booklets on radiation protection and regulatory aspects in diagnostic radiology practice so that maximum benefit can be achieved with use of the equipment. As part of Azadi Ka Amrit Mahotsav celebrations this year, AERB organized a lecture series on 'Radiation Protection in Diagnostic Radiology' in various languages at YouTube Platform for spreading radiation safety awareness.

AERB acknowledges SORRT contributions in promoting safety awareness among working professionals and new entrants for enhancing their skill, knowledge and update on regulation in the practice of medical imaging. I compliment the SORRT for its commitment to this objective by organizing regular conferences bringing together both experts and aspirants for sharing knowledge which provide a platform to the aspiring radiographers to enrich their knowledge in the field of radiography technology and radiation protection methodology. I wish the Conference a grand success.

(G. Nageswar Rao)

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Prof. P.M.VENKATA SAI M.B.B.S., D.M.R.D., Dip. N.B. (Radiodiagnosis) Ph.D.,F.I.C.R.
[Fellow of Indian College of Radiology and Imaging] is the Senior consultant, Professor, Former Head of clinical services and Head of Department of Radiology and imaging sciences (Centre of Excellence in Radiology and Imaging sciences) at Sri Ramachandra Medical College and Research Institute (SRIHER), Porur, Chennai – 600 116, Tamil Nadu, India.

Message from Guest of Honour

I feel very privileged to felicitate 5 th National Conference of Society of Radiographers and Radiological Technologists (SORRT) & National level conference of Student Radiological Technologists at Kanyakumari on 24 th &25 th September 2022 with A theme "INTELLIGENT IMAGING – A Patient based approach". The students are the future leaders, and every student should learn and take ideas from these types of conferences and succeed for their brighter future. The organisers of this conference bring the best teachers to share their knowledge with young dynamic motivated students to sharpen their skills. Dedicated service for the best of society comes back in an unexpectedly positive way.

I would like to pray and wish each one of you the very best for the success ahead.

Sd/-

P.M.VENKATA SAI

Dr.Devaprasath Jeyasekharan,
M.S.(Gen.Surgery), F.A.M.S.Urology (Vienna).
Managing Trustee.

Dr.Jeyasekharan Medical Trust,
K.P.Road, Nagercoil – 629003,
Tamilnadu, India.
Phone : 04652 – 230019, 230020.
Email : jeyasekharanmedicaltrust@gmail.com

Date : 07-09-2022

MESSAGE

I am pleased to learn that the Department of Radiology and Imaging & College of Radiological Sciences is organizing the National Conference of Society of Radiographers & Radiological Technologists (SORRT) on 24th & 25th September 2022 in Kanyakumari.

The Theme "Intelligent Imaging – A patient based approach" is very appropriate in this era of patient care. As the Imaging Technology is improving the clinicians are benefitted with the crisp diagnosis and many many invasive procedures are performed with the help of the Radiology Department.

My personal wishes to the Organizing Chair Person Mr.A.P.Berry and the Organizing Secretary Mr.Rengit Singh.

I wish the conference all the success.

With regards,

Dr.Devaprasath Jeyasekharan
Managing Trustee

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General Administrator
Mrs. SUJATHA RANJIT M.A., Dip. in Hospital Administration, M.B.A. (Hospital Administration)

Dr. Sabu Jeyasekharan
Trustee & Principal
Dr.Jeyasekharan Medical Trust,
K.P. Road,
Nagercoil – 629 003.
Tamil Nadu, India.

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MESSAGE

Very happy to be part of 5th National Conference of Society of Radiographers and Radiological Technologists (SORRT) and National Level Conference of Students Radiological Technologists at Kanyakumari from 24-09-2022 to 25-09-2022. Best wishes for the Organizing team and for faculty and delegates.

Sd/-

Dr. Sabu Jeyasekharan

Dr. JEYASEKHARAN MEDICAL TRUST
Dr.JEYASEKHARAN HOSPITAL & NURSING HOME

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(Late) Dr. N.D. Jeyasekharan, M.B.B.S., F.R.C.S.
(Late) Mrs. M. Rani Jeyasekharan, Msc.,

MANAGING TRUSTEE :
Dr. D. Devaprasath Jeyasekharan, M.B.B.S., M.S.(Gen.), F.A.M.S. Urology (Vienna)
TRUSTEES :
Dr. S. Sabu Jeyasekharan, M.B.B.S., M.S.(Gen.) (Gastroentrologist)
Dr. J. Ranjit Jeyasekharan, M.B.B.S., D.M.R.D.,M.D (Gen. Med)

12-09-2022

MESSAGE FROM CHIEF PATRON

I am truly honoured and pleased to be accepted as the Chief Patron for the 5th National Conference of the Society of Radiographers and Radiological Technologists. I am happy to know that the members of the Association of Kanyakumari District have come forward to organize this National Level Conference. My hearty congratulations to Mr.Rengit Singh, Organizing Secretary, Mr.Kingston, Treasurer and all the committee members for their role in organizing this conference. I would also like to congratulate Mr.A.P.Berry for remaining as a guiding force and supporting the organizers.

I sincerely wish you all the very best for a grand success of this conference and also wish all the delegates an enjoyable meet.

Dr. J. RANJIT JEYASEKHARAN.
Trustee
Dr. JEYASEKHARAN MEDICAL TRUST

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MESSAGE

I Congratulate the Organizers and participants of the 5th National Conference of Society of Radiographers and Radiological Technologists (SORRT) and National Level Conference of Students Radiological Technologists at Kanyakumari from 24-09-2022 to 25-09-2022. I extend my best wishes for the success of the Conference.

SOCIETY OF RADIOGRAPHERS AND RADIOLOGICAL TECHNOLOGISTS INDIA (SORRT)

REG: NO : 10/99

NAGERCOIL. 629 003. India.

e.mail: admin@sorrt.in, sorrtindia@gmail.com Website: www.sorrt.in

A.P.BERRY	Y.KINGSTON	A.RENGIT SINGH
PRESIDENT	TREASURER	GEN.SECRETARY

President 's Message

Dear Senior Colleagues, junior colleagues and students,

Greetings to you all!

I am glad to say a warm welcome to you all.

It's an opportunity to say hello with a mixed feeling of sorrow and happiness since the covid 19 has swallowed many of our fellowmen and we are meeting together after two long years. Our last conference was held in the time of despair and fear as the pandemic was preparing to draw nearer. We were fortunate since many of our Indian and foreign delegates could reach safely after the conference.

As the entire world is marching towards the digital era, we have also decided to have a digital souvenir. This would enable us to have soft copy articles and scientific papers.

I am sure this conference will make our professionals unite to study together and will have happiness. We will have enough messages to take home as we will meet stalwarts in our field of medical imaging. I am sure you will enjoy the mother natural beauty where three seas meet where serenity of faiths merge with the sunrise and sunsets seen together in awesome splendour in different solemn harmony!

Yes!! The unimaginable growth of scientific advancement should not leave us behind. So it should be a time of rejuvenation, refreshing and updating. I thank Mr. Rengit Singh, the founder of this society and general secretary, Mr. Kingston the treasurer and Prof. Panneer Selvam the Chairman of the Scientific session for their tireless work and sleepless nights for the maiden venture to make this conference a great success

Enjoy, learn, teach and take home the glimpses and values of human relationships. Wish you all wonderful time and take care. Greetings and with warm regards,

APBerry

A P Berry
President, SORRT

Prof. S. Panneer Selvam
Chair person Scientific Committee
(5th NCSORRT)
Sri Ramachandra Institute of
Higher Education & Research
Chennai

It gives me an immense pleasure to welcome you all to the 5th NCSORRT - 2022, National conference at Kanyakumari , Tamilnadu.

It is indeed a matter of great privilege and honour for me to be a scientific committee chairperson for this wonderful National conference. The scientific highlight of the two day conference will include Oration , Guest talks from the experts in the field of Radiology and Imaging technology, a series of Proffered Papers from Technologists and Young dynamic faculties.

Oral and Poster presentations from Students is the highlight of the Conference

Students Oral Presentation (30) and Poster Presentation (30) are included in the Scientific Schedule to motivate and encourage them

I hope this conference would provide a platform for fruitful interaction among technologists and students . Exchange of ideas and experience with eminent faculties in this field will definitely enhance the knowledge, which will elevate the standard of services rendered towards the ailing humanity.

I wish all the delegates a happy and memorable time at Kanyakumari.

S. Panneerselvam

5th NATIONAL CONFERENCE OF

SOCIETY OF RADIOGRAPHERS & RADIOLOGICAL TECHNOLOGISTS and National Conference of Student Radiological Technologists (SORRT)

September 24& 25 – 2022 KANYA KUMARI

Mr.Y.Kingston,
Treasurer 5thNCSORRT & SORRT,
Incharge, Department of Radiodiagnosis,
Dr.Jeyasekharan Hospital,
Nagercoil. 629003

Message From the Treasurer

Warm greetings from 5th NCSORRT Organizing Committee and SORRT. It is my pleasure to invite you all for this Special event.

I take this opportunity to thank all the radiological Technologists who has supported for the success of the 5th NCSORRT.

I am sure, the deliberations at this meeting will enrich you professionally and return with memories of an excellent academic and social get-together to be cherished for long.

Wish you all a pleasant time and experience.

Y. Kingston
Treasurer
5th NCSORRT

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A.P.BERRY	Y.KINGSTON	A.RENGIT SINGH
PRESIDENT	TREASURER	GEN.SECRETARY

From the Desk of Organising Secretary

I record my heartfelt and warm welcome to you all!!

It is my utmost duty to thank God the creator of the entire universe for granting the opportunity to innovate the opportunity to gather the Radiographers and Student Radiographers at Kanyakumari to share the knowledge of scientific development in various fields of imaging and in other related areas like Radiotherapy and Nuclear Medicine so on and so forth. It is my proud privilege to mention that such a great number of student delegates have gathered in this place where the three seas meet.

It is a historical record that unassumingly papers have reached and we were constrained to stop registration and minimize the scientific papers. It is sure to admit that this field is keeping on increasing in a tremendous level.

Further, I would like to convey my sincere thanks and gratitude to all those who have participated. who have made it possible for the dream became a reality. This society is ever grateful for the guidance and encouragement of our organizing Chief patron, Dr.Ranjit Jeyasekharan, the Chair person, Mr.A.P.Berry, the Treasurer, Mr.Y.Kingston and Scientific committee Chair person Prof. S. Panneer Selvam towards the betterment of the programme a great and memorable!.

Again a big thanks are due to the members of the managing committee of Dr.Jeyasekharan Medical Trust for conducting this programme a success in this place for the 7th time.

Once again Thanks to one and all. Wishing all the delegates an enjoyable and pleasant memories!

A.Rengit Singh
Organising Secretary

5th National Conference of SORRT

PROGRAM SCHEDULE (24.09.2022) DAY – I : Saturday

8.00am - 9.00am	**BREAKFAST / REGISTRATION**		
Session 1			
TIME		**TOPIC**	**PRESENTER**
09.00 am – 09.10 am	**P -1**	Understanding of Radiation Units and Quantities	Mr.L.Dhanush Medical physicist & Asso. Professor Shri Sathya Sai Medical College , Chennai
09.15 am – 09.25 am	**P -2**	"Multiparametric Approach To Radiation Dose Reduction Strategy In CT Head Obtained On Different CT Scanners Installed In the Department Of Radio-Diagnosis and Imaging at P.G.I.M.E.R., Chandigarh – A Catphan 500 Phantom Study"	Aditya Nagrath , Senior Technologists PGI, Chandigarh
09.30 am – 09.40am	**P -3**	Estimation of Radiation Dose to Thyroid and Gonads During CT Thorax examination	Jaseemudheen MM Assistant Professor KS Hegde Medical Academy NITTE
09.45 am – 09.55 am	**P -4**	Introduction to the concept of Radioactivity and Modes of Radioactive Decay	M. Jayalakshmi Ezhilvizhian , Faculty , Aarthi Scans Pvt Ltd, Chennai
10.00 am – 10.10 am	**P -5**	PET/MRI SYSTEM DESIGN	T. Manojkumar Medical Physicist, Assistant Professor, KG Hospital
Session 2			
10.10 am – 10.30 am	**G-1**	Problem based learning (PBL) & its effectiveness in teaching & learning , Equipment operation & maintenance for radiography students.	Mr.Tamijeselvan S, Puducherry
10.30 am – 10.50 am	**G-2**	Emerging trends in Radiological imaging study of Neurocysticercosis at rural tertiary care health centre in Etawah district of Uttar Pradesh	Mr.Sunil Saxsena, Saifai , UP
10.50am – 11.10 pm	**G-3**	Cryoablation	Mr.Yogananda TMH , Mumbai
11.10 am – 11.30am	**G-4**	Discography – A Presurgical Evaluation	Prof .J.Venkat , Global Hospital , Chennai
11.30 am – 12.30pm	**INAUGURATION**		
12.30 pm – 01.00pm	**ORATION** **Dr.P.M.VenkataSai , Professor of Radiology , SRIHER , Chennai.**		
12.30 pm – 01.00pm	**LUNCH**		
Session 3			
02.00 pm – 02.10 pm	**S-1**	Prominence Of Diagnostic Imaging To Get Right With Sensory Neural Hearing Loss – A Retrospective Study Analysis	Aravind Raja. K , Bsc.Rit 3rd Year Aarthi Scans Pvt Ltd , Chennai
02.15 pm – 02.25 pm	**S-2**	Biometric Evaluation Of Dental Cone-Beam Computed Tomography Prior To The Planning Of Dental Implantation	Ayyappan.S , Bsc.(3rd Year) Aarthi Scans Pvt Ltd , Chennai
02.30 pm – 02.40 pm	**S-3**	Radiographic Assessment Of Long Bone Orthoscanogram	Mr.Naveen Kumar A , B.Sc (3rd Yr) , SRM Institutes For Medical Science,Vadapalani

02.45 pm – 02.55 pm	**S-4**	The Contraindications And Criteria Of Radiology "Is It Still A Concern In This Modern Age?"	R. Adityan Final Year M.Sc., Kmch Institute Of Allied Health Sciences, Coimbatore.
03.00 pm – 03.10 pm	**S-5**	Sonographic Imaging In Male Infertility	Maneesh S, B.Sc.,RIT (Internee) SRIHER, Chennai
03.15 pm – 03.25 pm	**S-6**	Comparison Of Computed Tomography Hounsfield Unit With Shear Wave Elastrography In Characterisation Of Fatty Liver	Amirtha Varshini K, B.Sc Rit (Internee) ,Meenakshi Academy Of Higher Education &Amp; Research, Kanchipuram
03.30 pm – 03.40 pm	**S-7**	Fusion Imaging	Kalyan Babu Thumati, 2nd Year Bmit Acharya Bangalore
Session 4			
03.45 pm – 03.55 pm	**P-6**	Artificial Intelligence based Disease Diagnosis & Treatment of Cancer in Healthcare	Dr.C.Senthamil Selvan ,Lecturer&RSO MGMC&RI , Puducherry
04.00 pm – 04.10 pm	**P-7**	Classifaction Of Non-Small Cell Lung Cancer Using Ct Thorax Based Radiomic Features	Aishwarya , Lecturer Dr. Jeyasekharan Medical Trust, Nagercoil, Kanyakumari.
04.15 pm – 04.25 pm	**P-8**	Fluoroscopic Rescue Of Failed Endoscopic Stent Placement For Obstructing Colorectal Malignancy- An Alternative Technique	Mr.Vayshak K.V Lecturer A.C.S Medical College And Hospital , Chennai.
04.30 pm – 04.40 pm	**P-9**	Evolution In Computed Tomography	Praveenkumar S , Lecturer Meenakshi Academy of Higher Education & Research, Kanchipuram
04.45 pm – 04.55 pm	**P-10**	CT Angiography(CTA)	B.Haridoss , Selction Grade Radiographer Govt Stanley Medical College And Hospital.
05.00 pm – 05.10 pm	**P-11**	CT Guided interventions	S.Thulasi Dass , SRIHER , Chennai
05.10pm – 05.20 pm	**P-12**	CT Imaging Of Acute Abdomen- A Practical Approach	R Inbasagar , Assistant Professor Vinayaka Mission's Research Foundation - Salem
05.20 pm – 05.30 pm	**P-13**	CT -TAVI, TAVR, TMVR PROTOCOLS	M.Kartheeswaran , SRIHER , Chennai
Session 5			
05.30 pm – 05.40 pm	**S-8**	A Retrospective Evaluation Of The Differential Diagnosis Of The Small Bowel In Computed Tomography	Ramapratheepa M. BSc.Rit (3rd Year) Aarthi Scans Pvt Ltd
05.40 pm – 05.50 pm	**S-9**	Ct Virtual Colonoscopy	Ms Dakshatabetkar , M.Sc., MIT Kshema , Nitte , Mangalore
05.50 pm – 06.00 pm	**S-10**	CT Triple Phase Liver	Sanjay Kumar S , Bsc Rit [Intern] Gov Chengalpattu Medical College And Hospital
06.00 pm – 06.10 pm	**S-11**	Triphasic CT Scan-Liver: Scan Protocol Modification To Obtain Optimal Vascular Contrast	Abhijith S, MSc MIT Kshema , Nitte , Mangalore
06.10 pm – 06.20 pm	**S-12**	Ivc Filter Placement	Magesh S Bsc (Internee) SRIHER, Chennai
06.20 pm – 06.30 pm	**S-13**	Advancements In Endovascular Aneurysm Management	Blossom Fernandes, MSc MIT, Kshema , Nitte , Mangalore
06.30 pm –	**S-14**	Non-Vascular Interventional	Rivadoh , B.Sc Rit 3 rd Year

06.40 pm		Radiological Procedure : Vertberoplasty	Dr. Jeyasekharan Hospital Nagercoil
06.40 pm – 06.50 pm	**S-15**	Digital Subtraction Angiography And Its Post Processing Technique	Sandhiya Bharathi B.Sc. RIT Sri Manakula Vinayagar Medical College & Hospital Puducherry
07.00 pm onwards	**CULTURAL PROGRAM Followed by DINNER**		

5th National Conference of SORRT

PROGRAM SCHEDULE (25.09.2022) DAY – II : Sunday

8.00am - 9.00am	**BREAKFAST**	
Session 6		
TIME	**TOPIC**	**PRESENTER**
08.00 am – 08.10 am	**S-16**	Imaging Of Wilms Tumor	Balachander Bsc MIT Saveetha College Of Allied Health Sciences
08.10 am – 08.20 am	**S-17**	Diagnostic And Prognostic Role Of MRI In Spinal Trauma	Akash Bn, (B.Sc 2nd Year) Rajeev College Of Allied Health Sciences, Hassan,Karnataka
08.20 am – 08.30 am	**S-18**	Selection Of Suitable Variety Of Banana As Negative Contrast In MRCP	Revvaty Ravi , Shrisathyasai Medical College And Hospital
08.30 am – 08.40 am	**S-19**	Onco Imaging Of Endometrium In MRI	Usha BSc Radiology Kidwai Memorial Institute Of Oncology Bengaluru
08.40 am – 08.50 am	**S-20**	MR Defecogram	Sharan Subash.V, B.Sc.Radiology, Internship, Psgimsr, Coimbatore.
08.50 am – 09.00 am	**S-21**	MR Dynamic Contrast Enhancement To Assess Malignant Or Benign With Help Of Kinetic Curve In Breast Imaging	D Alphones Msc MIT Second Year Saveetha College Of Allied Health Sciences
09.00 am – 09.10 am	**S-22**	Role Of MR Spectroscopy In Characterisation Of Breast Masses	Dhanalakshmi S
09.10 am – 09.20 am	**S-23**	Diagnostic Evaluation Of Multiple Sclerosis Using Double Inversion Recovery Sequence	Hassan Basha.A Bsc Intern K.A.P. Viswanthan Govt Medical College Trichy.
09.20 am – 09.30 am	**S-24**	Newly Developed Methods In Reducing Motion Artifact In Pediatric Patients Abdominal MRI	Yuvasri E B.Sc.,RIST (Internee) SRIHER, Chennai
09.30 am – 09.40 am	**S-25**	A Practical Approach To Optimize Patient Dose In CT	Manjula S, Bsc Mit Intern SRM Institutes For Medical Science
09.40 am – 09.50 am	**S-26**	Biological Effect Of Radiation	M.S Abdur Rahman B.Sc Rit 3RD Yr Dr. Jeyasekharan Hospital Nagercoil
09.50 am – 10.00 am	**S-27**	Radiation Signages	Mr.Nanthakumar B.Sc Rit 1st Year Dr. Jeyasekharan Hospital Nagercoil
10.00 am – 10.10 am	**S-28**	Update to Dose Reduction in Interventional Suite	Ms.Sujitha B.Sc Rit 3RD Year Dr. Jeyasekharan Hospital Nagercoil
10.10 am – 10.20 am	**S-29**	Myocardial Perfusion Imaging In PET	R.Shinduja, Bsc, Rit (3rd Year), Trichy SRM Medical College And Hospital

10.20 am – 10.30 am	**S-30**	Role Of MRI In Assessment Of Valvular Heart Diseases	Dharshan Rajeev College of Allied Health Sciences.Hassan, Karnataka.
		Session 7	
10.35 am - 10.45 am	**P-14**	MR parametric knowledge for optimizing and troubleshooting – Image Quality based approach	Karthik.S , Lecturer/ Incharge BGS GIMS , Bangalore
10.45 am - 10.55 am	**P-15**	Mr Spectroscopy	M Mahalakshmi, Senior Radiographer TNMSC – Govt Omandur Medical College Chennai
10.55 am - 11.05 am	**P-16**	Breast MRI	Volimathi T , Lecturer , Saveetha College Of Allied Health Sciences
11.05 am – 11.15 am	**P-17**	MR Perfusion	Kayalvizhi R , Assistant Professor KS Hegde Medical Academy Nitte
11.15 am – 11.25 am	**P-18**	Artificial intelligence in medical imaging	Jonsi Johnson , Lecturer Dr. Jeyasekharan Medical Trust, Nagercoil, Kanyakumari.
Session 8			
11.30 am - 12.00 noon	**G-5**	Breast Compression in Mammography: Past and Present	Mr. Shashi kumar Shetty , NITTE , Mangalore
12.00 am - 12.20 pm	**G-6**	Conventional Radiography Techniques for Acute Abdominal Pain	Mr.C.Marimuthu , KMC&H , Chennai
12.20 pm - 12.40 am	**G-7**	Perspective MR imaging sequence for Technologist	Mr.Jerald , PSG Hospital , Coimbatore
12.40 pm - 01.00 pm	**G-8**	Scope of Radiology in Abroad – Basic criteria to know	Mr.RishiMurugesh , Omandurar Hospital , Chennai
01.00 pm – 01.20 pm	**G-9**	Care of Patients – Intelligent Imaging in Digital Era	Mr.A.P.Berry , Neyoor
1.30pm – 02.30pm	**LUNCH**		
02.30 pm – 02.40 pm	**P-19**	Vessel Wall Imaging in Cerebrovascular Diseases	Akila R , SIMS , Vadapalani
02.40 pm – 02.50 pm	**P-20**	Gadolinium neurotoxicity -Case study	ARUL.S Assistant Professor. Acharya institute of allied health sciences
02.50 pm – 03.00 pm	**P-21**	Consideration Of Patient Safety In Contrast Medium	Sherin percy v , Assist. Professor Vinayaka mission research foundation-Salem
03.00 pm – 03.10 pm	**P-22**	MRI Sleep Study	M.vinothraj , Radiation Technologist Govt Kasturba gandhi hospital for women and children
03.10 pm – 03.20 pm	**P-23**	Significance Of Mr Perfusion And Mr Spectroscopy In Characterisation Of Breast Masses On Mr Mammography With Hpe Correlation	Akshhaya B , , Lecturer Meenakshi Academy of Higher Education & Research, Kanchipuram
03.20 pm – 03.30 pm	**P-24**	Efficacy Of Proton Density Fat Fraction In Non-Alcoholic Fatty Liver Disease	Sruthi K , Imaging Specialist Icon Clinical Research, Chennai
03.30 pm – 04.00 pm	**VALEDICTORY FUNCTION**		

Problem based learning (PBL) and its effectiveness in teaching and learning Equipment operation and maintenance for radiography students.

Tamijeselvan S

Asst. Professor in Radiography, Mother Theresa PG and Research Institute of Health Sciences, Puducherry, Indira Nagar, Puducherry.605006.

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Introduction: Problem Based Learning is an approach to learning and instruction in which students handle problems in small groups under the supervision of a faculty. These phenomena have to be explained by the tutorial group in terms of their underlying principles, mechanism and processes. This style of learning is assumed to foster of knowledge increase, improve students general problem solving skills, foster the development of self-directed learning skills, and strengthen students intrinsic motivation.

Materials and Methods: A randomized controlled design was used for the study to test the addition of Problem Based Learning to theory lectures and clinical experience versus theory and clinical experience alone on student's knowledge in operating and maintenance of radiography equipments. The students were randomly selected and then randomly distributed either to experimental or control group. The knowledge is accessed by valid questionnaire through the pretest and post-test for both the experimental and control group. The data are then analyzed by excel work sheet to get the result.

Summary and Results: Sixty radiography students from third semester were randomly assigned either to the experimental or control group, so that there were 30 students in each. The experimental group got classroom lectures, a clinical course at the hospital, and PBL scenarios for select the proper image receptor, grid and other accessories, manipulate the image receptor as appropriate for accurate imaging, select optimum technique, identify and rectify the minor faults and able to do Quality Assurance programme. The control group, on the other hand, attended hospital lectures and clinical training in the above without PBL scenarios. The mean score for the pretest and posttest score are at 21.67 and 34.04 for experimental group with a standard deviation 4.44 and 3.44 respectively while it was 21.80 and 29.07 for the control group with a standard deviation of 3.88 and 3.85 respectively.

Conclusion: This study shows that students' knowledge in operating and maintenance of radiography equipments significantly enhanced after the implementation of Problem based learning(PBL) module.

CRYOABLATION

H.C.YOGANANDA, Technical Officer, Radiation Safety Officer
Department of Radio-Diagnosis, Tata Memorial Hospital, Parel, Mumbai
(Vice-President of ISRT, India)

INTRODUCTION: Cryoablation is also called Cryotherapy, Cryosurgery is a process of rapidly freezing tissue by exposing it to intensity low temperatures. Cryosurgery works by taking advantage of destructive force of freezing temperature on cells causes complete destroy dissed tissue like cancer cells.

HISTORY:

- 1917 –De quervain carbon dioxide snow used to treat cancer bladder
- 1961 - Cooper and Lee introduced the first automated cryosurgical apparatus cooled by circulating liquid nitrogen.
- 1964- Dr.Cahan successfully used liquid nitrogen probe to treat CA cervix
- 1968-Dr.Tanaka cry ablation tech used to treat metastatic breast cancer
- Later development in radiological imaging and development in cry therapy technique. CT, MRI, Ultrasound guided cryoprobes are now available which improved the capability of cryoablation in various disease.

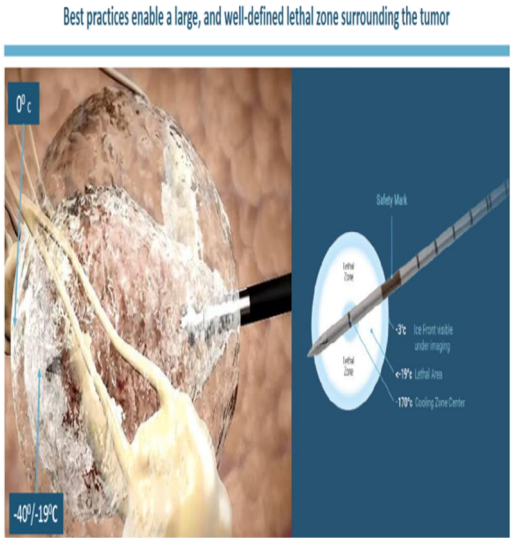
Cryoablation can be performed in different ways:

- Topically –On the surface of skin.
- Percutaneous – Inside your body through a small puncture / hole under image guidance
- Surgically –Inside the body through a large / open incision.

WORKING PRINCIPLE:

Cryoablation/Cryotherapy using argon gas form to creat extremely cold temperature to form ice from cryoprobe using this principle known as the

Joule Thomson effect.this gives physicians excellent control of the ice and minimizing complications using thin cryoneedles.cryoablation is a process that uses extreme cold that is -140°c to destroy tissue.it is performed using hollow needles (cryoprobes) through which cryogens are circulated.



- Healthy and diseased tissue cannot withstand extremely cold condition and will die
- Ice formation in the fluid outside cells, which results in cellular dehydration.
- Ice formation within the cell. At approximately -40°C or less, intracellular lethal ice crystals begin to form & will destroy almost any cell.
- Bursting from both swelling caused by ice expansion inside the cell or shrinking caused bywater exiting thecell.
- Loss of blood supply by small vessel occlusion.
- Cells die when their blood supplyis stopped by ice forming within small tumor blood vessels, causing clotting.

- Complete Freeze-Thaw-Freeze Cycle for single ablation
- Commonly Performed Cycle is
- 10 minutes Freeze
- 10 Minutes Thaw
- 10 Minutes Freeze
- 3 to 4 minutes Thaw to remove needle from the ice ball
- Complete time for single ablation-40 to 45 minutes

- Less painful.
- Less discomfort
- Day care procedure
- No open wound – no bleeding
- No or minimal scaring
- Without under GA
- Damage to adjacent non targeted tissue is less.
- Rapid treatment
- Can be adjunctive therapy with surgery or radiationtherapy in malignancy
- Safe ,easy toperform

Title: Breast Compression in Mammography: Past and Present

Mr. Shashi Kumar Shetty
Head,Dept of medical Imaging Technology
K S Hegde medical Academy. Nitte (Deemed to be University)
Mangalore, Karnataka

In mammography, breast compression is used to reduce the thickness of the breast. This results in improved image quality because tissue superposition and x-ray scatter are reduced, while it limits the required dose. In addition, with a compression paddle the breast can be kept in a fixed position, which reduces the risk of motion artefacts and image blurring.

Mammography devices measure and display compression force during the imaging procedure. However, there are no quantitative guidelines regarding the compression force a radiographer should apply for acquisition of an adequate mammogram. In practice, compression force in mammography varies widely among radiographers, screening centers, and countries. A disadvantage of compression is that many women complain about discomfort and pain which might influence their participation in screening. A reduction in compression force has therefore been suggested to encourage screening attendance.

Digital breast tomosynthesis (DBT) is replacing standard 2D mammography for cancer screening in many countries. Studies of DBT and its potential to perform breast imaging with reduced breast compression have shown promising results without implementation of special acquisition techniques or image processing. Because DBT reduces the phenomenon of tissue superposition, DBT could be performed with reduced breast compression if the changes in dose and image quality are not clinically significant. Breast cancer screening using DBT without the vigorous compression used in standard 2D mammography would be welcome by women, especially because time under compression is greater with DBT.

While it is widely accepted that firm breast compression is needed to ensure acceptable image quality, guidelines remain vague about how much compression should be applied. For example, the European guideline states that "the breast should be properly compressed, but no more than is necessary to achieve a good image quality". A quantitative parameter indicating the amount of compression is not presented. Consequently, little is known about the relationship between the amount of breast compression and breast cancer detectability. Furthermore, it has been reported that too much compression, as applied during spot compression, can lead to dissolving of suspicious densities in some cases.

This talk includes: past and present techniques in breast compression, advantages and disadvantages of breast compression, comparison of 2D and 3D breast imaging and research in breast compression.

R.JERALD
Sr. Technologist
PSG Hospital, Coimbatore.

This Presentation will provide the Radiologic technologist with a great understanding of the utilization of the Sequence in the MRI Scanner Machine.

Abstract

In Today's Technological Revolution, The adequate knowledge is necessary to diagnose diseases, The technologist's success is dependent upon a broad knowledge base and refind spsychomotor skills, that knowledge must be also included, in the technology adoption, patient care, and time, It just not Imaging, but diagnosis.

The basic Sequences like T1, T2, FLAIR,DWI, DTI ,Fat suppression, Perfusion, MRA ,MRV, Spectroscopy CSF Flow study MR Breast Imaging The relevant sequences for the particular clinical Indication must be adapted to reduce the time and safety of the patients.

The benefits of the sequences, high accuracy of diagnosis, and reduce cost and time duration to a minimum.

In this presentation we will discuss more detail about the sequences in MRI and the role of Radiological technologist in future Practice.

SCOPE OF MEDICAL IMAGING TECHNOLOGY

Dr. Murugesh (Rishi), BOT, M.Sc (Psy), DRDT, MRT

Radiographer/Imaging Technologist,

Govt. Omandurar Medical College, Chennai-2

Medical Imaging Technology has been one of the ever evolving filed in medical fraternity. Imaging Technologist play a pivotal & variety of roles in day-to-day practice in healthcare.

- ❖ Career opportunities in our field are vast for the right person. Vacancies arise very now and then in Ministry of Health of various countries abroad.

Basic Requisite include:

Communication

- ❖ Practical and subjective knowledge:
- ❖ Confidence & Adaptability
- ❖ Attention & Responsibility
- ❖ Decisions quickly and independently

Other Requisite:

- Degree: UG/PG - University - Affiliation
- Transcript - Practical Hours & Theory baseline
- Language: IELTS
- Passport & Identity proofs
- Aptitude exam: HAAD/Biometric
- Good Standing Certificate
- Professional References
- Membership from Academic/Professional associations

CONVENTIONAL RADIOGRAPHY TECHNIQUES FOR ACUTE ABDOMINAL PAIN

C.Marimuthu
Institute of Radio-diagnosis
Govt Kilpauk Medical College Hospital, Chennai -10

Acute abdomen is medical term used to describe a clinical condition of acute onset of abdominal pain. Common causes of acute abdominal pain are perforated ulcer, bowel obstruction, appendicitis and cholecystitis. In many cases it is a medical emergency and some of them need surgical treatment, so appropriate Imaging diagnosis is essential to decide whether surgical interventions are needed or not. The commonly available conventional radiography is the initial choice of imaging. Presence of free air in radiograph is evident of perforated hollow viscus. USG and CT scan are widely used for added information.

Acute abdomen X-Ray series is a set of x-rays to be performed to evaluate the acute abdomen pain.

The series includes

- Abdomen Supine AP
- Abdomen Erect PA (or) Left Lateral Decubitus AP (Or) Dorsal Decubitus Cross Table Lateral
- Chest Erect PA

Major information is attained from supine AP radiography itself. Added information like intraperitoneal free gas or fluid is easily ruled out with abdomen erect (or) Left laterals Decubitus (or) dorsal Decubitus projections. Chest Erect PA projection is useful to show the collection free air under the diaphragm as well as any lesion in chest also, because some of the chest basal lesion's symptoms may mimic as acute abdominal pain. It is wise to take erect position x rays first when the patient comes to the department by walk or in sitting position by wheel chair. If the patient comes to the department by in lying position, erect x rays must be performed after kept the Patient in respective position at least 5- 10 minutes before the exposure to allow the air collected under the diaphragm.

Discography

A Pre-surgical Evaluation

Prof J Venkat
Teaching faculty in Radiography, Global Hospital, Chennai

Definition

Discography has conventionally been performed to localize the “pain generator” disk in patients with history of low back pain (LBP) that has failed conservative treatment. It is almost never used as the first test in the diagnostic work-up of discogenic low back pain. The procedure involves injection of contrast agent into the nucleus pulposus of the disk under image intensifier guidance and assessing patient’s response to contrast injection.

Procedure

When Discography is indicated, it is performed with the patient in prone position. For lumbar spine, the entry point is located by measuring approximately 4 finger-breadths distance from either side of the midline at the desired disk level using fluro guidance.

A coaxial 2-needle oblique extradural approach is used. First, LP needle is introduced at about 45 degrees to the horizon. It is targeted to enter the disk lateral. Once the tip of this needle is just hitched to the annulus, a smaller diameter but longer needle is railroaded through the first needle and inserted into the nucleus of the disk. The contrast agent is injected into the nucleus of the disk slowly, depending upon the resistance with pressure gauge syringe. Usually the pressure is reached 90 to 120 psi

Patient’s response to the contrast injection is assessed by asking the following questions:

- Is there pain? Feeling of sensation of pressure after contrast injection does not equate to pain.
- What is the nature of the pain? Is it similar to the kind of back pain you usually have?
- What is the distribution of pain? Does the provoked pain cover the same area as the usual pain (concordant) or a different one (discordant)?
- What is the intensity of the pain on visual analog scale? (1 to 10 in pain scale). 22

The result is considered positive if the provoked pain is concordant, similar in nature to the usual pain. Required images are recorded to determine disk morphology. The results may be compared against a control (morphologically normal disk on magnetic resonance imaging) disk.

Conclusion

Discography is a useful diagnostic tool in the management of long-standing discogenic back pain that has failed conservative treatment, especially if surgical intervention is indicated. However, careful selection of patients and interpretation of results is vital for the test to be of value in identification of the problem and its management.

P1 - UNDERSTANDING OF RADIATION UNITS AND QUANTITIES

Mr.L.Dhanush M.Sc.,M.Ed.,
Medical Physicist in Sri Sathya Sai Medical College-Chennai

Introduction

A unit is necessary for the measurement of any physical quantity . The international commission on radiation unit and measurement (ICRU) has objective to develop quantities, unit of radiation and radioactivity , procedure for measurement in the application of ionizing radiation in medicine, industry and agriculture. It publishes different reports on the concepts related to quantities and their units in radiation physics and dosimetry. The international commission on radio logical protection(ICRP) is an advisory body providing recommendations and guidance, in the form of reports, on radiation protection for the radiation workers, public and environment against the harmful effects of ionizing radiation. Some of the quantities of interest are activity , air kerma, exposure, absorbed dose , equivalent dose , effective dose. In 1980 the ICRU Recommended SI units for the above Quantities. Radiation dosimetry has its origin in the medical application of ionizing radiation starting with the Discovery of X-Ray by Roentgen in 1895

Method:

Discussion of Radiation Quantities and Unit with images

- Radioactivity
- Specific activity
- Exposure
- Kerma
- Absorbed Dose
- Charged particle Equilibrium
- Equivalent Dose
- Effective Dose
- Collective Dose
- Committed Dose
- Collective Effective Dose

Summary

Dosimetric Quantities are useful to know the potential hazard from radiation and to determine radiation protection measures to be taken . The Old,Non-SI quantities and units are mentioned since are still used in some countries

Quantity	Equation	Medium	Type of Radiation	SI Unit	Classical Unit	Relation
Activity	A= dN/dt	Any Medium	Any Radiation	Bq (dps)	Ci	1Ci= 3.7x10^10Bq
Absorbed Dose	D= dE/dm	Any medium	Gy(J/Kg)	Gy (J/Kg)	Rad= 100ergs/g	1Gy= 100Rad
Equivalent Dose	H= $D \times W_R$	Living Tissue	Radiation dependent	Sv	Rem	`1Sv= 100Rem
Effective Dose	E= $H \times W_T$	Whole body		Sv	Rem	1Sv= 100rem
Collective effective Dose	S= EiNi			Man-Sv	rem	
Exposure	X= dQ/dm	Air	X, gamma	C/Kg	Roentgen	1R= 2.58x10^-4C/Kg

P2 - MULTIPARAMETRIC APPROACH TO RADIATION DOSE REDUCTION STRATEGY IN CT HEAD OBTAINED ON DIFFERENT CT SCANNERS INSTALLED IN THE DEPARTMENT OF RADIO-DIAGNOSIS AND IMAGING AT P.G.I.M.E.R., CHANDIGARH – A CATPHAN 500 PHANTOM STUDY

Aditya Nagrath.

Dept of Radiology, PGIMER, Chandigargh.

AIM

To find ways of dose reduction while maintaining image quality of CT Head obtained on different CT scanners installed in the Department of Radio-diagnosis and Imaging, P.G.I.M.E.R., Chandigarh with the help of CATPHAN 500 phantom.

INTRODUCTION

1. Radiation dose in CT can be quantified in a variety of ways. Scanner radiation output, organ dose and effective dose are several of the more common dose metrics. The scanner radiation output is currently represented by the volume CT dose index ($CTDI_{vol}$), which describes the radiation output of the scanner in a very standardized way.

2. The goal of dose reduction can be approached from the following two perspectives. The first perspective is to appropriately define the target image quality for each specific diagnostic task, not requiring lower noise or higher spatial resolution than necessary.

3. The second perspective on dose reduction is to improve some aspects of image quality, such as reducing image noise, which can then be implemented in order to allow radiation dose reduction. This task can be accomplished by optimizing the CT system and scanning techniques, and improving the image reconstruction and data processing.

4. Quality Assurance means the planned and systematic actions that provide adequate confidence that a diagnostic x-ray facility will produce consistently high quality images with minimum exposure to the patient.

5. Quality Control comprises the qualitative and quantitative measurement or test performance of an instrument or program and the determination of adequacy and acceptability of performance.

6. Basic elements of a CT Quality Control program are: QA Program manual, QC tests, evaluation and keeping the records under the guidance of QA team and the medical physicist.

Various parameters of Computed Tomography tested in this study include the following:

1. CT number linearity
2. Noise and uniformity
3. High contrast resolution
4. Low contrast resolution
5. Slice thickness

MATERIALS AND METHODS

This study will comprise the testing of various image quality parameters and dose reduction strategies of different CT scanners in the Department of Radio-diagnosis and Imaging, P.G.I.M.E.R., Chandigarh with the help of CATPHAN 500 phantom.

The CT scanners to be tested in this study are as follows:

NAME OF MACHINE	**LOCATION**
Philips iCT 256	Nehru Hospital, PGI, Chandigarh
Siemens Somatom Definition Flash	Nehru Hospital, PGI, Chandigarh
Siemens Artis Q	Nehru Hospital, PGI, Chandigarh
Siemens Somatom Definition AS	Emergency Section, PGI, Chandigarh

The following parameters will be varied to obtain axial images of the phantom:

- mAs
- kVp
- Pitch
- Reconstruction method

The different modules of the CATPHAN 500 phantom which will be evaluated in this study are:

1.	CTP401	Wire ramps
2.	CTP 528	21 line pair high resolution and point source
3.	CTP 515	Subslice and supraslice low contrast
4.	CTP 486	Solid image uniformity module

RESULTS

This study will analyze the different dose reduction strategies while maintaining various parameters of image quality in Computed Tomography.

CONCLUSION

Dose reduction and Image quality play an important role in Computed Tomography. It is essential to maintain the accuracy and reproducibility as it affects the proper diagnosis and patient care delivery.

P3 - ESTIMATION OF RADIATION DOSE TO THYROID AND GONADS DURING CT THORAX EXAMINATION

Jaseemudheen MM,

Assistant Professor, Department of Radiodiagnosis and Imaging,

KS Hegde Medical Academy, Nitte Deemed to be University

Abstract:

Radiological examination utilizing x-rays remains the most frequently used ionizing radiation in medicine, constituting the most significant artificial source of radiation exposure to the world population. In diagnostic radiology, periodic dose assessments are carried out to encourage the optimization of the radiation protection of patients. Dose measurements are required in every hospital to ensure compliance with the acceptance dose limit. During the past two decades, several radiation dose surveys have been undertaken in many countries around the world. One of the outcomes of these efforts was the recognition of significant variations in patient doses between different radiological departments for the same type of examination. These variations in dose within and among hospitals justify dose assessment in order to optimize the diagnostic radiology practice. The current cross-sectional study was performed in the department of radiodiagnosis and imaging, K S Hegde medical academy, Nitte deemed to be University, after obtaining Central ethical committee clearance (NU/CEC/2020/12). The study involved 43 participants, which include 22 males and 21 females from 18 to 70 years of age referred for CT Thorax examination. This study drives to estimate the radiation dose to the thyroid and gonadal region during CT thorax examination and to compare gender-related variations in received radiation dose. This study also helps to analyze the correlation between BMI and DLP. The radiation dose was detected by keeping TLD chips which are kept in the lower part of the neck and the pelvic region.

P4 - INTRODUCTION TO THE CONCEPT OF RADIOACTIVITY AND MODES OF RADIOACTIVE DECAY

M. Jayalakshmi Ezhilvizhian

External Faculty Department of Radiology and Imaging Sciences

Aarthi Scans Pvt Ltd, Chennai,Tamilnadu

RADIOACTIVITY, also known as radioactive decay is a spontaneous process by which an unstable parent nucleus emits a particle and transforms into a daughter nucleu that may be stable or unstable. The unstable daughter nucleus will decay further in a decay series until a stable nuclear configuration is reached. Radioactive decay is usually accompanied by emission of energetic particles.

MODES OF RADIOACTIVE DECAY :

Radionuclides may decay by any one or a combination of the following process.

• **Spontaneous Fission** - Fission is a process in which a heavy nucleus breaks down into two fragments and is accompanied by the emission of two or three neutrons with a mean energy of 1.5MeV and a release of nearly 200MeV energy,which appears mostly as heat.

The probability of spontaneous fission is low and increases with mass number of the heavy nuclei.

• **Alpha Decay** – Heavy nuclei like radon,uranium decay by alpha particle emission.

Helium is the alpha particle and the atomic number of the parent nuclide is reduced by 2 and the

mass number by 4.

Example **:** $U^{235}92 = Th^{231}_{90} + {}^{4}_{2}\alpha^{2}$

• **Beta Decay (β^-)** – Neutron rich nucleus decays by beta particlel emission along with an antineutrino and in beta decay a neutron (n) decays into a proton (p) and a beta particle.

$$n \; p+\beta+\bar{\nu}$$

Example : $I^{131}_{53}\ Xe^{131}_{54} + \beta+\nu$

• **Positron or Beta Decay (β^+)** - Proton rich nucleus decays by (β^+) particle emission along with an neutrino and in positron decay, a proton (p) transforms into a neutron (n) by emiting β^+particle.

$$p \; n+\beta+\nu$$

Example $^{64}_{29}Cu\ ^{64}_{28}Ni + \beta^+ + \nu$

- **Electron capture** – Alternative to positron decay.Electron is captured from the extranuclear electron shells and it transforms a proton into a neutron and emits the neutrino .The atomic number of the parent nucleus is reduced by 1.

Example $^{67}_{31}Ga + e^{67}_{30}Zn + v$

• Gamma decay and Internal conversion –

ISOMERIC TRANSITION – Alpha decay and the other beta decay modes may produce a daughter nucleus in an excited state (isomeric states) and finally reaches the ground state with a lifetime of pico seconds to many years (Isomeric transition) through one of the following process: 1.By emiting the excitation energy in the form of one or more gamma photons. 2. By transferring the excitation energy to the orbital electrons through **INTERNAL CONVERSION**.

P5 - PET/MRI SYSTEM DESIGN

Mr.T.Manojkumar , Medical Physicist

Assistant Professor KG Hospital , Coimbatore

The combination of clinical MR and PET scanners has received increasing attention in recent years. In contrast to currently used PET/CT machines, PET/MR offers not only improved soft-tissue contrast and reduced ionizing radiation(nearly 10mSv for whole body CT) but also a wealth of available MR variations such as functional, spectroscopic, and diffusion tensor imaging. This combination, however, has proven to be very challenging, due to the harmful effect of the scanners on each other's performance. Significant progress has been made in the last 10 years to solve the various technical issues, point of highest development with the recent release of clinical whole-body hybrid scanners.

In this presentation, we review the technological challenges of PET/MR design, briefly describing the different available architectures for hybrid clinical scanners, their capabilities, and limitations.

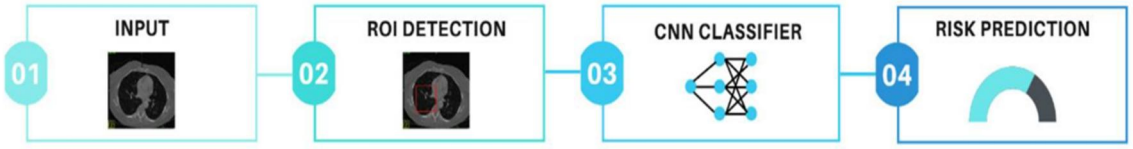
P6 - ARTIFICIAL INTELLIGENCE BASED DISEASE DIAGNOSIS AND TREATMENT OF CANCER IN HEALTHCARE

Dr. C. Senthamil Selvan

Lecturer cum RSO, Department of Radio-Diagnosis,

Mahatma Gandhi Medical College and Research Institute, Puducherry-607402.

The recent global mark analysis report shows AI in healthcare valued at $ 10.4 billion in 2021 is expected to expand AI growth rate by 38.4 % from 2022 to 2030. Human-developed mathematical algorithms stimulate the human intelligence processes by computer systems to diagnose diseases and treat patients in the hospital. Nowadays, humans are affected by different types of diseases which should be treated more accurately and with precision. This review aims to provide an overview of current artificial intelligence-based diagnosis and treatment. Machine learning is a subset of AI it helps to find the solution for big problems. Deep learning is a subset of machine learning it helps to train the model. Three layers are important which are the input layer, hidden layers, and the output layer. The different type of algorithms used in DL is CNNs, LSTMs, RNNs, GANs, RBFNs, MLPs, SOMs, DBNs, RBMs, Autoencoders, etc…



In this survey, we give a review of the recent artificial intelligence algorithm-based diagnosis and treatment of cancer disease. This review can help young researchers who are involving AI relevant research studies to understand the algorithm concepts and adapt the AI for medical imaging and treatment in healthcare.

References:

- Artificial Intelligence In Healthcare Market Size, Share, And Trends Analysis Report By Component (Software Solutions, Hardware, Services), By Application (Virtual Assistants, Connected Machines), By Region, And Segment Forecasts, 2022 – 2030 (Report ID: GVR-3-68038-951-7).
- Benjamin Hunter et. al., The Role of Artificial Intelligence in Early Cancer Diagnosis Cancers (Basel). 2022 Mar; 14(6): 1524. (doi: 10.3390/cancers14061524)

P7 - CLASSIFACTION OF NON-SMALL CELL LUNG CANCER USING CT THORAX BASED RADIOMIC FEATURES

Ms.Aishwarya ,

Lecturer , Dr.Jeyasekharan Medical Trust , Nagercoil. Tamilnadu

Objective: Purpose of this study to investigate the efficacy and usefulness of using Radiomics features based on CT thorax in classification of non-small cell lung cancer.

Materials and method: A total of 75 patients with non small cell lung cancer who underwent CT thorax. A total of 102 radiomic features including GLCM, shape based and texture based were extracted from 3D slicer. 3D slicer is used to label the images from CT sections of thorax where the lesion is present. The ROI's will be drawn from the areas of Nodule/tumor region. The 3D slicer is used to extract the radiomic features from tumor /nodules. The extracted features will be further analyzed and classified. Representation of box plot showed the difference between adenocarcinoma and squamous cell carcinoma.

Result: investigated 102 characteristics extracted from contrast-enhanced CT thorax images in this study and discovered that some showed a substantial difference between adenocarcinoma and squamous cell carcinoma.

Conclusion: study showed that high dimension imaging features such as radiomics extracted from CT Thorax would help in differentiating the Non-Small cell lung cancer.

P8 - FLUOROSCOPIC RESCUE OF FAILED ENDOSCOPIC STENT PLACEMENT FOR OBSTRUCTING COLORECTAL MALIGNANCY- AN ALTERNATIVE TECHNIQUE

MR.VAYSHAK K.V

LECTURER

A.C.S MEDICAL COLLEGE AND HOSPITAL

Dr. M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE, CHENNAI.

INTRODUCTION

Malignant colorectal obstruction is a medical emergency requiring rapid bowel decompression. Although emergency surgery is the primary treatment, it is associated with high mortality and morbidity.

Many patients are not eligible for surgery because of disease extent and severe cardiopulmonary comorbidities, but the self-expandable metal stent (SEMS) has been successfully used as a nonsurgical alternative for palliation of advanced disease and preoperative bowel decompression.

Colorectal stenting is mainly performed under endoscopic guidance with a high success rate and a low complication rate .However, in some patients, endoscopic stent placement can be challenging because of acute angulation, complete obstruction, or in-adequate preparation of the colon

In patients with failed endoscopic SEMS placement, the fluoroscopic approach might be an effective alternative.

WHY FLUOROSCOPIC SEMS PLACEMENT ?

Fluoroscopic SEMS placement is not affected by bowel preparation status and allows definition of the whole length and geometry of the obstruction using contrast media. It also allows use of catheters and guide wires with variable head shapes, which is especially helpful in cases with complete or acutely angled obstruction.

PROCEDURE

1. Each patient under-went CT before SEMS placement to evaluate the extent of the tumour and to assess the site, degree, and length of the obstruction. Bowel preparation was not perform
2. The patients were placed in the left lateral decubitus position. Sedation and analgesia Sedation and analgesia were obtained by administering 50–75mg of pethidine hydrochloride and 2–5mg of midazolam IV with continuous monitoring of the heart rate, blood pressure, and oxygen saturation.

STENT PLACEMENT

3. A 5-French angiographic catheter and hydrophilic guide wire were introduced through the anus and manipulated to approach the obstruction.
4. A contrast medium and room air were injected through the catheter during the procedure to distend and outline the colon. If there was difficulty in advancement of catheters due to
5. Tortuous or redundant colon, various support devices 8-French guiding catheters, multifunctional coil catheter and 6-mm or 8-mm guiding sheath were used as needed to straighten the tortuous colon or prevent prolapse of the catheter into the redundant colon.
6. The obstruction was negotiated and passed using 5-French angiographic catheters with variable head shapes and 260-cm-long, 0.035-inch-diameter (0.889 mm) hydrophilic guide wires.
7. Once the catheter and guide wire combination was passed through the obstruction, a small amount of contrast medium was injected to determine the length and geometry of the obstruction.
8. Then, the guidewire was replaced with a 260-cm-long or 400-cm-long stiff wire, depending on distance from the anus to the obstruction.
9. Stent length was chosen to cover at least an extra 2 cm on each side of the obstruction. *For example, if the stricture length was 4.1–6.0 cm, a 10-mm-long stent was used.*
10. For long segmental obstruction of more than 8 cm, two or more overlapping stents were placed.
11. In patients with multiple obstructions, stents were placed for all obstructions in a single session.
12. If the obstruction did not allow advancement of the stent delivery system, balloon dilation (10mm) was performed before stent placement.
13. Balloon dilation (14 or 16 mm) was performed after stent placement if the stent expanded less than 25% of its nominal diameter with disturbance of contrast-medium passage.

POST STENT PLACEMENT

After SEMS placement, patients were observed for defecation and alleviation of obstructive symptoms. Daily abdominal radiographs were taken to monitor bowel decompression and exclude stent migration and bowel perforation.

If patients failed to defecate for 3 days after the initial procedure, they underwent catheterdirected colon study for possible reintervention. If the obstructive symptoms did not improve for 7 days after initial stent placement, contrast-enhanced CT was performed to reveal the cause of persistent symptoms.

After discharge, patient progress was monitored by follow-up at an outpatient clinic every 3 months. Contrast-enhanced CT was performed at 3-month intervals or if recurrent obstruction was suspected. Patients with recurrent colorectal obstruction during follow-up underwent additional stent placement or bypass surgery

COMPLICATION

A major complication was defined as an event that needed a specific therapy, an increased level of care, prolonged care, prolonged hospital stays, permanent adverse sequelae, or death. All other complications were considered minor.

ANALYSIS

Technical success was defined as a successful deployment of SEMS covering the whole obstructed segment regardless of requirement of reintervention. Clinic al success was defined as relief of obstructive symptoms with-in 3 days after initial stent placement or reintervention.

CONCLUSION

Fluoroscopic colorectal SEMS placement is technically feasible and clinically effective in most patients with failed endoscopic procedure. Therefore, fluoroscopic treatment is a valid alternative if an endoscopic procedure is technically difficult.

P9 - EVOLUTION IN COMPUTED TOMOGRAPHY

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Introduction:

The advent of computed tomography (CT) has revolutionized radiology. Starting as head-only scanners, modern CT systems are now capable of performing whole-body examinations within a couple of seconds in isotropic resolution.

History:

Godfrey Hounsfield, a British electrical engineer at EMI, and Alan MacLeod Cormack, a South African–born physicist were jointly awarded the Nobel Prize in Medicine in 1979 for their contributions to developing computed tomography.

Generations of CT:

First Generation : Translate-rotate

Second Generation : Translate-rotate

Third Generation : Rotate-Rotate

Fourth Generation : Rotate-Fixed

Fifth Generation : Stationary-Stationary

Helical CT & Multi Detector CT.

Gantry Technology:

The introduction of slip-ring technology for the transport of data and energy to and from the gantry enabled continuous rotation of x-ray tube and detector. This was an essential prerequisite for the development of spiral CT scanners. Most recent CT systems with gantry rotation times down to 0.25 s use noncontact data and energy transfer between the rotating and stationary parts of the gantry and some of them even friction-free air bearings.

Detector Technology:

Since the late 1990s, CT detectors are indirect converters, where the x-ray energy is first converted into visible light, which then is captured by a photodiode and converted into an electric current. Currently Photon-counting detectors with energy discrimination capabilities based on pulse height analysis to gather spectral x-ray information without the need to apply to

different x-ray tube voltages. These detectors are expected to improve tissue contrast and reduce image noise.

DOSE REDUCTION TECHNIQUES

Tube Current Modulation/Automatic Exposure Control

Angular tube current modulation (TCM) resulted in 15% to 50% dose reduction, depending on the anatomical region in the x-y plane. Tube current modulation did not only reduce patient exposure but also homogenized noise distribution and therefore improved image quality.

Dynamic Collimators

To minimize the z-over scanning effect, special dynamic collimators have been introduced that asymmetrically open and close at the edges of the scan range.

Low-Kilovolt Scanning

Operating the CT system at low-kilovolt at a fixed tube current minimizes the x-ray exposure of the patient but also increases image noise because fewer photons reach the detectors. In clinical practice, a change of the tube voltage setting requires a simultaneous adjustment of the tube current to keep image quality high.

Fast Scanning:

The scan speed increases with an increased number of detector rows, although in some implementations, not all detector rows are available for spiral scanning.

Image Reconstruction:

Filtered back projection (FBP) has been the reconstruction algorithm of choice during the recent decades. Filtered back projection is an analytical image reconstruction algorithm, that is, an inversion formula for a simplified measurement model.

Conclusion:

CT has celebrated an amazing comeback within the past decade. Computed tomography is the workhorse in daily practice, spreading into new applications like cardiac and quantitative imaging, and shifting indications from radiography to CT with major clinical impact.

P10 - CT ANGIOGRAPHY(CTA)

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Based on the data acquired by multidetector-row CT (MDCT) is an established, minimally invasive modality for imaging peripheral arteries. CTA has been used to assess peripheral arterial disease before treatment, and it has replaced conventional angiography for the diagnostic evaluation of peripheral arteries. MDCT can optimize both the long scan length and spatial resolution. CTA using MDCT depicts the fine structures of vessels. Recently, automated CTA analysis software has been developed for measurement of the vascular lumen. The software can automatically measure the diameters of short axial sections at the post-processing workstation. Measurement of the vascular lumen is useful in the planning of intravascular treatment for peripheral arterial disease. CTA is also utilized in assessing the intravascular lumen after metallic stent placement.

P11 - CT GUIDED INTERVENTIONS

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INTRODUCTION

- Interventional radiology is a branch of radiology which involves the minimally invasive procedures performed under the image guidance.
- Interventional radiology is a safe, less invasive therapy with less recovery time compared with open surgery.

CT GUIDED INTERVENTIONS

- Computed Tomography plays an important role in interventional procedures such as biopsy, abscess drainage, tumor ablation, catheter placement, and orthopedic instrumentation. All these procedures involve precise incremental advancement of a needle or a probe.
- CT is one of the imaging modalities most often used when cross-sectional image guidance is required in percutaneous interventional procedures
- It can be used either as an alternative to sonography or fluoroscopy or if interventions cannot be done under sonographic or fluoroscopic guidance.
- In general, CT-guided interventions may be divided into diagnostic interventions and therapeutic interventions, although there are overlaps.

DIAGNOSTIC INTERVENTIONS:

- Bone Biopsy
- Soft Tissue Biopsy
- Fine Needle Aspiration For Cytology

THERAPEUTIC INTERVENTIONS:

- Nerve Root block
- Aspiration
- Pigtail Drainage
- Ablation

CT-Guided Interventions - The Technique

All CT-guided procedures involve iterative, incremental advancement of a needle or probe. The patient is positioned on the CT couch and scanned from the control room. The interventional access instrument (e.g., a needle, radiofrequency (RF) ablation probe, or drainage catheter) is introduced and oriented with respect to the lesion in the CT image. The procedure consists of reaching a desired target position in the body, with CT image as the only feedback for confirming the position.

Any CT-guided procedure can be divided into four steps.

1. Trajectory Planning
2. Needle Placement
3. Needle Orientation & Insertion
4. Sampling / Ablation

In the trajectory planning stage, the access route for the instrument is decided based on prior imaging and a current scan. A needle or a probe is then placed on the patient. In the third step, the needle/probe is oriented and inserted towards the lesion. Finally, a sample is taken; the lesion is sampled or ablated, or a catheter is deployed depending on the procedure being conducted.

RECENT TRENDS AND ADVANCED APPLICATIONS

- C-Arm CT for Interventional Procedures
- Robot-Assisted, Image-Guided Interventions
- Intra-Procedural 4D Visualization

CONCLUSION

- CT offers the possibility to safely guide interventions. However, the radiation exposure during CT guided intervention has to be mentioned and every procedure should be performed in a dose-saving manner
- Most importantly, knowledge of anatomy and accurate planning of the procedure are mandatory to avoid complications

P12 - CT IMAGING OF ACUTE ABDOMEN- A PRACTICAL APPROACH

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Introduction:

Acute abdominal pain is a common chief complaint in patients examined reporting to emergency department.

In order to decrease the mortality and morbidity rate, an efficient and correct diagnosis should be given for these patients. When investigations, like USG examinations are inconclusive, in such cases, Computer tomography is a widely accepted primary investigation of choice in patients coming with intense abdominal pain

Technique

- The CT technique used to examine patients with acute abdominal pain generally involves scanning of abdomen from above level of diaphragm to femur neck with use of intravenous iodinated contrast medium.
- Although abdominal CT can be performed without contrast medium, the intravenous administration of contrast material facilitates good accuracy.
- A correct diagnosis significantly decreases morbidity and mortality.

Acute Appendicitis

- Acute appendicitis is the most common abdominal surgical emergency.
- Although the correct diagnosis can be made in most patients on the basis of history,physical examination, and laboratory tests, diagnosis is uncertain in 20–33% of patients who present with atypical symptoms
- CT findings of acute appendicitis reflect the extent and severity of inflammation- **Appendicular dilatation-**the arrowhead sign ofappendicitis

Diverticulitis

- Diverticulitis occurs in 10–25% of patientswith known diverticulosis. The role of CT in these patients is to confirm the diagnosis, establish the presence of complications (e.g., abscess), provide a “road map” for percutaneous or surgical therapy, and suggest alternative diagnoses for patients
- CT findings of divertivulitis is **rounded paracolic outpouching centered in the paracolic inflammation.**

Bowel Obstruction

- Small- and large-bowel obstruction accounts for approximately 20% of acute abdominal surgical conditions
- CT is most helpful in patients with internal and external hernias, neoplasms, gallstone ,ileus, various forms of enteroenteric intussusceptions
- The CT findings of bowel obstruction is the **Dilated cecum-whirl sign , Distended colon and dilated loops u shaped**

Peptic ulcer disease

- Patients with peptic ulcer disease often present with nonlocalizing signs and symptoms indistinguishable from those of acute pancreatitis or cholecystitis.
- **The most common CT finding is focal mural thickening.**

Intestinal Ischemia

- Vascular insufficiency of the gut is a differentialdiagnosis for elderly patients with acute abdominal pain or for any patient with a history of coronary artery disease, peripheral vascular disease, arteritis, hypotension, dehydration, or cardiacdecompensation.
- **Mural thickening of the gut is the most common finding**, and the wall may have a target or halo appearance caused by submucosal edema.

Perforation

- Gastrointestinal perforation usually indicates a catastrophic complication of peptic ulcer disease, diverticulitis, severe intestinal inflammation,infarction, trauma, neoplasm, or closed-loop obstruction.
- Detection of the site of perforation is often difficult but can be assisted by the oral and IV administration of contrast material.
- **Loculated fluid and gas, focal mesenteric oromental infiltration, and focal enhancement of the parietal peritoneum** can help pinpoint the site of perforation.

Acute Cholecystitis

Although sonography is the preferred method for diagnosing acute cholecystitis, CT is frequently the initial examination because the diagnosis is unclear. The most sensitive helical CT findings of acute cholecystitis are **mural thickening greater than 3 mm cholelithiasis (fluid collection)**

Pancreatitis

- Helical CT plays a vital role in the clinical treatment and staging of patients with acute pancreatitis.
- CT can reveal hemorrhage or necrosis in the pancreas and identify the extension of inflammation in adjacent organs.
- CT findings of acute pancreatitis reflect **edema of the gland and surrounding fat i.e non-enhancing low attenuation**

Abdominal Hemorrhage

- Acute hemorrhage in the gut, mesenteries, omenta, retroperitoneum, or abdominal musculature can cause acute abdomen
- First, unenhanced scans should be obtained to detect hyperdense hematoma. IV contrast material delivered at a high rate (4 ml/sec) may identify an active site of hemorrhage and provide a useful guide for subsequent angiographic embolization

Aortic Aneurysm Rupture (Dissection)

- Helical CT is the imaging procedure of choice in patients with suspected aneurysm dissection and rupture
- **The high attenuation crescent sign, attributed to hemorrhage in mural thrombus or in the wall of the aneurysm,** which may be the first sign of aneurysm rupture

Conclusion

Radiological assessment has a main role in diagnosis and treatment of acute abdomen presented from emergency department. CT proved to be a better imaging modality with high sensitivity and specificity in diagnosis.(The sensitivity of CT is 96% in acute abdomen) Awareness of these limiting factors is vital to both clinicians and radiologists in the diagnosis and management of these patients.

P13 - CT TRANSCATHETER AORTIC VALVE IMPLANTATION PROTOCOL (TAVI/TAVR/TMVR)

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INTRODUCTION

The Transcatheter aortic valve implantation or TAVI planning CT protocol is used to plan for transcatheter aortic valve implantation. CT allows for the assessment of the aortic root and valve annulus in order to select an appropriate valve size and location-specific to the patient. An aortic angiogram is also performed in order to determine the suitability of iliofemoral access.

INDICATIONS

The main indication for TAVI CT is severe aortic stenosis. This can present as:

- Rapid or irregular heartbeat
- Chest pain
- Shortness of breath
- Heart palpitations

PURPOSE

The purpose of TAVI CT is to demonstrate the aortic valve filled with contrast without motion or step artefacts. The origins of the coronary arteries and entire aorta down to the femoral arteries should be opacified to allow for planning and measurements to be made.

This examination requires patients to maintain long breath holds and follow breathing instructions. A stable and heart rate of around 60 bpm is ideal for capturing a motionless aortic valve.

TECHNICAL REQUIREMENTS

The minimal technical requirements for TAVI CT are: 64-slice scanner, detector element width ≤0.625 mm, option of cardiac CT and ECG-gated triggering.

PATIENT PREPARATION

- Patients should take their cardiac medications as usual and instructions given on how to breath
- No food 3-4 hours before the scan and no caffeine for 12 hours
- Electrocardiogram signal need to be acquired

TECHNIQUE

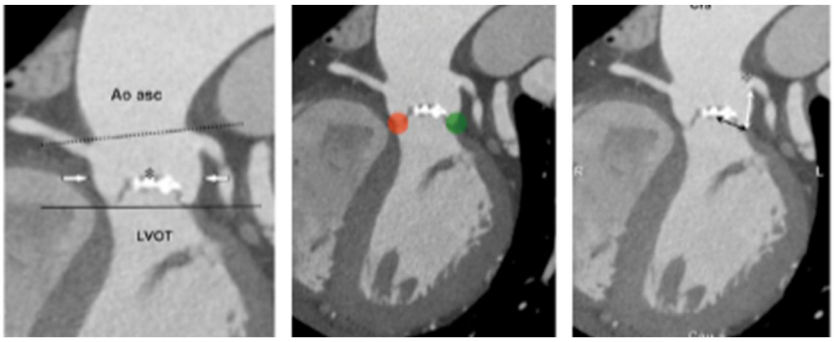
- Patient position - supine with both arms above their head (as comfortable as possible) & ECG
- placement.

- Scout- aortic arch to femoral arteries.
- Scan range
    - calcium score to include valve only
    - TAVI to include the entire heart
    - Aortogram to include aortic arch to the femoral arteries
- Scan direction - craniocaudal
- Contrast injection considerations
    - contrast agents with high iodine concentrations (270-400 mg iodine/ml)
    - contrast timing- monitoring: ascending aorta, bolus tracking
    - contrast volume - Depends On Patient Weight
- Respiration phase
    - inspiration
    - for breath-hold consistency, a medium-sized breath is easier to reproduce throughout the
    - examination compared to sharp deep breaths
    - if the Aortogram and TAVI scan are performed in one breath-hold, instruct the patient to let
    - their breath out slowly if they run out of breath

TAVI WORK UP

The workup is performed by either the radiographer, cardiologist or both. Measurements are drawn for:

- Valve Plane
- Annulus Diameter
- Annulus Size
- Right Coronary Artery Height
- Left Main Coronary Artery Height
- Left Sinus Height
- Right Sinus Height
- Sinus Of Valsalva Diameter
- Sino tubular Junction Diameter



P14 - MR PARAMETRIC KNOWLEDGE FOR OPTIMIZING AND TROUBLESHOOTING

– IMAGE QUALITY BASED APPROACH

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AIM:

To discuss about various MR Image quality influencing parameters and understanding the hardware, software technologies in troubleshooting and bringing out aesthetic MR Images

IMAGE QUALITY:

The quality of an MR image depends on several factors:

- Spatial resolution and image contrast
- Signal to noise ratio (and contrast to noise ratio)
- Artifacts

An MR exploration is a compromise between scan time and image quality. An MR exploration protocol and its sequence parameters will have to be optimized in function of the organs and pathology

SPATIAL RESOLUTION:

Spatial resolution corresponds to the size of the smallest detectable detail. The smaller the voxels are, the higher the potential spatial resolution will be.

SIGNAL TO NOISE RATIO:

The signal to noise ratio is equal to the ratio of the average signal intensity over the standard deviation of the noise.

The signal to noise ratio depends both on some factors that are beyond the operator's control and on factors that the user can change:

- **Fixed factors : static field** intensity, pulse sequence design, tissue characteristics
- **Factors under the operator's control**
    - RF coil to be used
    - Sequence parameters : voxel size, number of averaging, receiver bandwidth

RF COIL:

The smaller the sensitive volume of a coil, the lower the noise from the adjacent structures of the selected slice plane which it can detect, and the better the signal to noise ratio will be.

SEQUENCE PARAMETER:

VOXEL VOLUME:

The signal comes from the excited protons on the selected slice plane. The number of spins in parallel state in excess is proportional to the static magnetic field intensity. The larger the field intensity is, the higher the excess number of spins in parallel state will be. Thus, the signal intensity varies almost linearly with the main field intensity.

Assuming a uniform proton density, the number of excited spins is proportional to the voxel size and so is the signal intensity. The signal goes up linearly with the voxel size

NUMBER OF EXCITATION:

When the number of excitations for the same slice increases:

- The signal is identical for each measure
- The noise is random and is not the same for each measure

The signal to noise ratio goes up with the square root of the number of excitations.

RECEIVER BANDWIDTH:

The relation between the receiver bandwidth and the strength of the readout gradient is such that:

- a broad bandwidth corresponds to a fast sampling of the MR signal and a high-intensity readout gradient
- a narrow bandwidth corresponds to a slow sampling of the MR signal and a low-intensity readout gradient

Background noise has a constant intensity at all frequencies. Therefore, the larger the receiver bandwidth is, the more noise is recorded.

ARTIFACTS:

Artifacts often corrupt MRI images. These artifacts have many causes and consequences on image appearance. The better you understand how MR images are built, the better you will deal with artifacts.

CONCLUSION:

As a qualified and skilled MR Technologist it is mandatory to have a clear knowledge and skill in tackling the image quality issues.

P15 - MR SPECTROSCOPY

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MR spectroscopy provides measure of brain metabolites. Commonly used is H- (Proton) spectroscopy.

Each metabolites appears at specific PPM and reflects specific cellular and biochemical process.

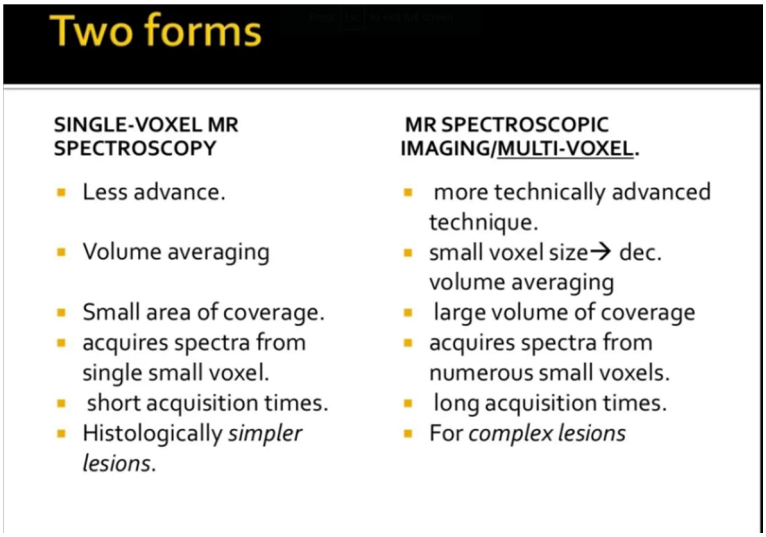
To evaluate brain metabolites, it is necessary to have uniform water and fat suppression and excellent shimming.

There are two forms to perform MRS - Single and multivoxel. Single voxel commonly utilizes small TE (35 ms) and multivoxel utilizes long TE (144 ms) .

Accurate placement of Voxel is imperative to avoid signals from fat (scalp/bone/meninges) and also to place at most enhancing area to avoid necrosis contamination.

Observable Proton Metabolites

ppm	Metabolite	Properties
0.9-1.4	Lipids	Products of brain destruction
1.3	Lactate	Product of anaerobic glycolysis
2.0	NAA	Neuronal marker
2.2-2.4	Glutamine/GABA	Neurotransmitters
3.0	Creatine	Energy metabolism
3.2	Choline	Cell membrane marker
3.5	*myo*-inositol	Glial cell marker, osmolyte hormone receptor mechanisms
1.2	Ethanol	Triplet
1.48	Alanine	Present in meningiomas
3.4&3.8	Glucose	Increased in diabetes
3.8	Mannitol	Rx for increased ICP



MRS Uses:

Along with routine anatomical imaging, MRS helps in monitoring biochemical changes as in Epilepsy, tumor, stroke, metabolic disorder, infection and neurodegenerative conditions.

Clinical Cases and spectra will be discussed during presentation.

P16 - BREAST MRI

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ABSTRACT

Introduction:

MRI of the breast has the highest sensitivity for breast cancer detection among current clinical imaging modalities and is indispensable for breast imaging practice.

Dynamic contrast-enhanced (DCE)-MRI provides information about the morphology and function of a lesion with high sensitivity but moderate specificity (72%) which leads to subsequent patient work-up and biopsies with results that indicate benignity. As a consequence, other MRI sequences, in addition to DCE-MRI images have been introduced in the routine breast MRI exams. This approach has been defined as multiparametric MRI (mpMRI), in which T2-weighted (T2w) MRI is frequently used.

Uses

It is used in, characterisation of lesions, discrimination between benign and malignant breast lesions, preoperative staging, tumour size estimation, detection of the invasive component in DCIS lesions, detection of additional tumour foci in the ipsilateral and contralateral breast, to improve breast cancer surgery

Sequences used

The sequeses are dynamic T1-weighted fat sat gradient-echo before and after IV gadolinium injection, T2W-TSE or STIR sequences ,diffusion-weighted imaging (DWI), further techniques, e.g. proton MR-spectroscopy, seldom applied outside research settings

MRI BI-RADS assessment categories

BIRADS 0: incomplete/non-diagnostic - this category should not be used for marked background parenchymal enhancement (BPE), motion artifacts etc, BIRADS I: negative (no enhancing lesions, no benign changes such as scars, cysts etc.),BIRADS II: benign (lymph nodes, inflamed cysts, fibroadenoma, fat necrosis, foci/stippled enhancement, patchy BPE), BIRADS III: probably benign, requiring short term follow-up in 6 months. If the finding is visible on e.g. US, the most widely available method should be used for follow-up (should be applied only to lesions not fitting category II and IV, probably benign findings in high-risk screening should rather be biopsied than followed-up), BIRADS IV: suspicious finding requiring biopsy (biopsy should always be tried by US first as the majority of MRI lesions can be localised by targeted ultrasound), BIRADS V: highly suspicious, biopsy mandatory, BIRADS VI: known, histologically-verified cancer

Conclusion:

Breast MRI is better than clinical assessment, mammogram, and ultrasound in correlation with pathology. The image resolution of a breast MRI is 10 to 100 times more powerful than a mammogram. Pretreatment MRI should be performed and compared with MRI done after neoadjuvant chemotherapy, this is particularly useful to monitor response to neoadjuvant chemotherapy allowing to identify non-responders early and to delineate the residual tumour after neoadjuvant chemotherapy to determine the appropriate extent of surgical excision. MRI performed in extremely dense breasts has an additional cancer detection of 3.6% in patients with negative mammography.

P17 - MR perfusion

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Introduction:

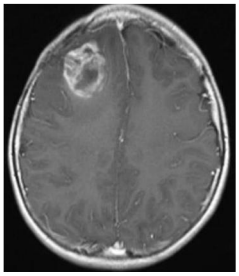
Perfusion is defined as the delivery of blood to an element of tissue. The term "perfusion" is also used to emphasize contact with the tissue or capillary blood flow. There are different techniques - Dynamic Susceptibility Contrast-Enhanced (DSC), Dynamic Contrast-Enhanced (DCE) and Arterial Spin Labelling MR Perfusion (ASL).

Techniques:

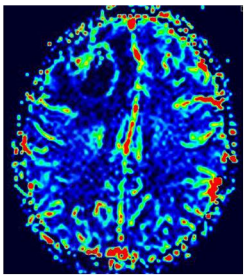
DCE MR perfusion imaging measures T1 changes in tissues over time after bolus administration of gadolinium- based contrast agent. It depicts the wash-in, plateau, and washout contrast kinetics of the tissue, thereby providing insight into the nature of the bulk tissue properties at the microvascular level. The general steps are (in order): perform baseline T1 mapping, acquire DCE MR perfusion images, convert signal intensity data to gadolinium concentration, determine the vascular input function, and perform pharmacokinetic modelling.

DSC MR perfusion measures T2 and T2* changes and is based on the acquisition of serial T1-weighted images before, during, and after administration of extracellular low-molecular-weight MR contrast media. The resulting signal intensity–time curve reflects a composite of tissue perfusion, vessel permeability, and extravascular-extracellular space.

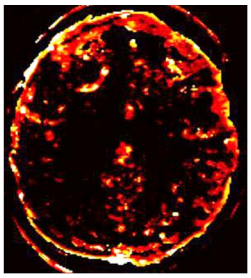
ASL MR perfusion uses magnetically labelled blood as an endogenous tracer. There are two main types of ASL technique: continuous ASL and pulsed ASL. In continuous ASL, there is a prolonged radiofrequency pulse that continuously labels arterial blood water below the imaging slab until a steady state of tissue magnetization is reached. In pulsed ASL, a short radiofrequency pulse is used to label a thick slab of arterial blood at a single point in time and imaging is performed after a period of time to allow distribution in the tissue of interest.



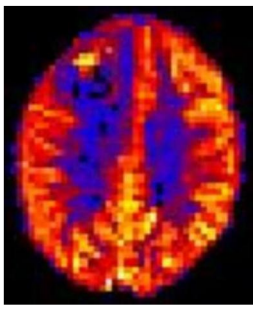
Gadolinium-enhanced T1-weighted image of malignant brain tumor



Dynamic Susceptibility Contrast (DSC) map of cerebral blood volume



Dynamic Contrast Enhanced (DCE) map of transfer constant (*Ktrans*)



Arterial Spin Labeling (ASL) map of cerebral blood flow (CBF)

Indices:

- CBF- Cerebral Blood Flow is the volume of tissue per minute in 100 grams of tissue
- CBV- Cerebral Blood Volume is the volume of a unit of tissue
- MTT- Mean Time Transit is the average time an injected tracer in flowing blood resides within the system
- TTP- Time to Peak
- ktrans- transfer constant

Conclusion:

There are several applications for MR perfusion in identifying the pathology with brain, breast, prostate being the most common. Understanding the different techniques- theory and practical aspects helps technologists be more efficient and decisive in producing MR perfusion images with optimal quality.

P18 - ARTIFICIAL INTELLIGENCE IN MEDICAL IMAGING

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It is a method of evaluating the interior of a body to diagnose, treat and monitor medical conditions. Medical imaging technologies include X-radiography, Computed Tomography, Magnetic Resonance Imaging, Ultrasound, PET, SPECT, and Mammography. Medical imaging aims to maximize the image quality, Minimize radiation dose, and for safe, effective, and accurate diagnosis.

Artificial intelligence:

Artificial intelligence (AI) in medical imaging, including image processing and interpretation, is one of the most promising areas of innovation in health innovation. There are many possible applications for artificial intelligence, ranging from image acquisition to data mining and storage to aided reporting. As a result of this wide range of applications, AI is expected to have a significant impact on radiologists' daily routines. A device that mimics cognitive functions, including learning and problem-solving, is called Artificial Intelligence. In diagnostic imaging, artificial intelligence is one of the most promising clinical applications. It is being fine-tuned to allow for the detection and quantification of many clinical conditions. Studies utilizing computer-aided diagnostics have demonstrated excellent accuracy, sensitivity, and specificity for detecting minor radiographic abnormalities, potentially improving public health.

Conclusion:

Artificial intelligence helps improve health care quality or effectiveness, increase healthcare productivity, prevent medical errors, and increase health care accuracy and procedural correctness. It helps to reduce health care costs. Extend real-time communications of health informatics among health care professionals and expand access to affordable care.

P19 - VESSEL WALL IMAGING IN CEREBROVASCULAR DISEASES

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Introduction:

High-resolution MR imaging is an emerging tool for evaluating intracranial artery disease. It has an advantage of defining vessel wall characteristics of intracranial vascular diseases.

Aim: To characterize intra cranial vessels wall by means of Non-contrast vessel Wall imaging Sequence

Indications:

Acute Stroke
Dissections
Aneurysms
Moya-Moya Disease
Atherosclerotic Plaques

- To differentiate among causes of intracranial arterial narrowing such as intracranial atherosclerotic plaque, vasculitis, reversible cerebral vasoconstriction syndrome, and arterial Dissection.
- To identify symptomatic, Non-stenotic disease of the intracranial Arteries. To determine the location of atherosclerotic plaque relative to branch artery ostia.
- To assess atherosclerotic plaque activity.
- To assess vasculitis activity.
- To determine which aneurysm has ruptured in patients with acute subarachnoid hemorrhage and multiple aneurysms.
- To predict future behavior of unruptured intracranial saccular aneurysms.

Blood Vessel MR-Imaging:

Time of Flight Angiography (TOF), Phase Contrast Angiography (PCA), Contrast Enhanced Angiography (CE-MRA) and **Vessel Wall Imaging (VW-MRI)**

Materials and Methods:

Equipment: MRI Scanner 1.5 Tesla

Imaging protocol:

Vessel Wall Imaging Sequence requires high spatial resolution, multi-planar 2D/3D Acquisition, multiple tissue weighting and Suppression of signal in human blood and CSF.

Sequences:

- Survey
- Brain Stroke Protocol(DWI/T2W/T1W/GRE/TOF)
- 2D/3D PDW SPAIR

Intracranial Vessel wall Imaging Characteristics:

Vessel Wall disease	Stenosis – MR/CT Angiography	Vessel Wall Thickening	Location	Enhancement	Special considerations
Intracranial Atherosclerosis	Equally present and not present	Eccentric	More Widespread distal ICA/Vertebral, focal lesions	Equally present and not present	Plaque characterizatio, Intraplaque hemorrhage
CNS Vasculitis	Often present	Concentric	More Widespread, Long trajectory	Virtually always present	Effect of steroid therapy Guiding best location for biopsy
Moyamoya Disease	Equally present and not present	Concentric	Distal ICA, Proximal MCA	Equally present and not present	--
Arterial Dissection	Virtually always present	Eccentric	Distal ICA/Vertebral	Often present	Detection of hematoma and flap, added value of fat suppression in case of an extra cranial dissection

Intracranial Aneurysm	Equally present and not present	--	--	--	Often enhances hen symptomatic, difficult to asses when SAH is present
RCVS	Often present	Concentric	More widespread	Often not present	
Latrogenic (after thrmbotectomy)	Equally present and not present	Eccentric /Concentric	Thrmbotectomy site	Often present	String of beads on angiograms

Conclusion:

Vessel Wall MR Imaging has gained much attention and become part of state-of-art MR imaging protocols to assist in diagnosing the cause of cerebrovascular diseases. Thus VW-MRI provides Radiologist and Interventional radiologist to plan further management.

References:

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3. **Intracranial arterial wall imaging using high-resolution 3-tesla contrast - enhanced MRI** R.H. Swartz, MD, PhD S.S. Bhuta, MD R.I. Farb, MD R. Agid, MD R.A. Willinsky, MD K.G. terBrugge, MD J. Butany, MD
4. **The Use and Pitfalls of Intracranial Vessel Wall Imaging**:- How We Do It Arjen Lindenholz, MD Anja G. van der Kolk, MD, PhD Jaco J. M. Zwanenburg, PhD Jeroen Hendrikse, MD, PhD

P20 - GADOLINIUM NEUROTOXICITY -CASE STUDY

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Background

In this paper presentation we are discussing about Association between exposure to gadolinium-based contrast agents and neurotoxicity in patients who have undergone contrast MRI in a tertiary care hospital.

Magnetic resonance imaging (MRI) is the wildest emerging noninvasive diagnostic modalities in medicine. It hires ground-breaking techniques and the latest discoveries, which are harmless actual, but even so it is tough to evade drawbacks particularly concerning lasting significances. The protection of gadolinium is now the most regularly deliberated.

Objectives

1. To see if there's a link between gadolinium contrast and neurotoxicity
2. Identification of newly developed neurotoxicity symptoms following the use of an MRI contrast agent
3. Identifying changes in frequency and magnitude of pre-existing neurotoxicity symptoms that are linked to pre- and post-contrast medical history.
4. To see if a single or many doses of intravenous gadolinium contrast are linked to new neurotoxicity symptoms and maybe additional side effects

Materials and Methods

The present study is a Retrospective study conducted among 45 patients selected by convenience sampling who undergo MRI brain contrast examination in the Department of Radiology for a period of one year.

Results

Majority of the study population were in the age group of 41-60 years (38%) Mean age is 48.76 and standard deviation is 7.86. There is no association between age and neurotoxicity. About 58% were males and 42% were females. About 78% of study participants were alive. Headache is the most common symptom (22%) followed by vision loss (18%). About 9% had memory loss and 7% had paralysis. About 4% had numbness and 4% had altered sensation. Among 10 patients with headache,2 developed it in the same day,6 within a week, and 2 within a month. Among numbness 1 developed in the same day and 1 in a week. Among vision loss 2 within a week and 6 developed within a month. Symptoms of neurotoxicity were present in 29% of study participants.

Conclusion

There are some associations between exposure to gadolinium-based contrast agents and neurotoxicity. These neurotoxicity symptoms frequency and magnitude varying from number of time patients undergone MRI contrast study. Which may lead to gadolinium retention, gadolinium deposition disease and nephrogenic systemic fibrosis.

P21 - CONSIDERATION OF PATIENT SAFETY IN CONTRAST MEDIUM

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OBJECTIVES:

Contrast agents play an important role in increasing the efficiency of diagnostic imaging techniques in the evaluation of vascular lesions, infections and tumours .

Side effects of contrast agents can belief -threatening, so observing that safety guidelines prescribed a key role in the patient's health.

MODALITIES USED BY CONTRAST MEDIUM:

- X-ray
- Fluoroscopy
- Ultrasonography
- Computed tomography
- Magnetic resonance imaging
- Interventional procedures

Contrast materials enter the body in one of three ways. They can be:

- Swallowed (taken by mouth or orally)
- Administered by enema (given rectally)
- Injected into a blood vessel (vein or artery; also referred to as being given intravenously or intra-arterially)

Safety measures used in contrast medium:

- Biographies of the patient before contrast agent injection
- Control the h/o disease prior to prepare the patient
- Control patient preparation prior to injection
- Complete consent form prior to contrast injection
- Complete questionnaire to identify patients at high risk (PAR)
- Attention to patient at risk
- Preventive measures for patient at high risk

- Educating patients about the possible side effects of administration of the contrast agent
- Hygiene of contrast agent injection site
- Control suction and oxygen therapy equipment function properly prior to contrast injection .
- Preparation and injection of contrast agents under the suitable temperature
- Observe speed of injection
- Use of sterile injection technique
- Care of the needle stick
- Use of safe disposal box after injection
- Monitor the patient for 60 minutes after injection
- Pre and post care is provided during contrast administration
- Skilled use of defibrillator
- Control access to cardiopulmonary resuscitation . Tralee before administration of contrast agent

CONCLUSION :

According to the safety precautions observed in the use of contrast agents is acceptable and design, implementation, control and monitoring is organised.

Procedures and policies related to quality, patient education, control of infection, and safety should be developed and each imaging department or facility should have written policies, protocols, and procedures regarding administration of intravascular contrast media.

REFERENCE:

1. Contrast Agents and Observing Patient Safety Programs in Radiology Departments in Kermanshah Province Hospitals in West of Iran
2. **Fatemhe Amiri,1 Mohammad Rasoul Tohidnia,1 Somayeh Haydarizadi,2 and Rasool Azmoonfar**
3. Patient Safety - Contrast Material - RadiologyInfo.org **https://www.radiologyinfo.org › info › safety-contrast**

P22 - MRI SLEEP STUDY

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Abstract.

MRI dynamic study reveals anatomy of the neck and Physiology of airway during sleep with acquired multiple phases in a plane during awake and sleep mode.

Technique

MRI dynamic acquisition of multiple phases in various planes.

Analysis

Measure wake and sleep mode antero-posterior and transverse collapsibility index.

Conclusion: To rule out causes of snoring and airway obstruction.

P23 - SIGNIFICANCE OF MR PERFUSION AND MR SPECTROSCOPY IN CHARACTERISATION OF BREAST MASSES ON MR MAMMOGRAPHY WITH HPE CORRELATION

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INTRODUCTION

Breast cancer is the second leading cancer-related cause of death in women. Breast MRI detects and distinguishes it from benign breast with high-resolution scanning using breast lesion morphology and enhancement characteristics. MR mammography was found to be an effective tool in differentiating benign from malignant suspicious breast lesions

INDICATIONS

- Screening for high risk patients
- To evaluate dense breast
- Breast implants
- Papillary discharge
- Evaluation of recurrent tumours

CLASSIFICATON OF BREAST LESIONS

Cancerous cells that develop within the body harm the healthy cells and tissues leading to death. Breast cancer, an unregulated cell growth in breast is 90% curable, once it is detected in its early stage. These uncontrolled groups of cells can be either benign or malignant lesion

POSITIONING

- Patient Position: Prone
- Patient Orientation: Feet First
- Landmark: Nipple

COIL USED - Breast array coil

SEQUENCES

Routine MR Mammogram sequences were performed in all patients which included T1W T2W, T2W FS, STIR, Diffusion weighted-Axials, Sagittal VIBRANT pre contrast, MR Perfusion (VIBRANT multiphase) in the Axial plane and single voxel MR Spectroscopy (BREASE).

PLANNING

- For Axial, Plan parallel in both sagittal and coronal planes in such a way covering from the entire breast
- For Sagittal, Plan perpendicular in both axial and coronal planes in such a way covering the entire breast

MR PERFUSION (DYNAMIC CONTRAST ENHANCED MRI)

- Breast lesion enhancement can be characterized qualitatively by assessing the enhancement kinetics curve obtained by plotting the signal intensity values in breast tissue intensity over time after contrast material injection.
- It has two phases in dynamic contrast enhancement

Initial phase Delayed phase -Persistent, Plateau and Washout

- Three enhancement patterns can be identified on the basis of the signal intensity-time curve **(kurl enhancement curve)**
  - Type 1 curve
  - Type 2 curve
  - Type 3 curve

MR SPECTROSCOPY(MRS)

- The two commonly used localization methods are single voxel spectroscopy (SVS) and chemical shift imaging (CSI). While CSI useful to evaluate the distribution of the viability of the breast cancer it is a time consuming, therefore SVS is more popular for the breast MRS.
- MRS can improve the specificity of MRI. The diagnostic value of MRS is generally based on the detection of elevated levels of Choline-containing compounds (Cho-3.2 ppm), which are the markers of an active malignant breast tumor.

CONCLUSION

- MR Mammogram being an advanced study tool and also a comparatively safer modality proves to be a boon for women in ruling out many of the breast pathologies.
- MR Spectroscopy has been complementary to MR Perfusion in providing adequate information to distinguish benign and malignant breast lesions.

P24 - EFFICACY OF PROTON DENSITY FAT FRACTION IN NON-ALCOHOLIC FATTY LIVER DISEASE

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INTRODUCTION

Non-alcoholic fatty liver (NAFLD) is a pathological syndrome that encompasses several clinical entities ranging from simple steatosis to steatohepatitis, fibrosis & end stage liver disease in absence of significant alcohol intake.

AIM

To assess the usefulness of MRI-proton-density fat fraction (PDFF) using two-point Dixon technique in non-alcoholic fatty liver disease

STAGING OF NON- ALOCHOLIC FATTY LIVER DISEASE

1. Simple fatty liver or steatosis
2. Non-alcoholic steatohepatitis (NASH)
3. Fibrosis
4. Cirrhosis

OBJECTIVE

To calculate proton density fat fraction (PDFF) of the liver in patients with non-alcoholic fatty liver disease and thereby evaluate the efficacy of two point DIXON in NAFLD.

PDFF MRI

MRI-PDFF is a quantitative imaging biomarker that enables accurate, repeatable and reproducible quantitative assessment of fat content over the entire liver.

BASIC PRINCIPLE OF PDFF

PDFF exploits the difference of the resonant frequencies between water and fat proton signals by using Dixon method. By acquiring the images at echo times at which water and fat signals are approximately in-phase (W+F) and opposed-phase (W-F)

CONCLUSION

MRI-PDFF is emerging as one of the leading non-invasive clinical quantitative tool that can be an alternate surrogate biomarker for liver biopsy in follow-up NAFLD patients.

PO 1 - ROLE OF IMAGING IN MANAGEMENT OF STROKE –POSTER PRESENTATION

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INTRODUCTION:

The goals of an imaging evaluation for acute stroke are to establish a diagnosis as early as possible and to obtain accurate information about the intracranial vasculature and brain perfusion for guidance in selecting the appropriate therapy. Before effective therapies were introduced for acute ischemic stroke, imaging was used primarily to exclude hemorrhage and other mimics of stroke, such as infection and neoplasm.

GOALS OF ACUTE STROKE IMAGING:

- Parenchyma- To rule out intracranial hemorrhage.
- Pipes -To identify the intravascular thrombus.
- Perfusion -To differentiate infarcted tissue from salvageable tissue (CBF, CBV & MTT).
- Penumbra -To assess tissue at risk of dying if ischemia continues without recanalization of intravascular thrombus.

ROLE OF CT SCAN IN STROKE:

- Non Contrast CT is widely available, can be performed quickly, can help identify early signs of stroke, and can help rule out hemorrhage (contraindication of thrombolytic therapy).
- Hyperdense ‘regular’ thromboembolic focus from a calcified cerebral embolus should be differentiated.

CT PERFUSION

- Allows both the core of the infract to be identified as well as the surrounding penumbra
- The area with decreased blood volume represents the unsalvageable ischemic core, and that with normal blood volume but decreased blood flow and increased mean transit time is the ischemic penumbra

ROLE OF MRI IN STROKE:

- Higher sensitivity and specificity in the diagnosis of acute ischemic infraction in the first few hours of onset.
- Diffusion-weighted MR imaging is more sensitive for detection of hyperacute ischemia.
- Gradient-echo MR sequences can be helpful for detecting a hemorrhage.

MR PERFUSION-DIFFUSION MISMATCH

- Perfusion-diffusion mismatch in magnetic resonance imaging (MRI) represents the non-core hypoperfused area in acute ischemic stroke.
- The mismatch has been used to predict clinical response after thrombolysis in acute ischemic stroke

ROLE OF USG IN STROKE:

- For the diagnosis of intracranial vessel occlusion, as well as the differentiation between ischemic and hemorrhagic stroke
- Sonographic monitoring for the detection of hemorrhage

CONCLUSION:

As CT and MR imaging technology advances result in faster and more accurate image acquisition, the emphasis in acute stroke evaluation is likely to shift from simple anatomic imaging to functional imaging to determine the viability of ischemic brain tissue and guide the appropriateness of therapy.

PO 2 - STRATEGIES TO MINIMIZE THE RADIATION DOSE DURING A CT EXAMINATION

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ABSTRACT:

Possible strategies to be used to reduce the dose to the patient obviously include the limitation of the examinations in those patients in whom it is strictly necessary and to avoid the execution of multiphase exams when there is no clinical need. Once evaluated the indication examination, in planning a CT scan of the abdomen, the strategies to be considered are not different from those adoptable examining other districts. The strategies to minimize the dose of radiation emitted during an examination of multidetector computed tomography are based on a fundamental concept: the attenuation of the contrast and the noise of the image are, respectively, directly and inversely proportional to the number of photons that reach to the series of detectors. Therefore the main variables involved in the protocols of the reduction of the effective dose is the current of the X-ray tube , which is expressed in milliamps (mA) and influences the flow of photons , the voltage of the X-ray tube (anode) , which is expressed the kiloVolts peak (kVp) and affect the energy of the photons , the exposure time that is determined for example by the pitch and the degree of attenuation of the photons that is influenced by body mass index of the patient; these variables at the same time contribute to the formation of images of good quality.

PO 3 - CHARACTERISTICS OF CORONARY ARTERY ATHEROSCLEROTIC PLAQUES IN CHRONIC KIDNEY DISEASE: EVALUATION WITH CORONARY CT ANGIOGRAPHY

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NITTE deemed to be university. Mangalore.

AIM

To determine the characteristics of coronary artery atherosclerotic plaques in chronic kidney disease (CKD) with coronary computed tomography angiography (CTA).

MATERIALS AND METHODS

Sixty-six patients with CKD who underwent coronary CTA were analyzed retrospectively. The extent, distribution, and types of plaques and stenosis severity were evaluated. The imaging features were compared between dialysis and non-dialysis groups. In the dialysis group, the imaging features were compared between diabetes and non-diabetes patients.

RESULTS

In total, 152 coronary vessels (2.3-1.3 per patient) and 306 segments (4.6-3.5 per patient) were found to have plaques. The most common diseased coronary vessel was the left anterior descending (LAD) artery (53 vessels, 34.9%) followed by the left circumflex (LCX) artery (39 vessels, 25.7%), and right coronary artery (RCA; 37 vessels, 24.3%) in sequence. The most commonly involved coronary artery segment was the middle segment of the LAD artery (14.1%). Calcified plaques (65.9%) were detected more frequently than mixed (25.6%) or non-calcified (8.5%) plaques ($p<0.001$).

CONCLUSION

A heavy plaque burden was detected in CKD patients at coronary CTA. Non-obstructive calcified plaque was the most common imaging feature. CKD patients with type 2 diabetes mellitus had more obstructive mixed plaques.

PO 4 - IMAGING OF INTRA-ORBITAL REGION FOREIGN BODIES USING COMPUTER TOMOGRAPHY IMAGING

UDAYAN.U B.Sc.RIT 2nd YEAR,

GUIDED BY: DR. VEENA NORONHA M.B.B.S., D.M.R.D., DNB.

PROF.MR. MARI MUTHU.C M.Sc. (Rad), M.B.A.(HM), D.R.D.T., CRA.

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INTRODUCTION:

Computed tomography (CT) is an imaging procedure that uses special x-ray equipment to create detailed pictures, or scans, of areas inside the body. It is sometimes called computerized tomography or computerized axial tomography (CAT).A CT scan of the orbit is an imaging method. It uses x-rays to create detailed pictures of the eye sockets (orbits), eyes and surrounding bones. An intra-orbital foreign body is an object that lies within the orbit but outside the ocular globe.

AIM:

The purpose of this study is to analyses the usefulness of the CT imaging techniques, protocol and diagnosing the type of foreign body present in the intra-orbital region.

MATERIALS AND METHODS:

GE CT machine of 128 slice.

- Duration of the study is 2 months.
- Total number of cases are 24.
- Spiral/multi slice 3D reconstructions of the intra-orbital region were performed using stored CT data.
- VRT 3D images with weighted MIP images were part of this study.

RESULT:

Study was conducted among 24 patients for the past 2 months in our department. Imaging plays an important role in localization of these objects and helped us to distinguish the structural and functional damage to the eye and the orbital contents caused by these objects depend upon the size, location and the time elapsed after the injury. These objects can be metallic, non-metallic or organic matter.

CONCLUSION:

In this study, we review the CT imaging techniques that aid in the diagnosis of foreign bodies present in the intra-orbital region. Hounsfield scale provides the HU values which helps in providing the density of the foreign body which is present in the orbital region.

PO 5 - POOR MAN'S PET

M.THANGA RAJA B.Sc. RIT 3rd YEAR KAPV MEDICAL COLLEGE, TRICHY

GUIDED BY PROF. DR SENTHIL VEL MURUGAN HOD DEPT OF RADIOLOGY,

MGM HOSPITAL TRICHY

INTRODUCTION:

In Poor Man's Pet Studying That Whole Body Mri Has Emerged As An Excellent Candidate For Staging And Survilance Of Patients Seeing The Comparison Of Fdg Pet And Whole Mri In Oncology And Knowing The Techniques Of Whole Body Mri.

PET-CT:

Use Of Fdg Tracer Made Up To Introduce Now, That Pet Contribution To Oncologic Imaging. Technique Uses Ionizing Radiation And Has Some Concerns Spatial And Contrast Resolution. False Positive And False Negative Results Of Fdg Pet Are Well Known.

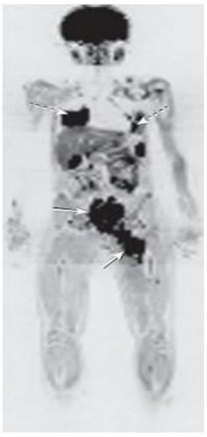
WHOLE BODY MRI TECHNIQUE:

In Whole Body Mri By Using Non Ionizing Radiation With High Soft Tissue And Good Spatial Resolution Is An Useful Application For Tumor Detection And Staging Of Malignancies By Using Mri Sequences And Could Overcome The Limit Of Fdg-Pet/Ct With Clinical Acceptable Time Under 40 Minutes.

INDICATION:

Breast Cancer, Prostate Cancer, Osteomyelitis, Multiple Myeloma, Lymphoma, Cancer Screening

PATIENT POSITIONG: SUPINE HEAD FIRST



SCANNING AREA: HEAD TO KNEE OR HEAD TO TOE.

COILS:

- Head And Neck Array Coil
- Body / Spine Array Coil-Chest Region
- Body / Spine Array Coil-Abdomen Region
- Peripheral Coil- Pelvis To Toe Or Knee

CENTERING - POSITIONED ON CHIN

SEQUENCES:

- LOCALIZER-HEAD AND NECK, THORAX, ABDOMEN, PELVIS.
- T2 TSE STIR COR- HEAD AND NECK, THORAX, ABDOMEN, PELVIS.
- DIFFUSION B50,800 AXIAL

POST PROCESSING TECHNIQUE: MIP, 3D, COMPOSING TECHNIQUE

CONCLUSION:

Based On Literal Findings Whole Body Mri Seems To Be A Valid Alternative Method Compared To Fdg / Pet. Dwi When Performed Seemed To Provide A Added Value To Whole Body Mri Compared To Fdg/Pet.

Wb-Mri Was Highly Sensitive In Detecting Distant Metastases (Sensitivity Was 96% For Wb-Mri And 82% For Fdg-Pet/Ct).

PO 6 - ARTIFACTS IN COMPUTED TOMOGRAPHY

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INTRODUCTION

Artifact is the distortion or error in the image that is unrelated to the object being scanned and CT images are inherently more prone to artifacts than conventional radiographs due to image is reconstructed from something in the order of million dependent detector measurements and artifacts can seriously degrade the quality of CT images and it is necessary to understand it's types and remedies to reduce such artifacts.

TYPES OF ARTIFACTS

There are types of artifacts based on physics such as beam hardening partial volume averaging artifacts Based on patient artifacts like motion, metal out of field artifacts Based on scanner artifacts like ring artifact, cone beam, stair step and pitch artifact.

CONCLUSION

Artifacts degrade the image quality providing blurred images which will be difficult for image interpretation for technologist and radiologist, so it is necessary to understand its causes, its appearance on ct images and how to rectify it thereby optimizing the image quality.

PO 7 - MULTI CHUNK THREE-DIMENSIONAL INFLOW MR ANGIOGRAPHY

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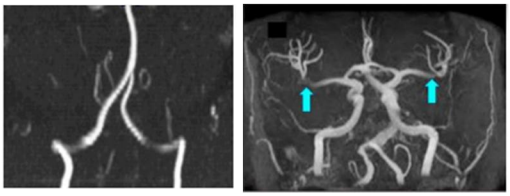
INTRODUCTION

Time of flight angiography (TOF) is an MRI technique to visualise flow within vessels, without the need to administer contrast. It is based on the phenomenon of flow-related enhancement of spins entering into an imaging slice. With 3-D TOF, a volume of images is obtained simultaneously by phase-encoding in the slice-select direction.

MOTSA

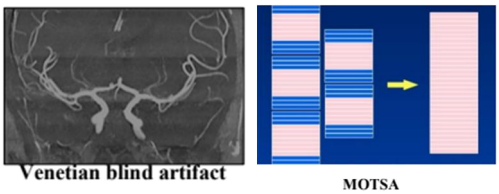
Multiple Overlapping Thin Slab Acquisition (MOTSA) is a hybrid between 2D and 3D TOF techniques. MOTSA involves the sequential acquisition of a several overlapping 3D volumes. MOTSA thus offers a method to cover a relatively large anatomic area using 3D TOF with preserved intravascular signal intensity.



Stair-step artifact In-plane artifact

TOF MRA ARTIFACTS

- Stair-step artifact (2D TOF only)
- In-plane artifact
- Shine-through artifact
- Flow-reversal artifact
- Susceptibility artifact
- Venetian blind artifact
- Stair-step artifact In-plane artifact



Venetian blind artifact MOTSA

MOTSA

REMEDIES

- By overlapping slices, the stair-step artifact can be minimised
- Use TONE to reduce venetian artifact

POST PROCESSING

The acquired images can be combined by using a technique of reconstruction such as maximum intensity projection (MIP).

ADVANTAGES

- Decreased sensitivity to flow saturation seen with the MOTSA as compared with single volume 3D TOF
- Good resolution

CLINICAL APPLICATIONS

- ✓ Carotid bifurcation
- ✓ Peripheral circulation
- ✓ Cortical venous mapping

ADVANCES IN MOTSA

- ➢ MOSA- Multi oblique stack acquisition
- ➢ CHARM- Chunk Acquisition and Reconstruction Method
- ➢ SLINKY- Sliding Interleaved Ky
- ➢ TONE- Tilt Optimized Non saturated Excitation

CONCLUSION

MOTSA mainly has venetian blind artifact. The remedies to reduce this artifact and to improve resolution the techniques were improved. In 3D TOF, allows thicker chunks to cover a larger anatomical region. The new advances in techniques make the diagnosis easier and faster without any interpretation.

PO 8 - STERILIZATION TECHNIQUES IN RADIOLOGY

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ABSTRACT

Sterilisation is the elimination of all disease-producing micro-organisms, including spores (e.g. Clostridium and Bacillus species) and prions. Sterilisation can be done on medical equipment/devices and, whenever possible, semi critical medical equipment/devices.

STERILIZATION:

- Total destruction of all microorganisms
- Decontaminates medicines and surgical instruments
- Gives extreme cleanliness Gives extreme cleanliness

DISINFECTION:

- Killing of bacteria in a material using disinfectants
- Decontaminates surfaces and air
- Gives adequate cleanliness.

ROLE OF HEALTHCARE WORKERS

Health-care workers should adhere strictly to the recommendations pertaining to cleaning, disinfection, and sterilization.

STERILIZATION PROCESS

- Arranging
- Loading
- Sterilization
- Unloading
- Issued to Radiology department

STERILIZATION TECKNIQUE

- Steam sterilization
- Gas (Ethylene Tri- Oxide) sterilization
- Flash sterilization
- Microwave sterilization
- Infrared sterilization
- Ionizing radiation sterilization

CONCLUSION

Efficiently implemented policies and guidelines of disinfection and sterilization can ensure ideal infection control measures in health care organization.

PO 9 - ULTRASOUND ELASTOGRAPHY

Reshma Gaonkar & Sakshi madkaikar

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Elastography-based imaging techniques have received substantial attention in recent years for non-invasive assessment of tissue mechanical properties. These techniques take advantage of changed soft tissue elasticity in various pathologies to yield qualitative and quantitative information that can be used for diagnostic purposes. Measurements are acquired in specialized imaging modes that can detect tissue stiffness in response to an applied mechanical force (compression or shear wave). Ultrasound-based methods are of particular interest due to its many inherent advantages, such as wide availability including at the bedside and relatively low cost. Several ultrasound elastography techniques using different excitation methods have been developed. In general, these can be classified into strain imaging methods that use internal or external compression stimuli, and shear wave imaging that use ultrasound-generated traveling shear wave stimuli. While ultrasound elastography has shown promising results for non-invasive assessment of liver fibrosis, new applications in breast, thyroid, prostate, kidney and lymph node imaging are emerging.

Here, we review the basic principles, foundation physics, and limitations of ultrasound elastography and summarize its current clinical use and ongoing developments in various clinical applications.

PO 10 - GOOD PRACTICE IN PAEDIATRIC TRAUMA-CT IMAGING

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Abstract:

Children are much more sensitive to the harmful effects of radiation than adults. Therefore not even a high- energy trauma of a child should automatically lead to a routinely performed CT-scan. One of the significant part of the treatment is the radiological examination of the trauma- patient. A CT-examination for a child is always decide individually based on clinical findings and FAST US (Focused Assessment with Sonography for Trauma). Because of the potentially high radiation dose of CT it is important to have as far optimized examination protocols as possible and even a trauma-CT should always be focused only on the area of interest. We have also optimized our practice in contrast medium injection for trauma body and trauma-abdomen examinations. For those protocols we use a dual-injection, which allows us to see both arterial and venous phases in one exposure. We continuously monitor the image quality and patient dose and have been part of the dose collection for national reference levels.

PO 11 - HRCT TECHNIQUE AND ITS APPLICATION

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INTRODUCTION:

High resolution computed tomography is the use of thin section CT images (0.625 to 2mm slice thickness) with a high spatial frequency reconstruction algorithm. To detect, characterize, and determine the extent of diseases involving lung particularly in interstitial lung disease for better survival outcomes and it accurately depicts bony erosion and associated soft tissue pathologies. **HRCT LUNG -** HRCT of the lung is used in the diagnosis and assessment of interstitial lung disease.

INDICATIONS:

- Interstitial lung disease
- Chronic infiltrative lung disease
- Hemoptysis
- Emphysema
- Bronchial disease

PROCEDURE FOR HRCT LUNG:

Scout is taken then in the plain study series of axial sections planning is done from apex of the lung to dome of the diaphragm to acquire the HRCT image.

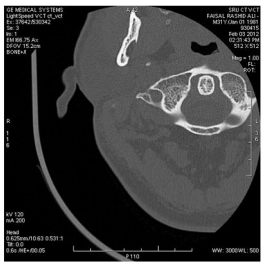
PARAMETERS:

The scan type was axial and the detector coverage was about 40mm.The acquisition slice thickness of about 1.25mm with a interscan delay of about 1.3sec and the interval was about 10.0mm

HRCT TEMPORAL BONE:

Temporal bone anatomy is complex, and three-dimensional orientation of associated structures. High resolution computed tomography is ideally suited for imaging the temporal bone because of its ability to demonstrate the bone and air space anatomy

INDICATIONS:



- Trauma
- Sensorineural hearing loss
- Tinnitus
- Chronic suppurative otitis media (CSOM)

PROCEDURE FOR HRCT TEMPORAL BONE:

Scout is taken and in the plain study axial planning is done. Then the separate recon planning for left and right temporal bone is done from top of the pinna to hard palate. Finally post processing techniques like tick view, tooth view, cone view and cochlear view is done.

PARAMETERS:

The scan type was helical and the detector coverage was about 20mm. The acquisition slice thickness of about 0.625mm with an interval of 0.625mm and the pitch was about 0.531:1

CONCLUSION:

CT should be used to assess focal lung disease that has been shown to be indeterminate, HRCT aids assessment of indeterminate lung disease and in the evaluation of prerequisite temporal cochlear implants.

PO 12 - CR ARTIFACTS

PRASHANTH. A

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DEPARTMENT OF RADIOLOGY

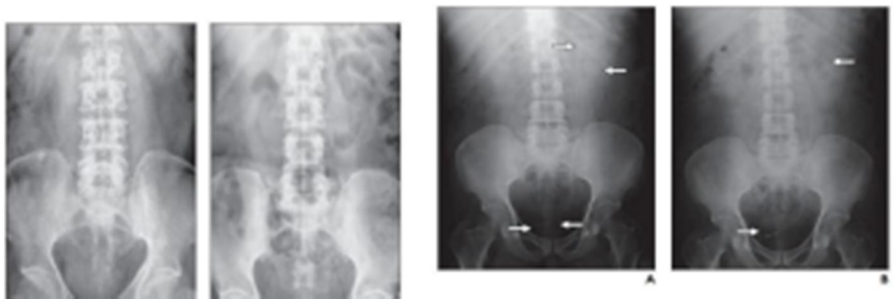
SAVEETHA COLLEGE OF ALLIED HEALTH SCIENCES, CHENNAI

INTRODUCTION:

- An artifact on an image is a feature that does not correlate with the physical properties of the subject being imaged and may confound or obscure interpretation of that image.
- An artifact is a structure or an appearance that is not normally present on the radiograph and is produced by artificial means. Radiographic errors may be due to technical errors [Errors related to the technique of. Taking the radiograph] or processing errors [related to all aspects of processing]

TYPES OF CR ARTIFACTS:

- Image Acquisition Artifacts.
- Image Processing Artifacts.



2. Twin artifact 1. Inappropriate exposure factors

CONCLUSION:

It is extremely important, to the extent that it is possible, that the radiologist is able to have confidence that image information relates to the patient anatomy rather than being false information pertaining to an image artifact. A visual familiarity with radiographic artifacts can help in identifying when image information cannot be trusted. In addition, understanding the mechanisms for the formation of various artifacts can help in being able to resolve or prevent their appearance, to improve the consistency and quality of radiographic imaging.

PO 13 - IRRADIATED DOSE CALCULATION DURING UNKNOWN PREGNANCY

NEJWA.V.A & SHARMEEN.K

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Even With Precautionary Steps, It Is Likely That The A Radiographer Will Encounter May Occasions When A Patient Who Was Absolutely Certain That She Would Not Be Pregnant. Later Discovered That She Was So,At Time Of Her X-Ray Examination. The Revelation Usually Is Communicated To the Imaging Department By The Patient's Obstetrician And Is Accompanied By A Request For The Amount Of Radiation Dose That Patient's Embryo – Fetus Received From X-Ray Study.

PO 14 - MAGNETIC RESONANCE CHOLANGIO PANCREATOGRAPHY (MRCP)

Karuppasamy Pandian V & Jayasurya K BSc RIT 2nd YEAR

SRM Medical College *Hospital* and Research Center. Trichy.

Abstract

Magnetic resonance cholangiopancreatography (MRCP) is a special kind of MRI test. Your healthcare provider uses it to look at the biliary and pancreatic system. This includes the pancreas, the pancreatic duct, the bile duct, gallbladder, and liver. It is a special type of MRI that gives detailed pictures of your pancreas, gallbladder and bile ducts. You usually have and MRI scan of your tummy (abdomen) at the same time as the MRCP. MRCP isn't available in all hospitals. You may have to travel to a specialist center to have an MRCP.

PO 15 - RADIOLOGY TECHNOLOGIST LEVEL OF KNOWLEDGE ABOUT RADIATION EXPOSURE DIAGNOSTIC IMAGING PROCEDURES

Joginder Singh, Prashant.

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Abstract:

Radiological imaging of patients to physicians in the diagnosis but rather provide valuable information, especially since they provide emergency life-saving importance of early diagnosis in patients may have are. However, the radiation used during the imaging process are carcinogenic and teratogenic effects. The negative effects of radiation, especially pregnant women and children as well as shots of patients who are also important for radiology technicians. In this study, commonly used in radiological examinations of patients exposed to ionizing radiation dose of about physicians and radiology technicians aimed to investigate the level of knowledge.

PO 16 - RADIATION SAFETY PRECAUTION AND DOSE MANAGMENT IN MULTIMODALITIES

JITHIN LAL E. T, B.Sc. MIT 3rd Year

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INTRODUCTION:

Radiation safety is the concern of all health care providers who perform procedures associated with radiation imaging, whether for diagnostic purposes or therapeutic procedures. Radiation Protection is a tool for the management of measures to protect health against the risks of unnecessary exposure generated using ionizing radiation

RADIATION BASED MODALITIES: X-ray, CT, Fluoroscopy, mammography, and nuclear medicine

GOAL OF RADIATION PROTECTION:

The goal of radiation protection is to prevent the occurrence of serious radiation induced conditions in exposed persons and to reduce stochastic effects in exposed persons to a degree that is acceptable in relation to the benefits to the individual and to society from the activities that generate such exposure

ALARA:

Concept implies good radiation protection program and practices which has been effective in keeping average and individual dose for monitored workers well below the limit.

PRINCIPLES OF RADIATION PROTECTION:

Time: Reduce time of your exposure

Distance: Increase Distance from the source

Shielding: Make use of available shielding e.g.: lead apron, thyroid shield

JUSTIFICATION:

No practice involving radiation exposures shall be adopted unless it produces a net positive benefit.

OPTIMIZATION:

Every effort shall be taken to reduce the dose as low as reasonably achievable, considering the clinical, social, and economic factors

DOSE LIMITS:

The effective doses to the individuals shall not exceed the limits recommended by the commission

METHOD TO REDUCE DOSE TO PATIENT AND PERSONNEL IN MULTIPLE MODALITIES:

X-ray:

Reduction of exposure factor and unnecessary radiographs, use of protective barrier

Fluoroscopy:

Fluoroscopy only when viewing, use pulsed fluoroscopy when possible, Use last image hold, Unnecessary Screening & Exposure time can be avoided

CT:

Basic Radiation protective measures should be followed as per ALARA guidelines Parameters Increasing the radiation dose such as Tube Current(mA), Tube voltage (kV), Pitch, Slice thickness, Scan length, Multiphase examination can be optimized to desirable & optimal range.

NUCLEAR MEDICINE

The control of occupational exposure in nuclear medicine is effectively utilised by numerous actions as: design of facilities, designation of workplaces in control and supervised areas, individual monitoring arrangement, area monitoring, monitoring for contamination, use of personal protective devices and protective tools as appropriate, following the local rules and procedures for safe handling of radiopharmaceuticals and appropriate education and training.

CONCLUSION:

Having a clear knowledge on radiation safety and its protection measures on various modalities will ensure the reduction of health risk for both workers and the patients.

PO 17 - MR SAFETY – AN OVERVIEW OF B1+RMS OVER SAR

HAMEED SULTHAN.J

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INTRODUCTION:

In overview of B1+RMS**,** it specifies the maximum patient RF exposure in terms of the RF magnetic field used to create the image in addition to SAR. It is a parameter that has been displayed on the console monitor. It has many advantages over SAR related to MR safety.

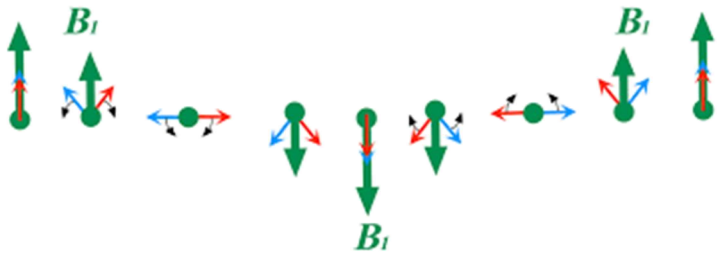
DEFINITION:

B1+RMS is the time-averaged RF magnetic field component relevant for creating an MR image that is generated by the scanner during a scan and is measured in units of micro-Tesla (μT).

SAR (Specific Absorption Rate) is a measure of the rate at which energy is absorbed by the body when exposed to a radio frequency (RF) electromagnetic field. It is measured in units of Watts per kilogram of body weight.

PROCESS OF B1+RMS:

When a patient enters an MRI magnet, protons in the body align in the direction of the B0 magnetic field similar to a compass aligning with the earth's magnetic field. An MR imaging sequence is composed of a series of RF pulses that produce a magnetic field that interacts with these magnetically aligned protons and rotates them through a specific angle typically called the 'flip angle' or 'tip angle.' The RF magnetic field produced by the scanner is called the 'B1' field of which only one part known as the positively rotating or '+' component is useful for 'flipping' the magnetically aligned protons and allows images to be created. The maximum 10-second time averaged B1+ field strength8 of the RF pulses in the imaging sequence is the root-mean-square or 'RMS' B1+ value of the imaging sequence



ASSOCIATION OF B1+RMS WITH SAR:

SAR is patient dependent, it varies depending on a patient's size and mass and there is no absolute direct measure of SAR that can be performed during an MRI scan. The MRI system can measure the B1+ field (the positively rotating RF magnetic field produced by the MRI scanner) needed for an imaging sequence, and uses the time averaged B1+ field, or B1+RMS, to predict the estimated SAR that will occur due to that imaging sequence.

MODIFICATION FOR B1+RMS REDUCTION:

- Increase the RF pulse duration
- Utilize a "Low SAR" mode of other similar option
- Increase the repetition time (TR) without reducing the number of slices
- Reduce the number of slices for a given TR
- Reduce the Echo Train Length (ETL)
- Reduce the refocusing angle (FSE sequences)
- Reduce the flip angle (e.g., for gradient echo pulse sequences)
- Use a GRE sequence instead of a spin echo or fast spin echo pulse sequence

ADVANTAGES OF B1+RMS OVER SAR:

B1+RMS is a more precise RF exposure metric than SAR due to following reasons,

- B1+RMS is the time averaged fundamental RF field parameter related to MR image creation. The scanner calibrates the RF pulse B1+ field strength during pre-scan and the B1+RMS value for an imaging sequence is determined by the scan parameters needed to produce the desired tissue contrast.
- Depends only on flip angle, and independent of b0 field strength.
- SAR is a conservative estimate of the RF power deposited in a specific region of the patient under examination (head, whole-body, and partial-body) for a particular B1+RMS value.
- Can be directly calculated by measuring transmitter voltages producing the incident RF irradiation.

SIGNIFICANCE:

The use of b1+rms measurement is for the conditional labeling of implants. Modifying parameters based on B1+RMS instead of SAR is a significant advance for patients and clinicians because B1+RMS is a more accurate and reproducible measure of potential implant heating in the MRI scanner. Utilising B1+RMS for implant labeling allows for the greatest possible performance of MRI scanning protocols while also ensuring patient safety.

CONCLUSION:

A good understanding of parameters by the technologist paves a way in ensuring RF safety to patients.

PO 18 - CT KUB SCANS FOR RENAL COLIC: OPTIMISATION OF SCAN RANGE TO REDUCE PATIENT RADIATION BURDEN

GIRISH BISANAL 3RD SEM MSc MIT

K S Hegde Medical Academy

(NITTE Deemed To Be University) Mangalore.

INTRODUCTION:

Non-contrast CT KUB scans performed to assess renal colic should be limited to scanning between the upper pole of the highest kidney and the pubic symphysis to minimise unnecessary irradiation. The aim is to assess the amount of over scanning in CT KUBs outside this range.

MATERIAL AND METHODS:

CT KUB scans taken over a 10 day period were assessed. Unnecessary overscan above the highest kidney was measured as a percentage of the total scan range. A target of less than 10% overscanning was set. The vertebral position of the upper pole of the highest kidney was also measured and compared to the actual level of the scan.

RESUTS:

88 patients were assessed. 89.8% (79/88) of scans didn't meet the target of less than 10% overscanning above the highest kidney, and were associated with a higher radiation dose to the patient. The average overscanning above the highest pole of the kidney was 16.4% of the whole scan. The average overscan below the pubic symphysis was 1.54%. We also found that 100% of scanned kidneys lied below the upper border of the T11 vertebra, in spite of scans starting as high as T7.

CONCLUSION:

A large proportion of scans included unnecessary overscanning above the highest kidney. And identified that upper border of the T11 vertebral body as a potential location from which to begin the upper margin of a CT KUB scan.

By starting CT KUB scans at the upper border of the T11 vertebral body, it can allow the whole kidney to be imaged while minimising unnecessary overscanning above the kidney, thus lowering excess patient irradiation while still producing high quality scans.

PO 19 - FOREIGN BODY RADIOGRAHY

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Saveetha College of Allied Health Sciences, Thandalam,Chennai.

Introduction :

The radiological appearance in plain radiography of foreign bodies is the x-ray attenuation of the foreign body, the surrounding structures and any overlying structures that may veil the object.

Types :

- Percutaneous.
- Ingestion.
- Inhalation.
- Insertion.
- Transocular Advantage & Disadvantage :
- Metal, glass, and stone can be visualized very well using conventional plain film radiography
- whereas more organic structures, such as wood,

Not visualized by x ray or ct Treatment for removal :

- Suction machine- remove object from nose or ear
- Bronchoscopy-remove object from airway Endoscope- remove object from stomach or rectum
- Surgery-sometimes necessary if removal of object

Not possible Conclusion :

Foreign body radiography is useful for detection of foreign bodies with dept & position clearly.

PO 20 - THORACIC PATHOLOGICAL CONDITION WITH ITS UNIQUE SIGN AND APPERANCE IN VARIOUS MODALITIES – CONDITION, MANIFESTATION & ITS DIAGNOSIS

Christy V J, Abhishek P.R. B.Sc. Mit 2nd Year

Department Of Radiology & Imaging Science

BGS Global Institute Of Medical Sciences, Bgs Gims, Bangalore

AIM:

To categorize various unique signs of thoracic pathologies in multiple modalities and understanding its unique symptoms, condition and its diagnosis.

INTRODUCTION:

Radiological signs are classical and distinctive, which characterize various abnormalities, diseases or a group of similar pathologies which can be seen on different modalities. These signs don't necessarily indicate a particular disease, but are usually suggestive of a group of similar pathologies which will facilitate in the narrowing down of the differential diagnosis.

PATHOLOGIES OF CHEST:

Chest x ray can detect cancer, infection or air collecting in the space around a lung which can cause the lung to collapse. They can also show chronic lung condition as well as complication.eg: - Adult cystic fibrosis, Asthma, Bronchiectasis, Chest wall cancer, Emphysema, Pneumonia.

SIGNS APPEARANCE SYMPTOMS DIAGNOSIS

WESTERMARKS SIGN

- Swelling body parts
- Shortness in breath
- Oligemia
- Hypovolemia
- Distal to pulmonary embolism

ANGEL WING OR BAT WING SIGN

- Chest pain
- Cough

- Fatigue
- Fever
- Vomiting
- Pneumonia
- Pulmonary hemorrhage
- Sarcoidosis

BOOT SHAPED HEART SIGN

- Blueish color in skin
- Shortness of breath
- Poor weight gain
- Tetralogy of Fallot

SNOW MAN HEART SIGN

- Blue or purple tint to lips, nail
- Heart murmur
- Total anomalous pulmonary venous return

CONCLUSION:

Several radiological features have been associated with common images, sign, symbols, and naturalistic figures-which may be encountered in everyday life. Linking specific imaging patterns to these symbols or sign is easy to understand and radiological recognition of various disease.

PO 21 - STUDY TO ASSESS THE ROLE OF DATES SYRUP, PINEAPPLE JUICE AND HEMATINIC SYRUP AS MR ORAL CONTRAST AGENTS IN IMPROVING IMAGE QUALITY OF MRCP

BALACHANDER.V

B.sc Medical imaging technology

INTRODUCTION

The purpose of this poster is to assess the role of date syrup, pineapple juice and hematinic syrup as MR oral contrast agent in improving image quality of MRCP Magnetic resonance cholangiopancreatography (MRCP) is a special type of magnetic resonance imaging (MRI) exam that produces detailed images of the hepatobiliary and pancreatic systems, including the liver, gallbladder, bile ducts, pancreas and pancreatic duct.

MATERIAL REQUIRED

- Philips Multiva 1.5 Tesla
- Date syrup
- pineapple juice
- hematinic syrup

IMAGE ACQUISITION

Comparison of the in vitro effect of using different syrups/juice with that of other contrast agents in T2 Weighted and MRCP sequences, qualitative and analysis of syrup and juices. Find the nature and concentration of iron in it, and in vivo evaluation of syrup/juices for improving the quality of MRCP images. Formula used to calculate the study ia standard deviation

CONCLUSION

Date syrup has high of paramagnetic ion concentration so it effects a excellent T-2 shortening effect. Due to it has a S/N Ratio of high value to produce an improved image quality of MRCP.

PO 22 - GADOLINIUM RETENTION

AJAY KONKI, 2ndYEAR BMIT

Background

Over the past five years, several studies have reported deposition and retention of gadolinium in the brain after administration of gadolinium-based contrast agents (GBCAs) during radiological procedures. Patients with renal insufficiency cannot filter gadolinium efficiently; however, gadolinium is also retained in the brain of some adults and pediatrics with no renal impairment. In the literature, data is mostly available from retrospective magnetic resonance imaging (MRI) studies, where gadolinium deposition may be indirectly measured by evaluating changes in T1 signal intensity in the brain tissues, particularly in the deep gray matter such as the dentate nucleus and/or globus pallidus.

Methods

In this poster the Pharmacovigilance Risk Assessment Committee (PRAC) of the European Medicines Agency (EMA) earlier this year recommended to suspend some marketing authorisations for Gadolinium Containing Contrast Agents (GCCAs) based on linear chelators due to the potential risk of gadolinium retention in the human body. These recommendations have recently been re-evaluated by EMA's Committee for Medicinal Products for Human Use (CHMP), and confirmed the final opinion of the European Medicines Agency. This editorial provides an overview of the available GCCAs and summarises the recent evidence of gadolinium retention. Moreover, a critical appraisal of the strengths and limitations of the scientific evidence currently available on gadolinium retention is given.

KEY POINTS

- EMA recommended suspension of some EU marketing authorisations of four linear GCCAs.
- Brain MRI findings indicating gadolinium retention have been confirmed by mass spectrometry.
- Current scientific evidence for gadolinium retention has several methodological limitations.
- No clear clinical evidence exists indicating that gadolinium retention causes neurotoxicity.

CONCLUSION

In this work we have detailed datasets, literature and commercial products relevant to deep learning in Gadolinium retention For researchers entering the field this study categorizes the existing data and literature for their ease of reference. In this section we further discuss how future research should be directed for higher quality and better clinical relevance.

REFERENCES

Mr. Arul S Assistant professor

Department of Medical Imaging, AIAHS

PO 23 - PHOTON-COUNTING DETECTOR CT

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(NITTE- Deemed to be University)

INTRODUCTION:

Photon-counting detector (PCD) CT is an emerging technology that has shown tremendous progress in the last decade. It uses new energy resolving X-ray detectors, with mechanisms that differ substantially from those of conventional energy-integrated detectors.

PRINCIPLE:

During direct conversion, electron-hole pairs are produced within the semiconductor due to the absorption of X-rays. Between the cathode at the top and the pixelated anode electrodes at the bottom of the detector, the charges are separated by a strong electric field. The electrons migrate to the anodes, They cause small pulses lasting for few nanoseconds. The current pulses are converted into voltage pulses using a full width at half maximum of 10 -15ns in a pulse-shaping circuit. The pulse height of the voltage pulses is translated from the quantity of charge in the current pulses. As a result, the pulse height is proportional to the absorbed X-ray photon's energy. When these pulses reach a certain threshold, they are individually measured. Typically, the minimum threshold energies are >20 keV. The threshold is set so that the pulses are greater than the electronic noise but lesser than the pulses produced by the coming photons. The detector may also categorize incoming photons into several energy bins based on their energy by comparing each pulse to numerous threshold values. As a result, the pulse counts are nearly free of electronic noise. The total energy deposited throughout the measurement interval, electronic noise is measured and integrated using EIDs.

CONCLUSION:

PCD-CT may lead to modifying CT's clinical utility in the upcoming years drastically with its high spatial resolution, reduced noise and artifacts, increased CNR, and providing multi-energy data acquisition while maintaining diagnostic quality images at lower radiation dose.

PO 24 - OCULAR ULTRASOUND

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Introduction :

The ocular ultrasound is an imaging technique that uses high frequency sound waves to create an image of the retina and the surrounding structures.

Indications:

- Retinal and Vitreous Detachment
- Vitreous Hemorrhage
- Foreign Body
- Ectopia lentis (Lens Dislocation)
- Retrobulbar Hematoma

Equipments :

Ocular ultrasound should be performed with the high-frequency linear probe(opthalmic transducer) and many ultrasound machines have an ocular setting.

Advantage :

The benefits of ultrasound include Improved visualization of structures obscured by opaque substances such as dense cataracts or vitreous hemorrhage. . Ocular ultrasonography may result in earlier detection of ocular melanoma.

PO 25 - ROLE OF DIFFUSION WEIGHTED IMAGING IN VARIOUS PATHOLOGIES

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INTRODUCTION

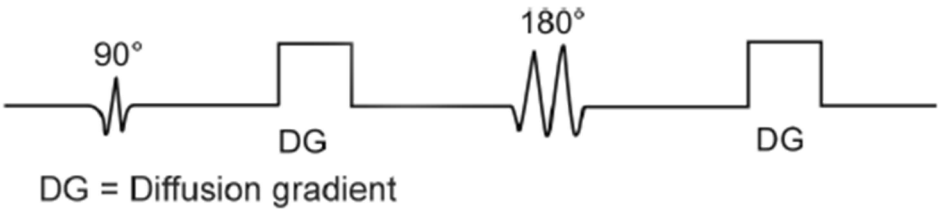
Diffusion is the random Brownian motion of the molecules driven by thermal energy. Diffusion can measure the water protons displacement at the cellular level.

The average net displacement of the molecules is called apparent diffusion coefficient (ADC) restrictions in diffusions are directional depending upon structure of the tissue.

Diffusion of molecules also occurs across tissue, especially from the areas of restricted diffusion to area with free diffusion.

BASIC PRINCIPLES OF DIFFUSION-WEIGHTED IMAGING

It is a T2 weighted spin echo sequences with diffusion gradients applied before and after the 180 degree pulse. Most commonly applied to echo planar imaging



B value indicates the strength and sensitivity of motion probing gradient. Normal b value used for brain imaging is 1000 sec/mm2; abdomen is 800 sec/mm2.ADC values are usually inversely proportional to diffusion values (degree of restrictions).

Area of restricted diffusions is seen as hyper intense on diffusion weighted images and hypo intense on ADC images and vice versa .as b value increases the signal from water molecules reduces.

CLINICAL APPLICATIONS OF DWI

ROLE OF DWI IN BRAIN PATHOLOGIES

Diffusion is used to differentiate acute and chronic infarct, since cells are full of large molecules and membranes, diffusion is restricted and the ADC of the tissue is reduced. These areas appear bright on diffusion images and these changes can be seen within minutes of infarction. Epidermoid cyst is composed of keratin, debris which is a hindrance to diffusion of the water molecules. Hence, the epidermoid is seen as a bright lesion on DWI. Since arachnoid

cyst is a clear CSF containing cyst, it will not be bright on DWI and will be same as CSF in the signal intensity.

ROLE OF DIFFUSION IN THORACIC PATHOLOGIES

DWI is used to distinguish malignant from benign and inflammatory lung lesions. Malignant pulmonary lesions have lower ADC values than benign lesions

ROLE OF DIFFUSION IN BREAST IMAGING

In breast imaging b value of 800 sec/mm2 is used. Malignant breast lesions have lower ADC values than

benign diseases.

ROLE OF DIFFUSION IN MUSCULOSKELETAL IMAGING

DWI improves the accuracy and differentiation of acute osteoporotic from malignant fractures.

ROLE OF DIFFUSION IN SPINE IMAGING

It is very useful in the characterization of cord lesions. Active myelinating lesions tend to be hyper intense in dwi. it also helps in detection and characterization of infectious diseases like osteomyelitis, discitis and abscess.

DWI can also be used to differentiate malignant from benign lesions, and tumor from edema and infarction. This is because these disease processes have different ADC values. In addition, DWI is proving a useful tool to image neonatal brains where it is sometimes difficult to discriminate between infarction and myelinating brain.

CONCLUSION

DWI has opened a new paradigm with information about molecular activity and cellular function. Recent advances in this field have touched new horizons with the arrival of functional diffusion MRI.

PO 26 - NEUROLOGICAL EMERGENCY CT

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INTRODUCTION

Neuroimaging has become a key diagnostic tool in the emergency department. Complaints of weakness, dizziness, headache, and trauma lend themselves to rapid evaluation and diagnosis through the use of computed tomography (CT).

- Trauma is the leading cause of death in patients younger than 45 years.
- Another major indication for neuroimaging in the emergency department is stroke.

PURPOSE

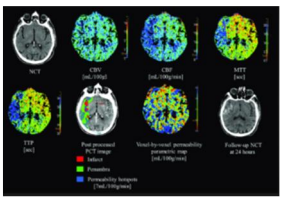
CT scans can provide more detailed information about brain tissue and brain structures than standard X-rays of the head, thus providing more data related to injuries and/or diseases of the brain. During a brain CT, the X-ray beam moves in a circle around the body, allowing many different views of the brain.

STROKE PROTOCOL CT

Stroke protocol CT usually includes

1. CT (brain)

2. CT perfusion (brain)



CLINICAL PRESENTATION

HISTORY	PHYSICAL
Head trauma	Altered mental status; unresponsiveness; deficits in Glasgow Coma Scale
Motor vehicle collision	Depressed skull fracture
Assault	Penetrating head injury

Loss of consciousness	Focal neurologic deficit such as weakness, paresthesia, gait abnormality, aphasia, cranial nerve abnormality
Seizure	Intoxication
Loss of executive function or cognition	Amnesia
Headache	abnormal behaviour

DIAGNOSTIC WORKUP

CT is the imaging procedure of choice in evaluation of acutely injured patients or patients with acute neurologic deficit. CT is Quick, easy, reliable, and routinely available, CT is valuable in making a firm diagnosis as well as in excluding alternative diagnoses or the sequelae of other pathology, even in uncooperative patients.

CONCLUSION

Evaluation of the brain with computed tomography (CT) has become an indispensable tool in the emergency setting, providing accurate diagnosis of patients in a timely manner.

PO 27 - CT PULMONARY ANGIOGRAM IN CONGENITAL HEART DISEASE

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ABSTRACT

CT pulmonary angiogram (CTPA) is a study of pulmonary arteries and pulmonary veins by injecting contrast medium. A pathological condition causes both partial and complete intraluminal filling defects, which should have a sharp interface with intravascular contrast material. CT pulmonary angiogram accurately depicts many forms of congenital cardiovascular disease in pediatrics.

VARIOUS CONGENITAL HEART DISEASES INCLUDES

- Tetralogy of Fallot and Other Right Ventricular Outflow Tract Obstructive Lesions
- Transposition of the Great Arteries
- Truncus Arteriosus
- Total Anomalous Pulmonary Venous Return
- Single Ventricle Disease and Heterotaxy Syndrome

CONTRAST AGENT

Non-ionic contrast media **(Iohexol - Omnipaque 350mgI/ml)** is given intravenously using pressure injector depending on the patient weight.

PATIENT POSISTIONING

Patient positioned in supine with feet first orientation. centering is kept at sternal notch with Proper immobilization of the patient.

PROCEDURE

First Scout image is taken. Plain phase is acquired followed by contrast phase. The scan direction is caudo- cranial. The contrast is being injected and the angiogram phases are obtained for the study. A region of interest is planned over the right atrium, once the contrast reaches the ROI, contrast phase is started. Finally the images are reformatted and reported.

INTERPRETATION

It can be used to systematically evaluate the aorta, pulmonary artery, pulmonary vein, cardiac chambers and ventriculoarterial connection, relation between the upper lobe bronchi and pulmonary arteries, coronary arteries, valves and systemic veins.

CONCLUSION

Pulmonary CT has developed into a key tool among CHD. It can provide information for both preoperative planning and postoperative surveillance and facilitates scanning even in critically ill patients or those with implanted devices.

PO 28 - ROLE OF PET-CT AND ITS DIAGNOSTIC APPLICATIONS

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ROLE OF PET-CT IN DIAGNOSTIC MODALITY:

Nuclear medicine uses small amounts of **radioactive** material called radiotracers such as F-18 fluorodeoxyglucose (FDG), a molecule similar to glucose, linked to, a small amount of radioactive material. They accumulate in tumors or regions of inflammation. Cancer cells are more metabolically active and may absorb glucose at a higher rate. This higher rate can be seen on PET scans. This allows your doctor to detect disease before it may be seen on other imaging tests.

PET images are collected by multiple rings of specialized detector crystals . Each decay event yields a positron, which is a positively charged electron. The PET scanner detects these photons simultaneously (or "in coincidence"), so the event is recorded and localized as a positron annihilation, or "event." By collecting millions of these events, modern PET devices use sophisticated hardware and software to reconstruct images of the distribution of the PET tracer.

CT scanning is often the best method for detecting or to confirm the presence of a tumor and determine its size and location. CT is fast, painless, noninvasive and accurate. CT imaging provides excellent anatomic information.

PET-CT scan is a way to help find cancer and learn its stage. Stage is a way to describe where the cancer is and if it has spread, then how the cancer is affecting your body's functions. Combined PET/CT scanners perform facilitate interpretation of the images, pinpoint abnormal metabolic activity and anatomical details so that provide more accurate diagnoses than the two scans performed separately.

DIAGNOSTIC APPLICATION OF PET-CT

PET-CT Scans To Provide More Information About The Cancer Such As

- Detect Cancer And/Or Make A Diagnosis.
- Determine Whether A Cancer Has Spread In The Body.
- Assess The Effectiveness Of Treatment.
- Determine If A Cancer Has Returned After Treatment.
- Evaluate Prognosis.
- Assess Tissue Metabolism And Viability.
- Determine The Effects Of A Heart Attack **Myocardial Infarction** On Areas Of The Heart.

- Identify Areas Of The Heart Muscle That Would Benefit From **Angioplasty** Or **Coronary Artery Bypass Surgery** .
- Evaluate Brain Abnormalities, Such As Tumors, Memory Disorders, Seizures And Other Central Nervous System Disorder.

Advantages :

- PET/CT include better localization of activity, better identification of inflammatory lesions, CT visualization of PET-negative lesions (especially bone lesions), discovery of serendipitous abnormalities, confirmation of unusual or abnormal sites, and improved localization for biopsy or radiotherapy.
- greater detail with a higher level of accuracy;
- greater convenience for the patient who undergoes CT and PET at one time rather than two different times.

LIMITATION:

- Nuclear medicine procedures can be time consuming. It can take several hours to days for the radiotracer to accumulate in the area of interest., imaging may take up to several hours to perform.
- The image resolution of nuclear medicine images may not be as high as that of CT or MRI.
- Altered blood sugar or blood insulin levels may adversely affect the test results of diabetic patients or patients who have eaten a few hours prior to the exam.
- A very obese person may not fit into the opening of a conventional PET/CT unit.

CONCLUSION:

The combination of separate CT and PET has become improved the standard of imaging care for many oncology patients, therefore more precisely confirming nonmalignant structures. In addition, it offers improved localization of malignant lesions, includes detection of staging (especially for extranodal disease), better follow-up of sentinel lesions, improved targeting of biopsy and therapy, and greater confidence in interpretation. It also improves the detection of non–FDG-avid tumors that would not be evident on a PET study alone.

PO 29 - MANAGEMENT OF TRAUMA PATIENT IN RADIOLOGY

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INTRODUCTION

TRAUMA is defined as a severe injury or damage to the body caused by an accident or violence. Imaging in trauma, can be an challenging environment for a properly prepared imaging professional plays a crucial role in the assessment and planning of appropriate care

TRAUMA TEAM

- ER Physician
- Staff Nurse
- Emergency trauma care technologist
- **Radiology Technologist**

IMAGING MODALITIES

- Plain radiograph- Cervical and Lumbar spine, Abdomen erect, Chest AP, upper and lower limb
- USG FAST (**F**ocused Assessment with **S**onography for **T**rauma)- Safe in pregnant and pediatrics patient, to visualize Peritoneum, Pleura, Laceration.
- CT scan- To rule out Intracranial bleed, Pneumothorax, Multiple fractures
- MRI scan- To rule out Acute infarct, Spinal fractures, Ovarian torsion

TECHNOLOGIST ROLE

- Trained in first aid, Basic life support (BLS),
- Check C-A-B (Circulation, Airway, Breathing)
- Perform quality diagnostic imaging procedures as requested and competent patient care

PATIENT PREPARATION

The patient sustentation is important as they have an emotionally disturbing and distressing event in addition to the physical injuries. Check the patient thoroughly for items that might cause an artifact on the image.

POSITIONING OF THE PATIENT

The primary challenge of the trauma technologist is to obtain a high-quality, diagnostic image on the first attempt when the patient is unable to move into the desired position.

BREATHING INSTRUCTIONS

Most injured patients have difficulty following the recommended breathing instructions for routine projections. For these patients, exposure factors should be set using the shortest possible exposure time to minimize motion on the image. If the patient is unconscious or unresponsive, careful attention should be paid to the rate and degree of chest wall movement.

IMMOBILIZATION DEVICES

The key issues in the use of immobilization in trauma are to avoid exacerbating the patient's injury and avoid increasing his or her discomfort.

BEST PRACTICES IN TRAUMA

- **SPEED & ACCURACY-** Should give quality images in shortest time to ensure prompt and accurate diagnosis
- **QUALITY**-Quality does not have to be sacrificed to produce an image quickly.
- **ATTENTION TO DETAIL**-The radiographer should never leave a trauma patient (or any patient) unattended during imaging procedures
- **MONITORING PHYSIOLOGICAL PARAMETERS**-The technologist must ensure the monitoring of patient's vital such as Blood pressure, ECG Respiratory care, O_2 **Saturation**. Be smart enough to recognize the need impending cardiac/respiratory
- **TRANSPORTATION-** If the patient is unable to move, he may be drawn along with either sheet or blanket on which patient lies.
- **DOCUMENTATION-**Any alterations in routine projections have to be documented on the film.

TIPS DURING EMERGENCIES

- Presence of mind
- Should be as quick as possible and should be well familiar with equipment
- Must handle patient with care
- Monitor vitals
- Assist the medical team in case of emergencies in order to revive the patient

PATIENT SAFETY AND QUALITY

- Provide services to humanity with full respect for the dignity of mankind.
- Acts in the best interest of the patient.
- Practices ethical conduct appropriate to the profession and protect the patient
- Uses equipment and accessories, employs techniques and procedures, performs services in accordance with an acceptance.

CONCLUSION

Having thorough knowledge about the significance of traumatic injuries and the skills to handle the emergency situations will result in a satisfactory job of a technologist and help prompt patient management.

PO 30 - ROLE OF MR PERFUSION IN DETECTING BENIGN AND MALIGNANT BREAST LESION

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INTRODUCTION:

Magnetic resonance imaging (MRI) is more sensitive for breast cancer than standard x-raymammography or ultrasound,when using dynamic contrast-enhancement (DCE) methods afteradministration of intravenous (IV) gadolinium-based contrast agents.

MR BREAST PERFUSION:

Perfusion can give additional information in vascularization of breast lesions, useful in the characterization of breast lesions and monitoring chemotherapeutic effect.The underlying principle of all variations of DCE-MRI studies is rather simple: as a paramagnetic particle enters and disperses through the tissue, it alters the MR signal intensity (SI) of the tissue depending on its local concentration

TYPES OF PERFUSION IN MR MAMMOGRAM:

- DYNAMIC SUSCEPTIBILITY CONTRAST-ENHANCEDPERFUSION*:* It relies on the susceptibility induced signal loss on T2*weighted sequences which results from a bolus of gadolinium-based contrast passing through a capillary bed. The most commonly calculated parameters are**rCBV,rCBFand MTT**.
- DYNAMIC CONTRAST-ENHANCED PERFUSION: It calculates perfusion parameters by evaluating T1 shortening induced by a gadolinium-based contrast bolus passing through tissue. The most commonly calculated parameter is **k-trans**.

SEQUENCE:VIBRANT(dynamic contrast)-Different phases to visualize the enhancement of lesion.

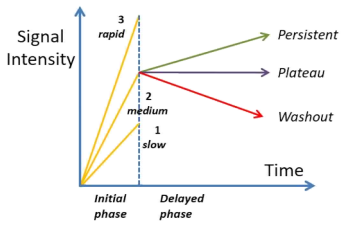
KINETIC ENHANCEMENT CURVE OR KUHL'S CURVE:

Type I curve (progressive or persistent) - Benign

Type II curve (plateau) - Suspecting for malignancy

Type III curve (washout) - Strongly suggestive

of malignancy



CLASSIFICATON OF BREAST MASSES

- Benign breast massesare localized abnormal growths, but they do not invade the surroundingstructures or spread beyond the breast. They are not life-threatening and can be removed withsurgery and do not usually come back.
- Malignant breast masses if not detected and treated early, continue to grow, invade and destroythe adjacent normal breast tissue. They have a tendency to spread to surrounding lymph nodes.

BENIGN BREAST MASSES	MALIGNANT BREAST MASSES
1. Cysts&Lesion 2. Mammary duct ectasia 3. fibroadenoma	Non-invasive 1.Ductal carcinoma insitu Invasive 1.Ductal carcinoma 2.Lobular carcinoma

CONCLUSION:

Mr mammography was found to be an effective tool in differentiating benign from malignant suspicious brest lesions The type of margin and the enhancement patterns both individually and in combination provide the clinicians with ample information so as to decide on further management.

S1- PROMINENCE OF DIAGNOSTIC IMAGING TO GET RIGHT WITH SENSORY NEURAL HEARING LOSS -A RETROSPECTIVE STUDY ANALYSIS

Aravind Raja. K Bsc.RIT 3rd Year

Aarthi Scans Pvt Ltd . Chennai

INTRODUCTION

Sensory-neural hearing loss (SNHL) is a type of hearing loss of deafness. In which the root cause lies in the inner ear cochlea and it's associated structures and vestibule cochlear nerve

AIM

To evaluate CT and MR cochlear measurements for pediatric patients prior to implementation

OBJECTIVE

To assess cochlear pathologies prior to implementation To derive the canal dimensions of cochlear from CT which helps in selecting the cochlear implement of suitable length To determine whether CT Imaging measures of the cochlear. Dimensions accurately predicts the of a "straight" cochlear implement array

MATERIALS & METHODOLOGY

Study Design -- Retrospective Study place -- Aarthi scans and labs Pvt Ltd chennai Time period -- March 2022 – July2022 Study population -- 25 inner ears Inclusion criteria -- SNHL and hearing loss

POSITIONING

	CT	MRI
ORIENTATION	Head first	Head first
LANDMARK	Glabella	Glabella
COIL TYPE		Head matrix volume coil

PROCEDURE

Patient is screened and positioned for CT and MR Imaging and post-processing are carried out following the examination and canal dimensions are obtained.

CONCLUSION

CT and MR Imaging complements each other in the diagnosis and workup of the patients with SNHL.

S2 - BIOMETRIC EVALUATION OF DENTAL CONE-BEAM COMPUTED TOMOGRAPHY PRIOR TO THE PLANNING OF DENTAL IMPLANTATION

Ayyappan.s BSC.RIT(3rd YEAR)

AARTHI SCANS PVT LTD Chennai

INTRODUCTION :

Traumatic Dental Injuries Often Occur As A Result Of Rta introduce of cbctchandes the practice of the oral And Maxilla Facial Radiology

AIM:

To evaluate cone beam ct measurement of maxilla and mandible for the patients Prior To Implantation

OBJECTIVE :

- To perform cone beam ct and assess maxilla and mandible Pathologies Prior To Implantation
- To devise the dimensions Of The Maxilla And Mandible from cone beam ct which helps in selecting the Dentine Implants Of Suitable Length
- Cbct is useful for many maxilla facial applications Such As Implant Site Imaging Diagnosis and Treatment Planning For orthodonties and cranio facial surgery

MATERIAL AND METHODOLOGY :

STUDY DESIGN : RETROSPECTIVE STUDY

PLACE : Aarthi Scans Pvt LTD Chennai Department OF Radiology And Imaging Sciences

STUDY POPULATION : 100

INCLUSION CRITERIA : Patient Who Post Operative And Implant Follow Patients With Complaints Of Rta{ Road Traffic Accident }

EQUIPMENT : CASTREAM (CS9300 with ceph)

PROCEDURE

Symptomatic patients For the study Were Screened With Consent Form documentation In The Department Of Radiology and imaging technology after explaining in dental about the study Patient was Positioned And Cone beam computed tomography Was Performed And The Dimensions of the mandible and maxilla Were Desired For Further Dentine Implant Length Calculation

CONCLUSION

Cone Beam Computed tomography imaging plays and important role in the diagnosis of various pathologies of Maxilla And Mandible And Is the perfect tool which aids in planning dentine implant .

S3 - RADIOGRAPHIC ASSESSMENT OF LONG BONE ORTHOSCANOGRAM

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INTRODUCTION:

It is a special type of radiography to measure the long bone .In orthopedic field the scanogram are used to measure real size/ length of the bone.

WHAT IS SCANOGRAM ?

It is a radiographic technique used to determine the accurate and reproducible assessment of limb length and whole spine is required for successful treatment.

INDICATION:

- Scoliosis.
- Kyphosis.
- Limb Shortness patient.
- Osteoporosis.

MATERIAL AND METHODS:

Equipment:

Computed x ray unit-Siemens Heliophus D 600 mA.

Accessories:

- Long length vertical cassette holder CR
- Long length cassette (single exposure entire lower limb).
- Ball markers.

PROCEDURES:

- To level both ASIS using block according to limb length discrepancy
- Pattella facing forward
- Scan area- illiac crest to the distal surface of the OS calcis.
- 4 cassettes with single exposure.
- Distance- 6 feet.
- Beam center at pattela.
- Exposure- depending upon patient thickness.

ADVANTAGES:

- Greater accuracy.
- Less susceptibility to error if the patient is poorly positioned.
- Specifically Indicated when the patient has a knee flexion contractures or is in a circular external fixator.

X Ray v/s CT:

X RAY	CT
Single exposure.	Spiral exposure.
Fine image quality.	Image quality is slightly lesser than x ray.
Standing position.	Supine position.
Limb allignment can be adjusted.	Limb allignment cannot be known.

CONCLUSION:

This approach allow for a more comprehensive radiographic evaluation of lower extremities including deformity analysis ,which reducing the expense , radiation and image quality and accurate measurement helps the surgeons for surgical purpose .

S4 - THE CONTRAINDICATIONS AND CRITERIA OF RADIOLOGY

"Is it still a concern in this modern age?"

R. Adityan and V. Rajadurai

Final year M.Sc., RIT, KMCH Institute of Allied Health Sciences, Coimbatore.

2 Tutor, KMCH Institute of Allied Health Sciences, Coimbatore.

The main focus of this presentation will be focussed on the conventionally followed contraindications and criteria for diagnostic radiological examinations and its prevalence in this modern age. The diagnostic radiography and imaging technology has various modalities with its own crucial nature. It also has its potential disadvantages in the name of "Contraindications" too which states that under certain conditions the diagnostic radiographic technique is impossible to perform. For the diagnostic imaging during pregnancy, USG can be done with reduced exposure time, CT and MRI can be done by justifying the benefit risk ratio and scan time. Patients with previous allergic reaction history to contrast media can be examined by changing the contrast media or with the help of premedication. The updated ESUR guidelines recommend the use of iodinated contrast media in pregnant patients only under limited and exceptional conditions. The ACR concludes that gadolinium based MRI examination for pregnant patients should be considered only when diagnostic outcome is justified. For lactating women, breast feeding is not a mandatory to stop unless the patient is in high risk category. In recent days all the timely followed procedures were potentially replaced by various clinical studies, recommendations, guidelines, and advancements in technologies leading to the betterment of human wellbeing at any cause. The future of medical imaging relies on eliminating all these contraindications without the cost of patient health and image quality.

S5 - SONOGRAPHIC IMAGING IN MALE INFERTILITY

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INTRODUCTION:

It is a retrospective study based on the sonographic imaging in infertilile men evaluated based on the sonographic appearances. In approximately 20% of infertile couples, male infertility is the major cause of the inability to conceive nearly contributing 50% of the overall cases. The cause of impaired sperm production and function can be related to congenital or acquired factors that act directly at the testicular level.

AIM & OBJECTIVE:

The imaging of scrotal, penile doppler & trans-rectal sonography is to identify the causes of infertility, such as congenital anomalies and disorders.

MEDICAL HISTORY & PHYSICAL EXAMINATION:

Behavioural changes and also including duration of infertility, patient age & his partner's age (any gynaecological cofactors), intake of medications affecting the hypothalamic pituitary gonadal access, frequency of sexual intercourse, H/O smoking & alcohol intake, pubertal development & disorders, H/O previous genital surgery.

CAUSES OF MALE INFERTILITY:

The major causes of male infertility includes pretesticular, testicular & post testicular factors

PROTOCOLS INCLUDED:

Protocols included in this study are; scrotum ultrasonography, penile doppler & trans-rectal ultrasound

SCROTUM ULTRASONOGRAPHY:

It is a non-invasive imaging technique to assess the testes and extra-testicular structures such as epididymis, pampiniform plexus, spermatic cord, groin. This examination can be used to evaluate testicular abnormalities, prostatic abnormalities and erectile dysfunction.

PENILE DOPPLER:

It is a non-invasive technique that enables characterization of arterial and venous blood flow within the erect penis. Functional changes in penile blood flow, as seen in erectile dysfunction, can be analysed using colour doppler ultrasonography.

TRANSRECTAL ULTRASONOGRAPHY OF PROSTATE:

It is done to evaluate the prostate and to identify the major cause of spermatic obstruction. An Introduction to azoospermia.

TECHNIQUE:

Scrotal ultrasonography is performed using a high-frequency linear array transducer (around 9- 12MHz). Transverse and longitudinal ultrasound of the testes, colour flow doppler ultrasound for testicular and spermatic cord vascularity are performed.

Testicular volume is calculated as (length x width x AP diameter), the normal value ranges between 15-20 ml. Penile doppler is performed using a high frequency linear array transducer (9-12MHz) where papaverine hydrocoele 60mg (2ml) is injected in the left corpora cavernosa artery region.

Injection is given to achieve the erectile status of the penis and to dilate the cavernosa artery. Pre & post injection measurements of the cavernosa artery are taken.

The peak systolic and diastolic velocity measurements are also noted. Transrectal ultrasound is performed using a high frequency linear transducer inserted through rectal route for evaluating abnormalities in the rectum, including prostate.

Measurements such as; seminal vesicle diameter, ejaculatory duct diameter are noted & any cyst or calcification in these ducts are also noted.

CONCLUSION:

The diagnostic workup of male infertility should be systematic and structured; however, it should not be started before the infertile couple has attempted to achieve pregnancy for 1 year. Ultrasonography imaging and appearances of various male genital protocols has an important role in differentiating the causes of infertility, from causes of obstructive azoospermia.

S6 - COMPARISON OF COMPUTED TOMOGRAPHY HOUNSFIELD UNIT WITH SHEAR WAVE ELASTROGRAPHY IN CHARACTERISATION OF FATTY LIVER

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DEPARTMENT OF RADIOLOGY & IMAGING SCIENCES

MEENAKSHI ACADEMY OF HIGHER EDUCATION & RESEARCH, KANCHIPURAM

Introduction:

Nonalcoholic fatty liver disease (NAFLD) is one of the most common causes of chronic liver diseases. NAFLD consists of a spectrum of diseases, including simple steatosis, nonalcoholic steatohepatitis (NASH), liver fibrosis, and liver cirrhosis. Ultrasound-based Elastography is primarily used as an alternative to minimally invasive liver biopsy for the assessment of hepatic fibrosis. CT can represent fatty liver quantitatively by measuring liver attenuation (Hounsfield unit).

Aim of the study:

To evaluate and compare the values of velocities measured by shear wave Elastography and Liver attenuation (HU) by Computed Tomography.

Objective:

To perform 2D shear wave Elastography and CT Abdomen to obtain fibro scan values in clinically indicated patients

Materials and Methodology:

Study design **:** Prospective study of 25 patients.

Study period **:** 2 months

Study place **:** Meenakshi Medical college Hospital & Research Institute, Kanchipuram

Inclusion criteria: Patients with chronic liver disease and elevated LFT

Exclusion criteria: Obstructive Hepatobiliary pathology, severe cardiac problems, massive ascites and hepatic encephalopathy.

We prospectively enrolled twenty five consecutive patients suspected to have liver disease who has come for consultation in medical gastroenterology of Meenakshi Medical College Hospital and Research Institute were referred for CT Abdomen was included along with Ultrasound Elastography was performed.

Summary of the result:

In our study we determined correlation between computed tomography hounsfield unit and the values of velocities measured by SWE. By statistical analysis p value was significant when mild Fatty liver disease was compared with moderate and severe Fatty liver disease

Conclusion:

This study compares Ultrasound grades of fatty liver disease with CT Hounsfield unit in characterization of Fatty liver disease. CT Hounsfield unit decreased with severity of Fatty liver disease. Hence we conclude Ultrasound Shear wave Elastography is a reliable and sensitive modality for the grading of Fatty liver disease.

S7 - FUSION IMAGING

KALYAN BABU THUMATI, 2nd YEAR BMIT

Background

The necessity of image fusion is growing recently in image processing applications due to the tremendous amount of acquisition systems. The fusion of images is defined as an alignment of noteworthy Information from diverse sensors using various mathematical models to generate a single compound image. CT, MRI, and PET (and obviously PET/CT) can clearly show the presence of extensive tumour within the mediastinum, but lesser degrees of invasion cannot be reliably diagnosed or excluded by either modality is considered as a vital pre-processing phase for several applications such as robot vision, aerial, satellite imaging, medical imaging, and a robot or vehicle guidance. In this paper, various state-of-art image fusion methods of diverse levels with their pros and cons have been discussed. Finally, this review has concluded various future directions for different applications of image fusion.

Methods

PET/CT, PET/MRI

Key Points

- ➢ Increased diagnostic accuracy.
- ➢ Precise monitoring of interventional procedures.
- ➢ Reduced radiation exposure, e.g., dynamic US after obtaining a CT map
- ➢ Both CT and PET using fluorodeoxyglucose (FDG) play an important role in the diagnosis and staging of patients with lung cancer.
- ➢ PET using FDG provides excellent metabolic information on the tumoral lesions in a whole-body study.

CONCLUSION

In this work, we have detailed datasets, literature, and commercial products relevant to deep learning in Fusion imaging for researchers entering the field this study categorizes the existing data and literature for their ease of reference. Further discussion on how future research should be directed for higher quality and better clinical relevance can be noted.

REFERENCES

Mr. Swapnil Shetty

Assistant professor

Department of Medical Imaging, AIAHS

S8 - A RETROSPECTIVE EVALUATION OF THE DIFFERENTIAL DIAGNOSIS OF THE SMALL BOWEL IN COMPUTED TOMOGRAPHY

Ramapratheepa M.

Bsc.RIT (3rd YEAR)

AARTHI SCANS PVT LTD Chennai

INTRODUCTION

CT Enterography is a non invasive imaging technique that offers superior small bowel visualization compared with standard abdominal CT and provides complementary diagnostic information.

AIM

To evaluate the significance of CT Enterography in assessing differential diagnosis of the small bowel

OBJECTIVE

To perform CT Enterography in symptomatic patients.

To analyze differential diagnosis of the small bowel

METHODOLOGY AND MATERIALS:-

1. STUDY DESIGN: Retrospective
2. STUDY PLACE : Aarthi Scans Pvt Ltd Chennai
3. STUDY PERIOD: 2022February- 2022 April
4. INCLUSION CRITERIA: Symptomatic patients
5. EXCLUSION CRITERIA: Non-cooperative patients
6. EQUIPMENT:-GE 16 slice (ACTS ES Refurbished CT scanner)
7. PATIENTS POSITION: Supine
8. ORIENTATION: Feetfirst
9. LANDMARK: Xiphisternum

PROCEDURE:

Patient is screened with consent form documentation following the proper procedure explanation CT

Enterography is performed and differential diagnosis are obtained for evaluation.

CONCLUSION:

CT Enterography is the asset in diagnosing various small bowel pathologies.

S9 - CT VIRTUAL COLONOSCOPY

MSc MIT , KSHEMA , Mangalore

Introduction:

CT colonoscopy or virtual colonoscopy is a radiographic imaging technique that produces 3D images of the colon. It is performed for colorectal anomalies.

Aim:

Evaluate Benefits of Ct colonoscopy.

Methodology:

The patient is prepared for the study. The patient lies on the examination table. Air is used to delineate the bowel. It is administered via a rectal tube. The scanning proceeds with the production of 2D images. These images are further reconstructed to 3D images by use of Navigator or fly-through, post-processing technique. This provides a virtual endoluminal view of hollow structures correlating to 3D endoscopy. Under this, the entire colon is divided into exactly two halves. Then a virtual camera is assigned to each half to perform fly-over navigation. It provides control on the elevation of the camera to maximize the surface areas visualized. The camera viewing volume is perpendicular to each colon half. The navigation is repeated at a different split orientation.

Summary:

It is a non-invasive procedure that produces 3D images of the colon using computed tomography. No anesthesia is required. It is indicated for colorectal cancer, obstructive colonic neoplasms, and in case of failed colonoscopy. It is contraindicated in acute IBD and diverticulitis. The presence of colonic tumor complications, such as obstruction, perforation, and fistula, are readily visualized by it. The presence of any significant extracolonic pathology is also highlighted which may alter the management profoundly.

Conclusion:

Computed tomography (CT) colonoscopy has high sensitivity rates for evaluating colorectal cancer. Since its discovery, significant advances have been made in the technique. It can efficiently detect both colorectal cancer and polyps with the application of appropriate techniques.

S10 - CT TRIPLE PHASE –LIVER

Mr.Sanjay Kumar, Govt.Chengalpattu Medical College

INTRODUCTION:

Ct Triple Phase Is A Non-Invasive Technique Used To Evaluate The Focal Liver Lession,Hemangioma,Hepatocellular Carcinoma, Liver Cirrhosis, Tumor By Using Administration Of Iv Contrast Media

PATIENT PREPARATION:

- Npo 4-6 Hrs
- Check For Rft & Lft
- Informed Consent

EQUIPMENT:

- Siemens Healthineers 32 Slice Ct Scanner
- Pressure Injector

CONTRAST MEDIA :

- NON IONIC CONTRAST MEDIA [Eg: IOHEXOL]
- DOSE : 1.5ml/Kg OR 2ml/kg
- FLOW RATE : 3-5ml/sec

PROCEDURE:

- Patient Positioned On Ct Couch And Landmark Is Assigned
- Helical Scanning Is Done From Diaphram To Symphysis Pubis
- Three Distinct Phase Of Contrast Enhancement Is Done
- Which Is Easily Used To Evaluate Pathological Condition In Liver

THREE DISTINCT PHASE :

1. Hepato Arterial Phase: Starts At 35 Sec After Contrast Injection Used To See Hypervascular Tumour
2. Portal Venous Phase : Starts At 75 Sec After Contrast Injection Used To See Hypovascular Tumour
3. Equilibrium Phase : Starts At 3-4 Mins But Better Done In 10 Min After Contrast Injection Used To See Retension Of Contrast In Blood Pole Like Hemangioma

CONCLUSION :

Triple Phase Ct Is Good And Non Invasive Tool Used To Differentiate Benign And Malignant Tumor Particularly Used For Hypervascular Lession Which Is Easily Missed On Routine Ct Scan Advantages Disadvantages Non Invasive Technique High Radiation Dose Short Scan Compared To Mri False Positive Result

S11 - TRIPHASIC CT SCAN-Liver: Scan protocol modification to obtain optimal vascular contrast

Abhijith S, MSc MIT 3rd Semester

Kayalvizhi R, Asst. Professor, Dept. of MIT

K.S. Hegde Medical Academy, Nitte Deemed to be University

Introduction:

With advances in helical computerized tomography (CT) with greater anatomic coverage, more rapid scanning times have revolutionized hepatic imaging. The entire liver can be evaluated in a single breath-hold without respiratory mis-registration. But optimizing the scan window has become critical.

Aim:

The aim of this study was to optimize scan delays using bolus tracking techniques for triple phase CT of the liver.

Materials and methodology:

20 patients were selected randomly, who were referred for triple phase study to our department. They were divided into two groups A & B of 10 patients each. They were administered 1.5mL/kg of 300mg/mL Ultravist at a rate of 3.0 mL/s with a pressure injector. Using bolus tracking technique, scans were performed at 5, 19 & 44 s and 8, 22 & 47 s for the first, second and third phases, for group A & B respectively. The CT numbers (Hounsfield Units) were measured in the aorta, hepatic artery, portal vein and liver parenchyma.

Results:

In hepatic arterial phase, hepatic artery has shown better enhancement in group B (8s). In portal venous phase, there were no significant differences in any of the vessel enhancement. In the hepatic venous phase, liver parenchyma shown better enhancement in group B patients (47 s).

Conclusion:

A delay of 8 s, in post trigger threshold early arterial phase is found optimal enhancement and liver parenchyma showed maximum enhancement at 47 s delay.

S12 - INFERIOR VENACAVA FILTER PLACEMENT AND REMOVAL

MAGESH K

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INTRODUCTION

Inferior vena cava filter placement is a interventional procedure, performed by interventional radiologists under fluoroscopic guidance, to place a filter in the inferior vena cava (IVC), the large vein in the abdomen that returns blood from the lower body to the heart.

Inferior vena cava filter is an endovascular device which is typically placed in the infrarenal inferior vena cava (IVC) to prevent pulmonary embolism in selected patients.

INDICATIONS

- Contraindication to anticoagulation, eg active gastrointestinal bleed or recent neurosurgery.
- Complication of anticoagulation necessitating cessation
- Failure of anticoagulation
- Deep vein thrombosis (DVT).
- Pulmonary embolism
- Trauma patient with high risk of Venous thromboembolism

CONTRAINDICATION

- Complete venacava thrombosis.
- Vena cava is too small or too large to safely admit a filter.
- Septic thromboembolism.

MATERIALS REQUIRED

- Ultrasound machine
- Introducer set
- Multi-slidehole straight and pigtail catheter
- Commercially available venacava filter set.

PATIENT PREPARATION

- Available cross-sectional abdominal imaging should be evaluated for the presence and extent of DVT.
- Availability of venous access sites, typically IJ or common femoral veins, should be assessed.
- Anticoagulation status and platelet level should be assessed to ensure that the patient can safely pursue IVC filter placement.
- Advised to take lite meal and allowed to drink clear liquids on the day of your procedure.

TECHNIQUE

- Venous access – Establish access using ultrasound guidance and seldinger technique. Access site is usually the right internal jugular and a guide wire is placed in IVC.
- Cavography – marker pigtail catheter is positioned at common iliac veins.
- Venogram is performed by injecting contrast through the catheter for patency checking.
- The venous access is dilated using a dilator and filter is deployed in a suitable location through the sheath, typically the infra renal IVC.
- Another venogram is obtained to ensure satisfactory deployment of filter.

COMPLICATIONS

Access Site

- Hematoma
- Venous thrombosis
- Arteriovenous fistula

Immediate

— Failed filter deployment

— Filter malposition

Delayed

— Filter migration

— Filter fracture and embolization

— Filter penetration of the IVC and penetration of adjacent organs

— Caval thrombosis and deep venous thrombosis

IVC FILTER RETRIEVAL

IVC filter retrieval should be considered in patients with optional filters when the period of venous thromboembolism risk has elapsed or systemic anti coagulation has been achieved. Device-related complications like filter fracture, which are often incidentally detected, should also motivate prompt filter removal, to reduce the risk of progression to clinically significant adverse events.

CONCLUSION

IVC filters provide effective mechanical protection against PE in patients with DVT. Indwelling filters are associated with an increased risk of DVT as well as device-related complications such as filter migration and component fracture. IVC filters should therefore be used judiciously, for patients in whom systemic AC is contraindicated or ineffective, and require close clinical follow-up to allow for prompt filter retrieval once the period of venous thromboembolism risk has elapsed.

S13 - ADVANCEMENTS IN ENDOVASCULAR ANEURYSM MANAGEMENT

Blossom Fernandes, MSc MIT, K S Hegde Medical Academy,

NITTE deemed to be university

ABSTRACT

Endovascular Aneurysm Repair (EVAR) is a minimally invasive method to treat an aneurysm, instead of an open aneurysm repair. Endovascular coil embolization continues to evolve and remains a valid modality in managing ruptured and unruptured cerebral aneurysms.

Devices to augment coil embolization now include balloon-assist techniques and intracranial stents to increase coil packing and parent artery patency.

In recent years, novel stents and stent-like devices have been designed to serve as adjunctive treatments for endovascular coiling of wide-neck aneurysm. Temporary neck bridging devices for coil embolisation, such as Cascade and Comaneci, have some advantages over other adjunctive devices.

Recent Advances

1. Balloon Assisted Coiling

   Balloon remodelling used a single low-compliance balloon, limited to sidewall aneurysms. More compliant balloons are now available, and those commonly used for balloon-assisted coiling include:

   - Hyperform and HyperGlide (single lumen)
   - TransForm occlusion balloon catheter (single lumen)
   - Scepter (dual lumen)
   - Ascent balloon

2. Stent Assisted Coiling

   - PulseRider
   - Low-profile Visualised Intraluminal Support (LVIS) and LVIS Jr
   - Neuroform Atlas Stent System
   - Barrel VRD
   - Comaneci
   - Cascade Non-Occlusive Remodeling Net
   - eCLIPS
   - 3D printed vascular models

Advances in Coil Properties

Variety of coil shapes are available from two-dimensional helix to three-dimensional (3D) configurations. Multiple manufactures now offer coil lines with varying degrees of stiffness, from frame building (eg, Target 3D (Stryker Neurovascular (Cerenovus, Irvine, CA, USA)), filling with soft to supersoft and finishing with nanos (eg, Target Nano (Stryker Neurovascular), Axium EX (Medtronic Neurovascular). The addition of nano-type coils with the softest properties and increased conformability offer advantages of treating more challenging, smaller aneurysms or finishing small residual spaces towards the end of coiling procedures. To address larger aneurysms, larger coil diameters combined with significantly increased coil lengths as long as 50–60 cm are now available (eg, Target XL (Stryker Neurovascular) and Penumbra Coil 400 (Penumbra, California, USA)).

S15 - DIGITAL SUBTRACTION ANGIOGRAPHY AND ITS POST PROCESSING TECHNIQUE

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INTRODUCTION:

Digital Subtraction Angiography (DSA) is a special method of fluoroscopic technique used extensively in interventional radiology for visualizing blood vessels. Radiopaque structures such as bones are eliminated (subtracted)digitally from the image, thus allowing for an accurate depiction of the blood vessels.

INDICATIONS:

- Endovascular aneurysm repair
- Arterial balloon angioplasty
- Arterial stenting
- Endovascular embolization
- Thrombectomy

EQUIPMENT:

The Fluoroscopy unit consists of a C-arm unit that can be rotated axially and sagittally around the floating top table. The distance between the x-ray tube and the image intensifier can be adjusted, as can collimation and several other parameters.

- Pulsed fluoroscopy with a variety of frame rates for dose reduction
- Ability to change and display collimation position without fluoroscopy
- Last image hold and frame -grab
- Image enhancement
- Different image manipulations
- Cine
- Measurement and quantification

SUBSTRACTION TECHNIQUES:

- Pixel Shifting,
- Logarithmic Subtraction,
- Rotational Angiography
- Dual Energy Subtraction.

PROCEDURE:

- the patient lies on the angiography table
- local anesthesia is administrated at the intended puncture site.in certain procedure general anesthesia is performed.
- The seldinger technique is used to gain access to a blood vessel.
- On procedure completion, hemostasis is applied to the puncture site.

POST PROCESSING TECHNIQUES OF DSA:

- Road mapping technique
- Fluoroscopy fade technique
- Dynamic 3-D road mapping technique

OBJECTIVE TO ROAD MAPPING:

Commonly used for catheter navigation in endovascular procedures, it is the superimposition of live fluoroscopic images on a previously stored digitally stored angiogram.

APPLICATIONS:

It is useful in the diagnosis and treatment of;

- Arterial and venous occlusions
- Pulmonary embolisms
- Arterial stenosis -renal donors
- DSA is the gold standard investigations for renal artery stenosis.

CONCLUSION:

Despite recent advances in CT angiography and MR angiography DSA remains the standard imaging technique for evaluation of vessels.

S16 - IMAGING OF WILMS TUMOR

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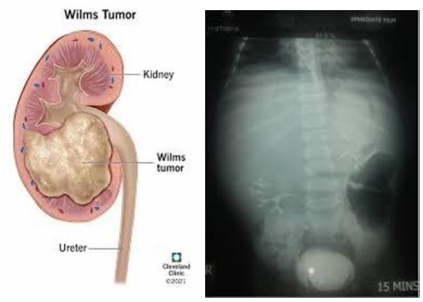
Wilms tumor, or nephroblastoma, is the most common renal cancer in the pediatric age group. It is also the most common pediatric abdominal cancer and the fourth most common pediatric cancer overall. Wilms tumor is typically found in children younger than five years old. The tumor is named after the German physician, Dr. Max Wilms, who first described it in 1899.

Imaging modalities of choices for wilms tumor



Radiography

KUB plain is performed such that Wilms tumors are usually large heterogeneous solid masses which displace adjacent structures.

Procedure

Intravenous urogram is performed to evaluate the wilms tumor designed to depict specific parts of the urinary tract optimally. Portions of the urinary system appear opaque when filled with contrast material.

Computed tomography - Cect urogram

Wilms tumors are heterogeneous soft-tissue density masses with infrequent areas of calcification and fat-density regions. Enhancement is also patchy and allows for better delineation of the relationship between the mass and kidney.

Magnetic resonance imaging of abdomen

MR imaging, NRs are hypointense relative to normal renal cortex on T1-weighted images and iso- to slightly hyperintense on T2-weighted images.

ultrasound

Mandatory first line imaging modality in children. WT typically appears as a large, solid intrarenal mass with smooth and well-defined margins

Nuclear medicine

Bone scans are not routine as the tumor metastasizes to bones very late. F-18 FDG PET/CT is increasingly used as a problem-solving tool and to distinguish scar tissue from residual active tumor.

S17 - DIAGNOSTIC AND PROGNOSTIC ROLE OF MRI IN SPINAL TRAUMA

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Aims and objectives:

To evaluate the role of magnetic resonance imaging (MRI) as a non-invasive diagnostic tool in patients with acute and chronic spinal trauma and to compare and correlate the MRI findings with those of patients' clinical profile and neurological outcome according to ASIA impairment scale to assess prognostic and clinical value of MRI.

Materials and Methods:

Sixty two patients of spinal trauma formed the study group in a prospective fashion. The patients undergoing MR imaging and magnetic resonance images were analyzed and correlated with findings on neurological examination according to American Spinal Injury Association (ASIA) impairment scale (AIS) at the time of MRI examination and subsequently at sub-acute interval to assess neurological outcome.

Statistical Analysis:

Sample profile was described in terms of 95% confidence limit and proportion. To describe strength of association between extent of spinal cord injury and outcome, odd's ratio, bivariate and multi variant analysis, was used. Pearson's chi square $(\chi)^2$ statistics was applied to test the association between two categorical variables. Data were analyzed using statistical software package, STATA 9.2 and the difference was considered to be significant if '*P*' value was <0.05.

Observation and Results:

The cord edema without hemorrhage was the most common MR finding (41.5%). The others were sizable focus of hemorrhage within the cord (33%), epidural hematoma (5.0%), and normal cord (26%). Majority of MR findings correlated well with clinical profile of the patient according to ASIA impairment scale. This study demonstrated that patients with presence of sizable focus of haemorrhage had larger cord edema and more severe grade of initial ASIA impairment scale(AIS) with poor recovery at follow up (*P*=0.032).Improvement in upper extremity was more than lower extremity. Severe cord compression was also associated with poor neurological outcome; however it was not statistically significant (*P*=0.149).

Conclusions:

With this study the authors concluded that various MRI findings in acute spinal cord injury correlated well with the initial clinical findings and on follow-up according to ASIA impairment scale. MRI is useful for initial diagnosis of acute spinal cord injury and its prognostication for predicting neurological recovery.

S18 - SELECTION OF SUITABLE VARIETY OF BANANA AS NEGATIVE CONTRAST IN MRCP

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PURPOSE:

The quality of magnetic resonance Cholangiopancreatography (MRCP) images is frequently degraded by high signal from the gastrointestinal tract on heavily weighted 3D, T2 sequences. Banana juice , which contains manganese, potassium, phosphorus and sodium are paramagnetic substances which suppresses signal in heavily weighted T2 sequences. The purpose of this study is to evaluate and compare different types of banana juice as an oral negative contrast agent in MRCP examination. The scientific names of the main cultivated bananas are Musa acuminaia, Musa balbisiana and Musa paradisiaca (hybrid of Musa acuminata and Musa balbisiana).

MATERIALS AND METHODS:

For this study, we have took different types of bananas (green banana, poovan banana, red banana, ellaki banana, karpuravalli banana and rasthali banana) which are easily available in the market and made them into juices **without adding water**. These juices were kept in small container about 50 ml and then send them for MRI scanning. We did MRCP sequences i.e, heavily weighted T2 sequence and results were analysed. In result, Poovan banana shows lowest MR values, below MRCP T2 200, among all bananas.

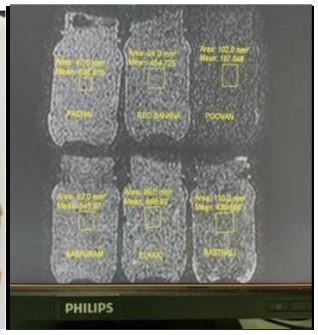
Pilot study was conducted with one volunteer after getting concern, patient was advised to fast overnight and to be nil per oral in the morning before imaging. The patient was subjected to MRCP imaging with standard protocols and the images are recorded. The patient was asked to drink 400ml of Poovan banana juice. Twenty minutes later, the patient was again subjected to MRCP imaging with standard protocols and images were recorded and compared for efficiency of Poovan banana juice. The scientific name of Poovan banana is Musa. Acuminate.

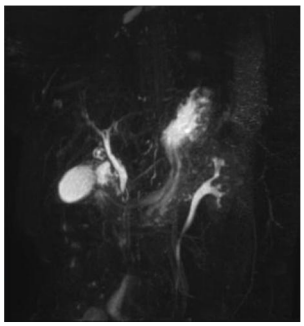
RESULTS:

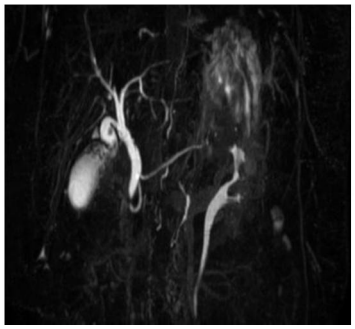
Significant signal suppression was noted in the stomach, duodenum and proximal small bowel with Poovan banana juice. Visualization of the pancreatic duct, and CBD were also noted to be better post ingestion of Poovan banana juice.

CONCLUSION:

Banana juice which has MRCP T2 value below 200 is suitable for MRCP examination. Ingestion of Poovan banana (Musa acuminate) juice provides effective signal suppression in the GI tract on MRCP in 3D heavily weighted T2 Sequences.







Banana juices **MRCP image of banana juices without Poovan banana** **with Poovan banana**

Guided by,

PROF DR. SUBRAMANIYAN. HOD, DEPARTMENT OF RADIOLOGY

ASST. PROF Dr. HARSHAVARDHAN. B

G. YOGANANTHEM, TUTOR

S19 - ONCO IMAGING OF ENDOMETRIUM IN MRI

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ABSTRACT

Magnetic Resonance Imaging (MRI) plays an important role in endometrial and cervical cancer assessment, from detection to recurrent disease evaluation. Endometrial cancer is the most common malignancy of the female pelvis. MRI of endometrial and cervical cancer facilitates patient stratification into treatment groups. MRI acquisition and interpretation errors can lead to diagnostic and staging mistakes. In endometrial and cervical cancer, DWI, and DCE improve staging accuracy and tumor delineation. For both endometrial and cervical cancer, assessing lymph node involvement plays an important role. Compared to CT and MRI, 18fluorine-18 fluorodeoxyglucose PET-CT (18F-FDG PET-CT) is more accurate for the detection of nodal metastasis larger than 10 mm. New concept such as International Federation Of Gynecology And Obstetrics (FIGO 2018) revised its staging to include imaging and pathological findings (staging includes node involvement and thus enables both therapy selection and evaluation, prognosis estimation and calculation). MRI can accurately assess prognostic indicators. E.g. tumor size, parametrial invasion, Pelvic side wall and lymph node invasion. MRI findings aid in planning patients for a more tailored therapeutic treatment with care full applications, MRI with DWI and DCE sequences can help to establish a correct diagnosis. We aim to increase diagnostic accuracy in staging of endometrial cancer with avoiding pitfalls. We present here, The role of Technicians, Identifications, Patient preparation, Planning of sequences and parameters, Avoiding pitfalls and applications of MR imaging of Endometrium.

S20 - MR DEFECOGRAM

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MR Defecogram is a non-invasive dynamic diagnostic procedure performed for the evaluation of pelvic floor and pelvic organ prolapse. This MR Defecogram also helps in evaluating the rectocele incontinence.

INDICATIONS:

- Obstructed defecation / constipation.
- Descending perineal syndrome.
- Dysyeneric defecation.
- Fecal incontinence.
- Internal rectal intussusception.
- External rectal prolapse.
- Anismus.
- Sigmoidocele.
- Enterocele.
- Spastic perineum.

CONTRAINDICATIONS:

- For evaluation of postoperative rectal conditions like coloanal anastomosis.
- Snare polypectomy.
- Suspected perforation.
- Infectious or active inflammatory bowel diseases.
- Pregnancy.
- Weakness of rectal muscles during passing stools.
- Poor body balance/ or improper body balance.

PREPARATION :

The foremost preparation for this MR Defecogram is -

- Patients should be in nil per oral for nearly 6 to 8 hours before performing the
- study.

- Patients should consume a laxative (like dulcolax tablets or coloprep which are preferred by the doctors at their respective op) before the study which helps in evacuating the fecal along with the bowel which helps for preparing the stomach for the study .
- For this study early appointment should be given to the patient .
- Before performing the study the performing technician should clearly explain the performing procedure to the patient. This helps to maintain a good communication and helps in cooperation of the patient during performing the study procedure.

PERFORMING TECHNIQUE:

The performing technique depends upon the case study of the patient The most important thing in this MR Defecogram is,this study is performed in 4 phases,in each phase the movement of pelvic muscles and the abnormalities in the pelvic floor is evaluated dynamically during the procedure with the help of MRI based contrast medium. 4 Phases - Rest, strain, squeeze, defecate/evacuation.

IMAGING SEQUENCE OF MR DEFECOGRAM:

Axial, coronal and sagittal T2W sequence images of pelvis are acquired for assessment of structural abnormalities of the pelvic viscera and musculature. This dynamic study is carried out by acquiring cine images in "Sagittal plane" with TRU-FISP sequence (SIEMENS). This is similar to the sequence used for cardiac imaging. This dynamic sequence are acquired during rest,strain , squeeze and defecation. Prior to the defecation sequence nearly 100 to 200 ml of ultrasound gel is instilled into the rectum via rectal tube.

CONTRAST MEDIUM USED FOR MR DEFECOGRAM:

Ultrasound gel is used as a contrast agent in this MR Defecogram because it is easy to acquire detailed information about abnormalities in the anorectal regions and moreover easy to instill into the rectum via syringe which will be clearly visible during the cine sequences.

CONCLUSION:

MR Defecogram is a useful tool for evaluation of patients with ODS(OBSTRUCTED DEFECATION SYNDROME) and can also demonstrate structural and functional abnormalities of the anorectal regions which act as a guide for surgical procedures.

S21 - MR DYNAMIC CONTRAST ENHANCEMENT TO ASSESS MALIGNANT OR BENIGN WITH HELP OF KINETIC CURVE IN BREAST IMAGING

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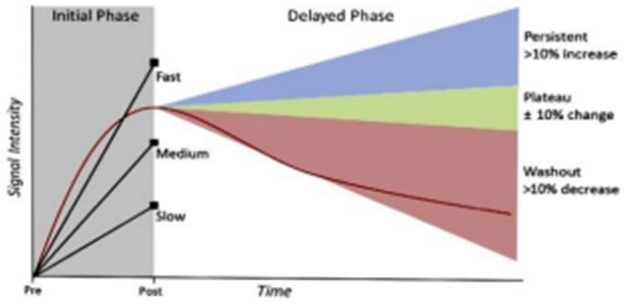
ABSTRACT

The aim of this study was to employ a kinetic model with dynamic contrast enhancement-magnetic resonance imaging to develop an approach that can efficiently distinguish malignant from benign lesions. There can be three possible enhancement (time intensity) kinetic curves for a lesion on breast MRI (these are also applied in other organs such as prostate MRI). These are sometimes termed the Kuhl enhancement curves.

TYPES	TECHNIQUE PATTERN
TYPE 1 CURVE	progressive or persistent enhancement pattern
TYPE 2 CURVE	plateau pattern
TYPE 3 CURVE	Washout pattern

KUHL CURVE



RESULTS

The kinetic modeling curve method showed higher sensitivity, specificity, positive and negative predictive values as compared with the time-signal intensity curve method in lesion classification.

S22 - ROLE OF MR SPECTROSCOPY IN CHARACTERISATION OF BREAST MASSES

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Breast cancer is the second leading cause of death in women worldwide.

INTRODUCTION:

Magnetic Resonance imaging (MRI) identifies the anatomical location of a tumor; MR spectroscopy compares the chemical composition of normal breast tissue with abnormal tumor tissue.

AIM:

To discuss the role MR Spectroscopy in characterizing the various breast pathology.

BASIC OF MAGNETIC RESONANCE SPECTROSOPY

The main purpose of breast ^{1}H-MRS is to help distinguish benign from malignant tumors. The spectra generated from MRS represent all observable metabolites with their individual chemical profiles in the region of interest; the position and characteristics of each metabolite peak are determined by the underlying chemical formulae, and the area under each metabolite peak represents metabolite concentration.

MRS ACQUISITION

Several studies have explored the use of MRS at both 1.5T and 3T. The 3T system yields nearly double the signal-to-noise ratio (SNR) and spacing between metabolite peak locations compared with a 1.5T scanner.

Breast MRS typically performed using surface coils and an SVS Technique with fat suppression and intermediate to long TE values

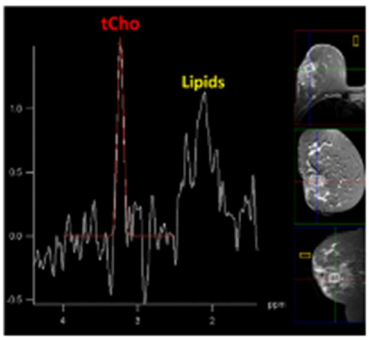
Major peak characteristics of cancer is total choline(tCho) at 3.2 ppm

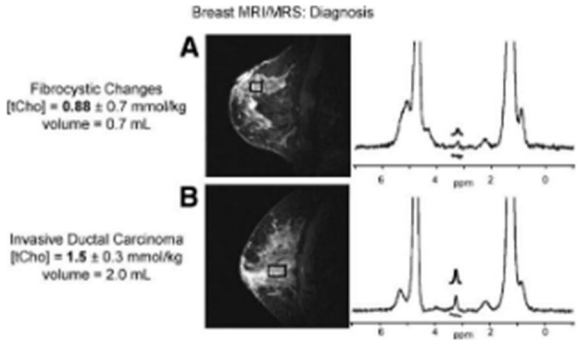
SPECTRA ANALYSIS

This peak is primarily derived from free choline, phosphocholine, and glycerophosphocholine and is commonly referred to as total choline (tCho). Several other compounds including taurine, glucose, phophoethanolamine, and myoinositol also make minor contributions to this resonance. Cho or other metabolites can be quantified using the water signal as well as T1 and T2 relaxation constants to calculate absolute concentrations of metabolites or lipid fractions.

CLINICAL APPLICATIONS

There is now an increasing clinical usage of MRI breast, including screening in high risk and supplementary screening tool in average-risk patients. MRI is becoming imperative in assisting breast surgeons in planning breast-conserving surgery for preoperative local staging and evaluation of neoadjuvant chemotherapy response. Other clinical applications for MRI breast include occult breast cancer detection, investigation of nipple discharge, and breast implant assessment. This review gives a comprehensive overview of the clinical trends of MRI breast with emphasis on imaging features and interpretation using conventional and advanced techniques.





S23 - DIAGNOSTIC EVALUATION OF MULTIPLE SCLEROSIS USING DOUBLE INVERSION RECOVERY SEQUENCE

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GUIDED BY: Prof.DR. SENTHILVELMURUGAN., MDRD

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INTRODUCTION:

Multiple sclerosis is a demyelinating disease that affect the myelin sheath of neuron in the CNS. With the formation of focal and diffuse lesion(plaques).

TYPES OF MULTIPLE SCLEROSIS:

Clinically isolated syndrome(CIS) - It is a first episode of neurologic symptoms caused by inflammation and demyelination.

Relapsing remitting MS (RRMS) - This is common form of MS. It is characterized by clearly defined attacks of new or increasing neurologic symptoms. These attacks also called relapses are followed by periods of partial or complete recovery.

Secondary progressive MS (SPMS) – It occurs when RRMS transitions into the progressive form.

Primary progressive MS (PPMS) – It become progressively worse from the onset of your symptoms.

DOUBLE INVERSION RECOVERY:

DIR is an variant of inversion recovery sequence. It permits obtaining brain white matter or grey matter selective imaging while simultaneously suppressing the signal deriving from one of these tissues and CSF.

DIR uses two 180 inverting pulses and signal obtained with fast spin echo method(FSE). The first inversion time denoted as a TI-1, the second inversion time denoted as TI-2.

WHITE MATTER ATTENUATION IR:

An Appropriate choice of inversion times permits suppressing both CSF and white matter signal to enhance grey matter called White matter attenuation inversion recovery (WAIR).

TI-1 for CSF, TI-2 for white matter. TI-1 obtained at 1700-3500msec, TI-2 obtained AT 320-450msec.

WAIR detecting lesions in different location compared to the FLAIR sequence. It helps to plan disease modifying therapy (DMT) early and to detect the progression disease after initiating DMT.

GREY MATTER ATTENUATION IR:

An Appropriate choice of inversion times permits suppressing both CSF and grey matter signal to enhance white matter called Grey matter attenuation inversion recovery (GAIR).

TI-1 for CSF, TI-2 for grey matter. TI-1 obtained at 1700-3500msec, TI-2 obtained at 500-650msec.

It helps to characterization of Dark Rim Lesion in MS patients.

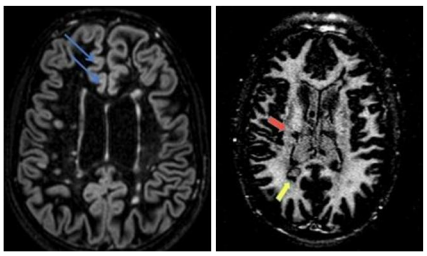
RECENT STUDIES SHOWS:

Dark Rim Lesions are frequent in primary progressive MS patients.

Relapsing remitting MS patients dark rim lesion are associated with a high risk of the disease worsening and secondary progressive MS conversion after 15 years.

CONCLUSION:

WAIR useful to differentiate juxtacortical from mixed grey matter-white matter plaques and detect infratentorial or spinal cord lesion. GAIR useful to estimate the progression of the disease. Hence DIR sequence should be included in the routine MR protocols of MS patients.



S24 - NEWLY DEVELOPED METHODS FOR REDUCING MOTION ARTIFACTS IN PEDIATRIC ABDOMINAL MRI

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AIM:

To provide MR abdomen images free from motion artifact in pediatric population.

OBJECTIVE:

Implementing methods for reducing motion artifacts which are

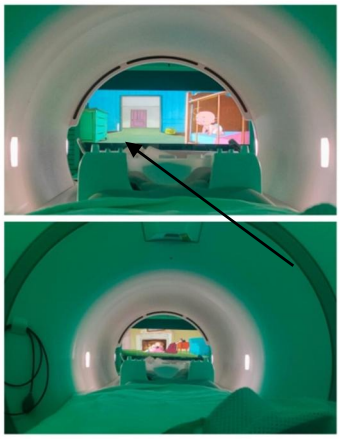
- Parallel imaging
- Compressed sensing
- Motion reduction software
- Flex technique

INTRODUCTION:

One of the main challenges that continues to drive innovation in pediatric imaging is motion (i.e., voluntary motion, respiratory motion). Obtaining good diagnostic images requires the patient to lie still during image acquisition, however, many infants and children are unable to comply with this request for various reasons and often require sedation or general anesthesia. The motion-mitigation methods that may become routine clinical practice to obtain diagnostic quality abdomen MR images in the pediatric population.

Alternative methods used to alleviate gross body motion involve,

- Preparing the child for the examination in simulator environments and distraction techniques used by trained MRI staff and child life specialists.
- Cartoon display is projected in order to make the pediatric patient still, till the scan gets over. Dedicated goggles is used to view this display. (Inbore experience)



- Physiology-synchronized acquisition techniques (e.g., triggering, gating).
- Motion-reducing free-breathing MRI protocols allow the imaging of children while they are awake or distracted using movie goggles or other audio-video options.

CURRENTLY ESTABLISHED TECHNIQUES

Currently available for reducing physiologic motion artifacts in pediatric abdomen imaging.

1. PARALLEL IMAGING

Parallel imaging technique or sensitivity encoding is a technique that fills the k- space more efficiently than the conventional imaging by filling the multiple lines of k- space per TR.

- By under-sampling data, we can speed- up scan time as less data is acquisition plane
- To go faster: Shorter patient breath-hold, functional MRI, MR angiogram, reduce motion artifacts
- To reduce artifacts: Single shot EPI with Exsper (diffusion, DTI)

2. COMPRESSED SENSING

Compressed sensing (CS) is a signal sampling and reconstruction technique that relies on sparsity or compressibility of signals. It uses a limited data set to generate complete images in less acquisition time compared with traditional methods. CS samples k-space signal pseudo randomly with denser sampling near the center, leading to incoherent folding artifacts.

3. MOTION REDUCTION SOFTWARE

- BLADE MRI in abdomen region is possible to reduce image artifacts and obtain better image quality by increasing the k-space coverage with parallel imaging in the same scanning time.
- The BLADE technique has the advantage of central *k*-space oversampling, so that image artifacts are greatly reduced.

4. FLEX TECHNIQUE

LAVA Flex is a 3D, FSPGR imaging technique that generates water only, fat only, in phase and out of phase echoes in one single acquisition that is typically completed in single breath hold. This technique provides excellent homogeneous fat suppression over the entire field of view, including areas that are difficult to image using conventional fat suppression, due to magnetic susceptibility effect.

CONCLUSION:

A Clear understanding of the strengths and limitations of motion reduction methods can enable practitioners of pediatric abdominal MRI to select and combine the appropriate techniques and potentially reduce the need for sedation and anesthesia.

S25 - A PRACTICAL APPROACH TO OPTIMIZE PATIENT DOSE IN CT

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INTRODUCTION:

Usage of ionizing radiation on patients should be done judiciously keeping in mind the risk associated with it. All the ways and means to keep the radiation dose to the patient As Low As Reasonably Achievable (ALARA) shall be adopted and at the the same time yield the required outcome.

AIM:

To reduce radiation dose to the patient undergoing CT and the same time to maintain diagnostic confidence.

WORK PRACTICE:

Atomic energy regulatory board approved good work practice of using ionizing radiation shall be followed to reduce the radiation dose to the patient.

- Adequate scan length
- X ray beam filtration
- Peak voltage
- Tube current modulation
- Paediatric protocol
- Pitch factor noise
- Shield critical organs

CONCLUSION:

Clinical management of the patient is obtained with the lowest practicable radiation exposure. Education and training programs should be conducted on the implementation of radiation dose reduction techniques. Moreover, in order to avoid getting poor quality image and going for a repeated radiological investigations, which in turn gives excessive dose to the patient, active implementation of Quality Assurance / Preventive maintenance tests of the machines and fault reporting system should be made possible in all medical centres.

S29 - MYOCARDIAL PERFUSION IMAGING IN PET

Shinduja.R

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Abstract

Myocardial perfusion imaging(MPI) in PET allows accurate measurement of myocardial perfusion, absolute myocardial blood flow and function at stress and rest in a single study performed in approximately 30 min. Various PET tracers are used. it has high diagnostic accuracy for obstructive coronary artery disease. CardioVascular disease causes more burden in worldwide. patient radiation dose can be reduced and image quality can be improved with latest advances in PET-CT. By hybrid PET CT both anatomy and perfusion can be assessed. shorter examination time period for detection of coronary artery disease. In this presentation, brief explanation of cardiovascular disease, riskfactors, symptoms, patient based approach, patient preparation, imaging protocol, image processing.

S 30 - ROLE OF MRI IN ASSESSMENT OF VALVULAR HEART DISEASES

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Objectives:

This article will review the current technique in cadiac magnetic resonance imaging (cmr) for diagnosing and assessing primary valvular heart disease. The recent advancements in cmr have led to an increased role of this modality for qualifying and quantifying various native valve diseases. Phase – contrast velocity encoded imaging is a well established technique that can be used to quantify aortic and pulmonic flow.

Methods:

With the aging population and greater survial of patients with heart failure, more patients with are suffering from complications related to valvular heart disease. Up to 11.7% of people 75 years or older in the usa are afflicted by moderate to sever valvular heart disease [1] cardiac magnetic resonance imaging (cmr) provides a comprehensive evaluation of cardiac anatomy, function, and myocardial tissue characterization and is incsreasingly being used assess valvular heart disease.

Results:

CMR poses similar advantages and disadvantages for evaluation of the tricuspid valve as described above for evaluation of mitral regurgitation. dephasing allows for visualization of a vena contracta and >7mm infers severe regurgitation [2., 67]

Conclusion:

While in the past the role of CMR was isolated to situation where echocardiographic assessment was inadequate, cmr is playing an increasingly important role in the assessment of valvular heart disease. CMR cine imaging remains the gold standard for measuring left and right ventricular volumes and function provinding essential information regarding ventricular remodeling in response to valvular heart disease.

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