

Welcome

On behalf of the Scientific Committee I would like to invite radiographers from around the world to attend the 3rd EuroMed Congress for Radiographers. Our meeting will be held between 16th -18th April 2010 at the Holiday Inn Lisbon Continental Portugal.

Two of the most regarded and effective components of the meeting continue to be the proffered papers and poster presentations. The poster exhibition will be a key event throughout the 3 day program. This is a great opportunity to meet other registrants and see the outstanding quality of work your colleagues are producing; both in scientific and clinical environments. The meeting program allows for several oral presentations by researchers and invited speakers.

This program also offers a diverse range of Workshops including Evidence Based Practice, Radiation Protection, Writing for Publication, Research Clinical Audit, Plain Film Reporting and Workshop by Covidien. These workshops serve as a tool for radiographers as they travel through the research process.

The E-MCR General Meeting will be held on Sunday. This is an open session for members and non-members to attend and learn what the E-MCR is doing to further its mission and goals. Participants can observe the activities of the E-MCR over the previous year and the goals for the upcoming year. This is an important part of the meeting where you get to voice your questions/ opinions. Fully-paid members will also have the opportunity to take an active role in the development of E-MCR. Your attendance at this meeting is valuable to the E-MCR to continuously improve our network through membership and allowing the E-MCR to increase its ability to evolve further as an important European resource.

The E-MCR was established to provide continuous educational opportunities for radiographers as well as a forum for members to collaborate with and learn from each other. In addition, this year the program focuses on the Research Process and tools required by radiographers to publish their own work. We are very proud that we have our own peer reviewed journal ***The European Journal of Radiography***, which provides you with an opportunity to publish your own work and at the same time serves to promote our profession by making that information available to others.

The EuroMed Congress for Radiographers is dedicated to provide these numerous important objectives and it is our pleasure to welcome you in Lisbon this April for a celebration of Medical Imaging.

Joseph Castillo B.Sc, M.Sc(HCM), M.Sc(MRI)

Scientific Committee Chair

Friday 16th APRIL

MRI Program

08:30 – 10:10 *Magnetic Resonance Imaging 1*

MR 01

Cardiac MRI - First Steps

Ruben TEIXEIRA

Faculty of Medicine, Hospital de Santa Maria, Lisbon, Portugal

Objectives:

1. Localisation of the Heart
2. Clinical Cases
3. Visualisation of the Heart

MR 02

Cardiac MR: Practices and Clinical Cases

Ana ALMEIDA

Faculty of Medicine, Hospital de Santa Maria, Lisbon, Portugal

Abstract

Not submitted

10:30 – 12:20 *Magnetic Resonance Imaging 2*

MR 03

Diffusion tensor imaging: basic principles and clinical applications: Clinically useful tool or just a pretty picture?

Sophia REIMAO

Hospital de Santa Maria - Neurological Imaging Department

Abstract

Magnetic Resonance diffusion tensor imaging (DTI) is a promising technique based on the diffusion of water molecules and its orientation-dependence: there is greater resistance to diffusion across a white-matter fibre bundle than along it. By acquiring multiple images, each sensitive to diffusion at a different orientation, a diffusion tensor can measure and quantify the mean diffusion, and its orientation dependence ('fractional anisotropy') for each voxel.

DTI has provided a non-invasive tool to image white-matter fibre bundles in the human brain in vivo, allowing direct examination of the brain microstructure.

From a research tool DTI has moved to the clinical setting showing its value in the understanding of the anatomy, fiber connectivity, and brain development. It has increasingly been used for the investigation of a wide range of brain pathology, such as cerebral ischemia, trauma, MS, dementias, epilepsy, brain tumors and metabolic disorders.

However the interpretation of DTI is still complex, requiring knowledge of its physical principles and technical limitations.

Further improvement in the technique and stable postprocessing analyses are needed for future research and clinical applications of DTI.

Objectives:

1. Review of the basic principles of Diffusion tensor imaging (DTI)
2. Main applications of DTI in clinical practice
3. Limitations of the technique
4. Future prospects and goals

MR 04

ASL perfusion imaging: principles and applications

Patricia FUGUEIREDO

Instituto Superior Técnico, Technical University of Lisbon, Portugal

Objectives:

1. Basic principles of arterial spin labeling (ASL)
2. Most important ASL methods.
3. Acquisition parameters and physiological measures.
4. Main advantages and limitations.
5. Applications in functional neuroimaging

14:00 – 15:40 *Magnetic Resonance Imaging 3*

MR 05

Fetal MR: optimization of technique and study protocol

Antonello De Lutiis, Daniele Petrucci, Fabio Careri, Darien Garcia Calvo, Caulo Massimo, Armando Tartaro

I.T.A.B. University of study "Chieti-Pescara", Chieti scalo, Italy

Abstract

Fetal MRI is an increasingly used technique for prenatal diagnosis of malformations and other pathological conditions of the fetus.

Due to its low invasiveness, high contrast resolution and multiplanarety and ultrafast sequences, MRI imaging can be used as a second level examination after ultrasound.

The aim of this work is to define a fetal MRI protocol which considers technical problems related to the MR examination (ultra-fast sequences to reduce motion artefact, critical SAR level) and to the patient (positioning in the scanner and preparation).

T2 and T1 ultra-fast sequences were optimized to obtain an appropriate contrast between different tissues of the fetus having structural characteristics different from adults.

The efficacy of a lateral decubitus and glucose deprivation of the mother to improve images quality was tested.

Objectives

The aim of this work is to define a fetal MRI protocol which considers technical problems related to the MR examination (ultra-fast sequences to reduce motion artefact, critical SAR level) and to the patient (positioning in the scanner and preparation).

MR 06

Characterization of the Radiological Technician's Knowledge about Safe MR Practices

Margarida Ribeiro¹, Alexandra Nunes¹, Cristina Gois¹

¹ESTeSL, Lisbon, Lisbon, Portugal, ²ESTeSL, Lisbon, Lisbon, Portugal

Abstract

Magnetic Resonance (MR) has suffered a great and fast evolution since its clinical application in the late 70th. Accompanying this progress occurred a concomitant modification of the degrees and even types of hazards associated with magnetic resonance environments, devices and examinations. Taking into account that the Radiographers are the main responsible for the safety of all that use the area of the MR equipment, with this study, we want to analyze the current knowledge of 40 Radiographers of ten hospitals in the Lisbon area about the MR safe practices, through the application of a questionnaire organized by eleven questions of closed answer.

The response rate was 90% and the results point to some Radiographers knowledge about safe MR practices, since that 33,3% of Radiographers only responded correctly to [0-3] questions and 66,7% to [4-7] questions, unable to any element of the sample respond correctly to [8-11] questions (mean of correct answers = 4,25).

Thus, to achieve a higher level of knowledge admits to be essential training on safe MR practices, a continuous updating of knowledge and the development of a culture of patient safety.

Keywords: Safety Practices, Magnetic Resonance, Radiographer

Objectives

1. identify the needs of technicians in radiology for the knowledge of safety practices in RM and some factors which may be in your home.
2. identify training needs in this area and alert the competent structures such as schools, scientific societies and associations.
3. raising the awareness of Technical Radiology of the importance and relevance of the safety of both the patient and of all professionals in contact with the RM.
4. Stimulating interest in the training of technicians in radiology and to subsequent instruction, for them, patients and other professionals working in contact with RM.

MR 07

3T MRI in Evaluation of Asbestos-related Thoracic Diseases

Janez Podobnik¹, Igor Kocijancic¹, Ksenija Kocijancic¹, Igor Sersa¹

¹Institut of Radiology, University medical centre, Ljubljana, Slovenia, ²Jozef Stefan Institute, Ljubljana, Slovenia

Abstract

3T high-field magnetic resonance imaging (MRI) scanners have recently become available for clinical use and are being increasingly applied in the field of whole-body imaging and chest imaging as well.

Fifteen patients with asbestos-related thoracic disease (ARTD) (5 with benign form, 10 with malignant pleural mesothelioma) were scheduled for 3T MRI. Patients with MPM were also scheduled for CT examination with contrast media and from the patients with benign form of ARTD their last CT examination in digital form was acquired.

MR studies were performed with Trio team system (Siemens, Erlangen, Germany). Protocol of MR imaging consist of T2-weighted cardiac-gated breath-hold turbo spin echo (TSE) sequences in coronal, sagittal and axial plane and T1-weighted cardiac-gated breath-hold TSE black blood in axial plane. In T2-weighted sequences in axial plane, fat saturation was also used.

CT examinations were obtained with Somatom 16 or Definition scanners (Siemens, Erlangen, Germany) with administration of the contrast medium.

MRI and CT examinations were assessed by two radiologist experienced in chest imaging. The MRI signal intensity of lesions and intercostals muscles on Syngo MultiModality Work Place was measured. The results of our study show that 3 T MRI enables accurate determination of ARTD changes and it can be used for imaging of patients with ARTD. MRI is particularly valuable because the patient is not exposed to harmful radiation, which is important if imaging methods are used repeatedly, i.e., screening programs or monitoring of MPM treatment results.

Keywords: 3T, magnetic resonance imaging, asbestos

Objectives

1. To evaluate the diagnostic potential of 3 T MRI in assessing pathological changes of asbestos-related thoracic disease.
2. To establish and optimize the MRI protocol for chest imaging in our institution.
3. To introduce MRI a promising imaging modality in chest examination.
4. To lower the radiation dose in imaging of patients with asbestos-related thoracic disease.

MR 08

Safety in Magnetic Resonance (MR): Measuring Missile Effect from Attraction Force in 0.5, 1.5 and 3T Magnetic Field Strengths.

Margarida Figo¹, Margarida Ribeiro¹, Rúben Teixeira², Luis Lança¹

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²Imaging Department, Luz Hospital, Lisbon, Portugal

Purpose: This study evaluated: the missile effect of ten metallic objects in different static magnetic field (SMF) devices, the safety distance for handling them and the projectile characteristic which mostly affect the force objects are attracted. Additionally, we intend to develop a safety MR culture in Portugal.

Materials and Methods: Ten objects with different magnetic susceptibility, mass and shape were tested for missile effect. Components were: 3 house keys, 3 coins, 1 scissor, 1 clamp, 1 stethoscope and 1 clothes tweeze. SMF interactions were measured with 0.5-Tesla, 1.5-Tesla and 3-Tesla MR systems. The attraction force was evaluated using a digital dynamometer. Tests were performed at 0.50, 0.88, 1 and 2 meters from the magnet isocenter. Attraction force and was calculated based on the formula $F = m \times a$.

Results: Average attraction force was higher in 3T than in 0.5T at 0.88m ($p < 0.05$) and 1m ($p < 0.05$), and higher in 1.5T than in 0.5T at 0.50m ($p < 0.05$). One house key was the most attracted object. Object's main metallic composition was significantly related with attraction force at 0.50m ($p < 0.05$), 0.88m ($p < 0.01$) and 1m ($p < 0.05$). Carbon was the most attracted metallic component, followed by chromium and steel.

Conclusion: Objects mainly constituted by brass or Nordic gold are not attracted at any distance in the MR environment. Safety distances for metallic objects in the MR room should be established not only based on the objects mass, but primarily on object's main metallic composition.

Keywords: missile effect; metallic projectiles; MR safety; safety distance; magnetic resonance.

Objectives

1. Alert to the existence of invisible and not intuitive risks in MR environment.
2. Cooperate in the promotion of security in the MR environment, mainly focusing in the patient and health professionals.
3. Demonstrate the differences in attraction force between different static magnetic fields to established minimal safety distances for specific magnetic components.
4. Indicate which projectile characteristic mostly affect the attraction force.

MR 09

MRI ARTIFACTS

Vasileios Syrgiamiotis, Ioanna Nikolaou, Nikolaos Kapernarakos, Aleksandra Sanida, Georgios Zervas, Nikolaos Plataniotis, Ilias Abatzis
Society Of Radiological Technologists Of Hellas ,Graduates Of The Technologic Educational Institutions, Athens, Greece

Abstract

We are going to present some cases regarding the patient movement during the sequence of a magnetic resonance (MR) examination. The patient movement undoubtedly causes an image artifact.

An image artifact is a structure not normally presented but visible as a result of a limitation or malfunction in our MR image. Afterwards we will be able to inform you about proposals, using them, one can perform an MR examination, avoiding the previous artifacts.

The patient movement artifacts are going to be divided in two different categories: the conscious and unconscious movements. According to the conscious movements we indicate various body parts motions, respiratory motion in the abdomen, breath movements, swallowing and a non ordinary case where the patient leaves the magnet. The unconscious movements include uncontrolled coughing, peristaltic motion in the female pelvis, cardiac motion and movements of body fluids during the sequence.

In spite of existing, frequency encoding, field of view and rectangular field of view, respiratory triggering such motions, the medical technician radiologist (MTR) using the appropriate factors can perform an MR exam in order to reform and improve the image quality. We briefly mention breathhold sequences (VIBE, Bh), fat saturation and intravenous injection of an anti-spasmodic. Last but not least the communication and co-operation between the patient and the MTR should be above all.

Keywords: MRI imaging artifact

MR 10

Black blood T2 star for myocardial iron assessment: a new sequence with many technical and clinical advantages.

Francesco De Biase, Sabatino Di Meo, Lucia Di Marzo, Antonio Mangiapia, Malgorzata Beata Studzinskama, Francesco Palmieri
U.O.C. Radiodiagnostica e radiologia interventistica Direttore Dr. A. Ragozzino, Pozzuoli (Na), Italy

Background: The unique non-invasive method for cardiac iron overload measurement is T2 star sequence and actually bright blood T2* is the universally accepted method for the evaluation. Many limits of this technique such as timing related motion artifacts, poor contrast, blood signal artifacts and partial volume effect, produce unsatisfactory images for myocardial iron measurements. The aim of our study is to illustrate the advantages of breath-hold T2 star black-blood sequence.

Materials and Methods: The breath-hold black blood spin echo T2 sequence was installed with the following protocol on 1,5 Testa MR scanner: a four element cardiac phased array coil to image a single 10 mm mid-ventricular short axis slice at 12 echoes times (ranging from 4.8 ms to 163.2 ms, increment 14.4 ms) with ECG gating. Double inversion recovery pulses were applied to suppress the blood signal. A region of interest (ROI) was chosen in the left ventricular septum individually. The mean signal intensity of ROI was measured for each of the images, and the data were plotted against the TEs to form a decay curve, and obtain T2 measurement.

Results: The breath-hold black blood spin echo T2 sequence showed improved contrast, clearly defined borders, reduced blood signal artifacts and minimum partial volume errors, compared with classical bright blood sequence. ROI measurements of both sequences were not statistically different.

Conclusion: The breath-hold black blood myocardial T2 technique is a valid alternative technique to bright blood sequence for iron overload measurement.

Keywords: Black blood T2 star; Cardiac magnetic resonance; iron overload assessment

Objectives

1. Illustrating structural features of a new cardiac MR sequence
2. Illustrating image improvement of black blood spin echo T2 sequence
3. Illustrating limits of this sequence
4. Illustrating potential adjustments of black blood spin echo T2 sequence

Radiotherapy Program

08:30 – 10:10 Radiotherapy 1

RT 01

An Experience with IGRT in a Portuguese Centre

Catarina Pragana

Hospital CUF Descobertas, Lisbon, Portugal

Purpose: Precision and accuracy are a significant step towards best quality in radiotherapy. The Radiotherapy Department decided to improve the imaging system through Image Guided Radiotherapy (IGRT) which provides 3D images of patient's anatomy during treatment. This presentation describes our experience with implementation of new linear accelerator with Cone-Beam CT (CBCT), sharing our difficulties, doubts and solutions.

Materials and methods: First treatments with this new equipment were delivered February 2007. Previously clinicians, radiographers and physicists evaluated relevant factors related to the system validation, set-up accuracy, imaging protocols and workflow. In the clinical practice intra and inter-fraction variations are daily registered and analysed to ensure better control of organs filling, deformation, motion, regarding the target position.

Results: According to validation, 3D verification proved to be consistent with standard Portal Image verification (2D), regarding bone anatomy. Even though 3D acquisition for verification requires more time than 2D, the CBCT seems an improved imaging tool as it allows the treatment isocenter correction by soft tissue size, shape and position. New strategies were introduced to minimize inter, intra-fractional variations (e.g. control organs filling) and to achieve better image quality, i.e. the CBCT presets (e.g. filters, kV and mAs).

Conclusion: An optimized IGRT workflow allows us to treat patients with high level of accuracy and safety, resulting less toxicity, better tumour control and treatment outcomes.

The benefit of these results could lead to reduce margins previously set, further investigations on dose escalation treatment schedules and other conformational techniques.

Keywords: Image Guided Radiotherapy; Cone-Beam CT, 3D Verification

Objectives

1. Share the experience with the implementation of a new LINAC with CBCT.
2. Show all the steps since the beginning to move forward.
3. Share our difficulties, doubts and solutions until the daily use of Image Guided Radiotherapy.

RT 02

Quality Assurance of a CT-scanner dedicated to Radiation Oncology simulation

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Introduction - The purpose of this study is the description of a comprehensive quality assurance (QA) program of the CT-simulator (Computed Tomography) Brilliance Big-Bore (Philips Medical Systems, The Netherlands) installed at the Radiotherapy Department of the University Hospital in Udine.

Materials and methods - The Brilliance Big-Bore CT-simulator consists of a multi-slice CT characterized by a gantry's aperture size of 85 cm with a 60 cm scan field of view, a carbon flat table top, a mobile lasers system (Gammex Inc, USA) and a quick virtual simulation software (tumor LOC contouring).

Our QA program includes verification procedures for CT-scanner, dosimetric performance, simulation software, accuracy of the patient marking system and the overall process. Image quality measurements were accomplished as by using a manufacturer-supplied phantom following the manufacturer's suggested tests, as an independent phantom (CATPHAN 600, The Phantom Laboratory, USA). Accuracy of table movements and lasers were checked employing the test-device described in the guidelines set out by AAPM

Results - All image quality parameters were resulted within acceptable diagnostic levels. The stability of linearity between electron density and CT-number was studied acquiring measurements for one month.

Conclusion - The imaging performance and mechanical integrity of the CT-simulator Brilliance Big-Bore were evaluated and a severe QA program was developed for CT-scanner and CT-simulation process. Since the core of CT-simulation is the processing of patient images in the virtual simulation software, periodic quality tests are essential for maintaining optimum image quality and patient care.

Keywords:: quality assurance, virtual simulation software, radiation oncology, multi-slice CT

Objectives

1. The development of a comprehensive quality assurance (QA) program of the CT-simulator ;
2. evaluation of the constancy and uniformity of CT numbers during the overall working day;
3. tests of the accuracy of the patient marking system for setup reproducibility;
4. evaluation of the principal standard image quality parameter.

RT 03

Patient Safety in Radiotherapy- beyond Radiation related incidents

Ana Furtado, Carina Ramos, Joana Barbosa, Margarida Eiras
Escola Superior de Tecnologia da Saúde de Lisboa, Lisboa, Portugal

Propose: According to WHO, an error in radiotherapy is every process where exists a failure to carry out a planned action as intended, or the application of an incorrect plan. It isn't exclusive of radiation procedures, but as we review reporting systems used in radiotherapy, it's clear that they only cover radiation and exposure accidents. Patient safety cannot be constrained to these events.

It's our propose to reinforce the need for reporting systems in radiotherapy departments and the concept of "organization with a memory", and highlight the importance of a safety culture and reporting events, other than radiation related, which influence patient safety.

Materials Literature review (Med-line, last 5 years), analysis of Radiotherapy related reporting systems: ROSIS IRID, RADEV, EURAIDE and RELIR.

Results: Reporting systems are based on patient, professionals and public exposure. However, in Radiotherapy, accidents unrelated to incorrect radiation exposure do exist and threaten the patient. With a safety culture, these errors are effectively detected and reported.

Conclusion: Radiotherapy departments need reporting systems including non-exposure related errors. They're under the influence of a set of factors that lead to a major exposure of the patient to dangerous or injurious conditions. A safety culture in the organization allows minimizing the exposure to these conditions and intercepting failure on its earlier form, preventing smaller, although frequent, incidents and reducing severe incidents accidents. It will therefore lead to a better performance of health professionals and increase patient's trust in the health care system.

Keywords: Radiotherapy, Patient Safety, Safety Culture, Reporting Systems

Objectives

1. Reinforce the need t report radiation non-related accidents.
2. Contribute to improve Reporting Systems in Radiotherapy.
3. Demonstrate how the application of adequate reporting systems leads to the improvement of the Radiotherapy departments.
4. Explore the advantages of safety culture in Radiotherapy departments.

10:30 – 12:20 *Radiotherapy 2*

RT 04

MR guided HDR prostate brachytherapy: methodology and future prospectives

Csaba Vandulek, John Pall, Ferenc Lakosi, Gergely Antal, Janaki Hadjiev, Peter Bogner, Imre Repa
Kaposvar University, Health Center, Kaposvar, Hungary

Introduction: The aim of this presentation is to demonstrate the feasibility of transperineal MR-guided high-dose-rate prostate brachytherapy with a 0.35T open-configuration MR scanner and to present our initial clinical experiences.

Methods: The clinical procedures were performed with an open configuration low field, 0.35T MR scanner. Lateral decubitus patient positioning was consistently used using the standard 9inch GP coil for imaging the pelvic region. For interventions, an MR compatible Template-Obturator-Device was used supplemented with a patient tray. MR compatible catheters were implanted using MR guidance. A pilot

study using fractionated boost therapy (1 implantation, 2 treatments) was undertaken which involved securing catheters, repositioning of patient and change in imaging coil.

Results: Image quality improved with the use of the pelvic coil. Depiction of the zonal prostate anatomy and neurovascular bundles improved. Patient repositioning requires extra care and time, however, this allows long term patient comfort without catheter displacement. Preliminary results facilitate this technique for implementing fractionated boost therapy with a 6 hour delay time between treatments.

Discussion: The methodology of MR guided HDR prostate therapy has been adopted in the clinical practice at our Institution. The early results of our boost therapy are promising allowing two treatments in one day following the interventional procedure. Strict quality control protocols supplemented with further experience will result in finalising the HDR brachytherapy treatment of prostate carcinoma at our Institution

Keywords: MRI, intervention, radiotherapy

Objectives

1. Demonstrate new methodology used in treating prostate carcinoma
2. Demonstrate radiographers role in MR guided interventional procedures
3. Provide initial clinical results of HDR prostate brachytherapy using the new methodology
4. Demonstrate radiographers role in maintaining QA standards in imaging procedures

RT 05

The irradiation technique of the craniospinal axis in our Institution

Endre Solymos, Janos Pall, Andrea Farkas, Arpad Kovacs, Janaki Hadjiev, Peter Bogner
Kaposvar University, Health Center, Kaposvar, Hungary

Introduction: In our presentation we are going to demonstrate the irradiation technique of the craniospinal axis, that is used at our Institution. This irradiation technique is currently rarely used in the daily clinical routine. Irradiation of the whole neuroaxis is needed dominantly in the case of young adults who are diagnosed with cancer of the central nervous system (CNS).

Methods and Results: For positioning we apply a combined thermoplastic fixing of the mask using a vacuum-bed and carbon fiber base plate. The irradiation treatment follows the CT based 3D planning in all situations. The critical point of the treatment is the irradiation of the matched brain and spine fields, which are solved by the gradual opening-closing of the matching fields.

Discussion: This technique is a challenge for the participating radiographers, the radiation oncologist, the physicist, the patient.

Apart from the challenge of precise field-matchings, the radiographers play an important role in careful patient positioning and maintaining reproducibility of the treatment. An important factor contributing to the success of the treatment is to provide maximum patient comfort taking into consideration that the treatment tolerance level of children is lower than for adult patients.

Keywords: Radiotherapy, CNS disorders, craniospinal axis, therapeutic radiography

Objectives:

1. Demonstrate a radiotherapy technique used for treating the craniospinal axis
2. Emphasize the need of extra attention when treating young patients
3. Demonstrate role of radiographer in non routine therapeutic procedures
4. Demonstrate useful techniques for maintaining patient comfort during radiotherapy

RT 06

Treatment of head-neck cancer patients using Conpas technique in the daily practice: A technical analysis

Karoly Nagy, Andrea Farkas, Arpad Kovacs, Peter Bogner
Kaposvar University, Health Center, Kaposvar, Hungary

Aim: In modern 3D based radiotherapy of head neck cancer patients Conpas is an alternative parotids sparing technique to IMRT. In our institution this technique has been used routinely since 2006. The aim of our study was to analyze the complex technical aspects of this treatment modality in the daily routine.

Patient and methods: Of the 180 patients with head-neck cancer administered to our institution, 96 ConPas plans (with 6 to7 fields) were made and a total of 83 patients were treated with this technique. An elective dose of 50,4 Gy was prescribed to the primary tumor and the bilateral neck node regions, followed by a simple two field boost to the primary tumor region (up to 70Gy). We analyzed the following factors related to this method: time consumption of the planning and the treatment, accuracy of the positioning.

Results: The elective dose of 50,4 Gy was achieved in all cases. The mean dose of primary tumors was 65,8 Gy. The mean planning time was 1,5 hour (range:1,2-2,1) , the mean treatment time was 12 min 43 sec (range: 9 min 05 sec- 20 min) Minor positioning errors were administered during the treatments (Mean AP: 0,27cm, mean ML: 0,1 cm, mean CC: 0,37cm).

Conclusion: Conpas is a real and usable alternative of IMRT in the treatment of head-neck cancer patients. After the learning curve, with precise patient selection and immobilization, the planning process and the treatment means moderate time consumption for the treatment staff.

KEYWORDS: Head-neck, radiotherapy, Conpas, side effect

Objectives

1. Show the usefulness of the Conpas technique in the treatment of head-neck cancer patients
2. Show the radiographers role when administering this technique
3. Describe the methodology of the Conpas technique
4. Outline the results of this non routine radiotherapy technique at our Institution

RT 07

Side effect analysis of the Conpas technique in the treatment of head-neck cancer patients.

Barbara Bekesi, Zoltan Kovacs, Andrea Farkas, Arpad Kovacs, Janaki Hadjiev, Peter Bogner
Kaposvar University, Health Center, Kaposvar, Hungary

Aim: In the modern 3D based radiotherapy of head neck cancer patients Conpas is an alternative parotids sparing technique to IMRT. In our institution this technique has been used routinely since 2006. The aim of our study was to analyze the side effect profile of this treatment method.

Patient and methods: Between 01.07.2006 and 31.11.2007, 180 patients with head-neck cancer were administered to our institution. During this period 96 ConPas plans (with 6 to7 fields) were performed and a total of 83 patients were treated with this technique. Acute side effects (xerostomia, swallowing, taste feeling, dermatitis, and mucositis) were registered and analysed during the treatment period. Weight changes were also studied and administered.

Results: The elective dose of 50,4 Gy was achieved in all cases. The mean dose of primary tumors was 65,8 Gy. The mean body mass change was -5,38 kg (-8,13%). In 179 cases Grade I, in 162 cases Grade II, in 28 cases Grade III side effects were registered.

Conclusion: Conpas is a feasible and optimal alternative of IMRT in the treatment of head-neck cancer patients. With the use of this technique a comparable side effect profile can be achieved to IMRT treatments.

Keywords: Head-neck, radiotherapy, Conpas, side effect profile

Objectives

1. Show the radiographers role in the rarely used Conpas technique
2. Review the possible side effects and techniques used to minimise the side effects
3. Demonstrate the radiographers role in the radiotherapy of patients with head-neck cancer
4. Compare the advantages and disadvantages of Conpas techniques and IMRT

RT 08

QA in the 3D radiotherapy treatment planning process-radiographers aspect

Daniel Gugyeras, Csaba Glavak, Gergely Antal, Arpad Kovacs, Csaba Vandulek, Peter Bogner
Kaposvar University, Health Center, Kaposvar, Hungary

Introduction: 3D based radiotherapy plays important role in the complex treatment of cancer patients. The 3D based planning process is a highly standardized method. In our institution, 3D based radiotherapy has been used since 2002. Quality assurance (QA) is essential in this therapeutic planning activity. Our aim was to demonstrate the radiographers and dosimetrist's role in this process. We also present our QA program results.

Methods: In our institution more than 95% of patients receive 3D based radiotherapy. In the planning process (presimulation, Planning CT scan, contouring process, planning, resimulation, verification) radiographers and dosimetrists provide a well defined support activity. According to the protocol their responsibilities are the following: image registration, contouring of the organs at risk (OR), preplanning and verification. Using a 5 step QA control, all plans are controlled and supervised.

Results: Between 01.10.2007 and 01.10.2008, 1430 3D plans were made and the QA process were analyzed retrospectively. A total of 115 cases (8%) re-planning was indicted. The reasons were the following: PTV (planning target volume) contouring modification 22 cases (1,5%); unscheduled planning (predominantly "acute" planning) 70 cases (4,9%), treatment plan modification 23 cases (1,6%).

Conclusion: Our QA program provides an opportunity to reduce possible mistakes in the planning process. Our goal is to reduce the re-planning rate to 5% or lower. Radiographers and dosimetrist have an important role in the QA process of treatment planning.

Keywords: Dosimetrist, Quality Assurance, Radiotherapy, treatment planning

Objectives

1. QA analysis of radiographer's work in treatment planning
2. Demonstrate the role of radiographer's in treatment planning
3. Analyse the indications of re-planning and produce guidelines for limiting the occurrence of re-planning
4. Review the QA standards used in the work of radiographers and dosimetrists

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Nuclear Medicine Program

14:00 – 15:40

Nuclear Medicine 1

NM 01

Clinical Applications of PET/CT

Prof Dr Nese İlgin Karabacak

Department of Nuclear Medicine; Gazi University Medical School, Ankara, Turkey

Abstract:

The imaging of specific molecular targets that are associated with cancer should allow earlier diagnosis and better management of oncology patients. Positron emission tomography (PET) is a highly sensitive non-invasive technology that is ideally suited for clinical imaging of cancer biology, in contrast to anatomical approaches. By using radiolabelled tracers, which are injected in non-pharmacological doses, three-dimensional images can be reconstructed by a computer to show the concentration and location(s) of the tracer of interest. The advent of combined PET/CT scanners in clinical imaging practice has brought advantages as well as their own specific pitfalls and artifacts. It is essential that we learn these potential pitfalls so that patients can be optimally prepared for their scans and that accurate interpretation can be made.

Positron emission tomography (PET) is the most powerful molecular imaging technique currently available for clinical use. Because deranged tumour metabolism is a common finding in many malignancies, fluorodeoxyglucose (18F-FDG) PET is frequently used for tissue characterisation, staging and therapy control. Clinical use of PET-CT can be judged according to the following grading scheme: 1a, established clinical use; 1b, clinical use probable; 2, useful in individual cases; 3, not yet assessable owing to missing or incomplete data; 4, clinical use rare (either as inferred from theoretical considerations or as demonstrated by published studies).

Clinical indications are generally (grade 1a or 1b) established for differentiating benign from malignant lesions in pulmonary nodules, pancreatic masses and residual masses after chemotherapy in malignant lymphoma. Staging is improved by FDG-PET in oesophageal cancer, breast cancer, head and neck cancer, lung cancer, malignant lymphoma and malignant melanoma. Effectiveness of radio- and/or chemotherapy can be better controlled in Hodgkin's disease and high-grade non-Hodgkin's lymphoma. Restaging has been improved in relapsing thyroid cancer, colorectal cancer, head and neck cancer, lung cancer and malignant melanoma.

In summary, the efficiency of FDG-PET has been studied in several thousand patients with malignant tumours and is found to be well documented in the international high-quality peer-reviewed literature. There are clear-cut clinical indications for FDG-PET in diagnosis, staging and therapy control, and the technique can help to improve the management of many patients with cancer.

NM 02

The Nuclear Medicine Degree Course at Bologna's Sauce: what about the Digestion?

Metello L.F., Cunha L.A.

Nuclear Medicine Degree Course - ESTSP.IPP, High Institute of Allied Health Technologies of Porto, Polytechnic Institute of Porto, Portugal

Abstract:

Due to the intrinsic dynamic nature of Nuclear Medicine as well as due to the use of equipment and techniques that are in constant evolution, there is an obvious need to provide a solid basic education which, nevertheless, should always be complemented with suitable continuous education through life.

It is more and more consensually recognized - and publically admitted - that this permanent knowledge update is a key factor, being assumed as indispensable if and when pursuing high standards of quality of the services and cares provided to the patients. It might be considered as a critical issue, namely regarding infrastructural conditions and legal actual frameworks, being also related with motivation and it indeed constitutes a daily professional challenge, but this is the only way to maintain a highly qualified Nuclear Medicine Technologist, the one and only able to take his role with responsibility and the

desirable quality in an each day more demanding and higher skilled multidisciplinary team of health experts that are based on nowadays Nuclear Medicine Departments.

The so-called “Bologna Process” provides us – all the actors in the field, academicians and health professionals involved – with a good opportunity to think about all the education process, its adaptation – or not – with the real nature of the competences needed and expected, as well as the possible best solutions to better relate the education at an higher education entity and “the real world” and its predictable evolution.

This work aims to share our process of adaptation to the “Bologna Era”.

The crucial step from this Process has been the – real and effective - assumption of the student as the “corner stone”, aiming the acquisition of practical, easily verifiable competences rather than just pure knowledge and the use of PBL – Problem Based Learning methodology.

This work will focus and characterize the “before, during and after” of the entire Process, even if we must admit that it is, by definition, an “permanently on-going Process”, as it is always under evaluation and close monitoring, since always seeking for continuously improving itself.

16:00 – 17:30 Nuclear Medicine 2

NM 03

Good preparation of radiopharmaceuticals in Italian Nuclear Medicine (RGPR-NM) Departments

Fabiola Buffoni, Maria Francesca Bardo, Elena Maria Valisi, Rosanny Leo, Roberto Lambertini, Marco Rognoni, Claudia Sdraiati, Marinella Cambiaghi, Liga Sembele, Mauro Schiavini
IRCCS O. MAGGIORE POLICLINICO, MANGIAGALLI E REGINA ELENA DI MILANO, MILAN, Italy

Introduction-Aim: At July,31st-2005 the Italian government approved the supplement of the XI Edition of the Italian Official Pharmacopeia. This includes a chapter about the rules for a good preparation of the radiopharmaceuticals in Nuclear Medicine(RGPR-NM), where the requested specific criterions for manipulation of the radiopharmaceuticals can be found. To point out the economic and procedural impact that new rules will have in NMdepartments in the observance in force on the matter of radioprotection for patient&worker(D.Lgsn.187/00/D.Lgsn.241/00) and safety of working places(L.n.626/94).

Materials-Methods:

1) analysis of: a)compliance of premises and equipment in use; b)hot-lab workflow organization and supply of the services.

2) constitution NMworking-team composed by: Director, Physician, Physicist with competence in radiation protection, Chemist, Radiographers/NMTechnologists.

3) periodic meetings.

Results-Discussion

Fulfilment of feasibility studies, estimates, financial coverage, contracts and traceableness of new premises. Presentation to the medical facility direction a project for the structural improvements needed for the updating of the premises. Although the laws-making of RGPR-NM took place in 2005, we have to consider the time required for the setting of these measures. That operations are economically onerous and difficult for the functionality of hot-lab. On the programmatic matter, the ideal period for these interventions could be the month of August which is already a month of low-demand of services. This would make possible to interrupt the activity on the expiry term of the validity of the decree and to reopen to the public with the structures adequate to the laws.

Key words: Nuclear Medicine, Radiopharmaceutical, Technologist

Objectives

- 1) To show the preparation of NM radiopharmaceuticals
- 2) To analyze of compliance of premises and equipment in use
- 3) To analyze of hot-lab workflow organization and supply of the services.
- 4) To verify the periodic meetings.

NM 04

EFFECT OF GANTRY OFFSET CALIBRATION on IMAGE FUSION in PET/CT SCANNERS

Erdal Degirmen¹, Ramazan Gündüz², Lutfu Ugur Pekguc³, Okan Falay³, Havva Palaci²
¹MEDICA Medical Center, Department of PET/CT, Istanbul, Turkey, ²MEDICA Medical Center, Department of Radiology, Istanbul, Turkey, ³Siemens /Turkey, Istanbul, Turkey, ⁴S.B. Istanbul Göztepe Education and Research Hospital/ Quality Management Department, Istanbul, Turkey

Abstract

The purpose of this paper is to evaluate the effect of gantry ofset calibration on the precise registration of PET and CT image fusion in hybrid systems.

Siemens Biograph 6 Hires LSO Scanner, 2 rod sources of 20 cm length with the activity of approximately 1 mCi Ge-68 each used for the gantry ofset calibration.

After placing the rod sources in the center FOV of the scanner with the cross source holder, original gantry ofset protocol started , a CT acquisiton acquired followed by a PET acquisition of 10 million counts. The resulting x, y and z coordinate ofset values zeroed manually and saved to the scanner database. Following this manipulated calibration, one bed PET/CT image of a 10 cm radius cylinder phantom with the activity of 1 mCi Ge-68 acquired to investigate the results.

The fusion of CT and PET images from the cylinder phantom in the 3D task card showed misaligned registration. After re-running the gantry offset calibration and saving the measured x:-1,4387 mm, y:-2,49736 mm, z:928,543 mm offset values between the two gantries , another 1 bed (16 cm length) PET/CT acqisition made with the cylinder phantom and the fusion of the PET and CT images showed a correctly aligned registration on all coordinates.

This work proved that the gantry offset calibration, after any service action causing to seperate the two gantries, is required for the correct fusion of PET and CT images.

Key words: Calibration, Correct Fusion, PET/CT

Objectives

1. Verification of attenuation
2. Right Suv (Max) verification of the lesions on the accuracy of PET examination
3. fusion of PET and CT images.
4. Automatic 3d fusion registration

NM 05

THE COMPARISON OF THE EXPOSED RADIATION DOSE LEVELS BETWEEN TLD AND DIGITAL DOSIMETERS OF THE NUCLEER MEDICINE TECHNOLOGIST IN ADMINISTRATION OF F18-FDG-PET.

Erdal Degirmen¹, Ramazan Gunduz², Okan Falay¹, Havva Palaci^{1,3}
¹MEDICA Medical Center, Department of PET/CT, Istanbul, Turkey, ²MEDICA Medical Center,

Abstract

This study includes; comparison of exposed radiation dose levels with the amount of two different type of dosimeters of the nuclear medicine technologist (NMT) who works in administration of F18-FDG-PET.

The study has realised in between January- December 2007 and the period was one year. During the study 1356 cases examined with same examination protol. In the study TLD and PM16 04A type digital dosimeters worn on the front of the upper torso by the Nuclear Medicine Technologist.

Radiation dose rates from the application of F18-FDG-PET process compared with the number of patients for one year period. TLD dose measurements: january - february = 1,26 mSv, march- april = 1,07 mSv, may-June = 1,87 mSv, july- august = C (under 0,1 mSv), september - october = C (under 0,1 mSv), november- december = 1,78 mSv and total annual dose measurement was 6,18 mSv.

PM1604A type dosimeter dose measurements; ; january - february = 1,32 mSv, march- april = 1,89 mSv, may-June = 2,04 mSv, july- august = 2,31 mSv , september - october = 2,44 mSv, november- december = 2,85 mSv and total annual dose measurement was 12,85 mSv.

After compering this results with the number of patients, there are significant difference in dose levels between TLD dosimeter and digital dosimeters results. To obtain accurate results, it is important to use digital dosimeters in additional to TLD dosimeters together to monitorise Nuclear Medicine Technologistsits dosage .

Key words: Dosimeter, F18-FDG_PET, Dose mesurement

Objectives

1. Sensitivity of TLD
2. Sensitivity of digital dosimeters
3. Monitorisation of the radiation dose levels with different type of dosimeters from the perspective of radiation protection in administration of F18-FDG-PET.
4. The most sensitive dosimetry in F18-FDG-PET examinations.

NM 06

8 years of DATSCAN use in Greece

NIKOLAOS PLATANIOTIS, IOANNA NIKOLAOU, VASILEIOS SYRGIAMIOTIS, ILIAS ABATZIS
STRAEPT, ATHENS, Greece

Purpose

Elevation of brain pathological findings (Parkinson disease and parkinsonism), with the use of DATSCAN, IOFLUPANE (¹²³I), as well as the pelting increase of its use proportion, because of its spectacular diagnostic qualities.

Material-Method

Solution through injection which contains the efficacious substance IOFLUPANE (¹²³I) is used for diagnostic purposes regarding the Parkinson disease as well as the designation of its course. At the same time it is used for the differentiation between senility and the Alzheimer disease.

After 8 years of research (2001-2008), which was accomplished in the Greek area, the particulars, which were obtained both by the nuclear medicine's departments and the corporation of the radio medicine production, validate its spectacular properties.

Results

Through the consideration of patients suffering from the Parkinson disease and inconstancy, the DATSCAN'S delicacy seems to reach the 96.5%. It is stressed that the patient's ray aggravation is negligible. The above-mentioned particulars function, world widely, as a helper to the spectacular increase of DATSCAN'S proportion use.

Conclusions

The continuous training of the nuclear doctor as well as of the medical technician radiologist by the corporation of the medicine's production, constitutes an end in itself for the improvement and exploitation of the medicine's potentials and its technical representations for the elevation of the brain pathological findings, which were mentioned above.

Saturday 17th APRIL

Education and Professional Development

08:30 – 10:10 *Education and Professional Development*

ED 01

The Concept of Competence in the development of MRI qualification: A review

Joseph Castillo, Carmel Caruana
University of Bath, UK; Institute of Health Care, Malta

Objectives:

1. To facilitate an understanding of the difference between competence and competency
2. To provide a Review of the different MRI Education/Registration process across the world
3. To open for discussion the importance of European Competency Based Education in MRI

ED 02

USE OF GOOD RADIOLOGY PRACTICE IN DAILY LIFE AND ITS SPECIFIC CASE PRESENTATION

Matjaz Vrtovec, Gregor Golja, Marko Repnik
University Medical Centre Ljubljana, Ljubljana, Slovenia

Introduction.With respect to good radiology practice in intervention radiology the patient is optimally protected against ionising radiation (IR).

Purpose. We want to illustrate usefulness of this radiology practice in daily practise in our radiology department.

Work methodology. In our radiology department, we are aware of importance of good radiology practice. For the purpose of the critical evaluation a standard patient with a common pathology has been chosed - gastrointestinal tract (GIT) bleeding. Afterwards, multiple selective angiography of different visceral branches of the aorta have been made. The inspection of the images was carried out under several conditions like digital subtraction angiography (DSA) and native technique in standard projections. Presentation of quality angiograms is the responsibility of radiology engineers, as is the protection against IR of everyone involved in the examination.

After the inspection of angiograms no leakage of contrast media has been found. Still there was a clinically visible bleeding out of the rectum. Because of it we decided to go one step ahead of standard projections and made half-axial projection. The half-axial projection showed extensive leakage of contrast media.

Findings. After a complete patient examination and the half-axial projection imaging a positive diagnosis of the bleeding has been established.

Conclusion and discussion. When there is a clinical suspicion of GIT bleeding, and there is presence of previously applied contrast media in any hollow organ of the body, half-axial projections must be done.

Key Words: intervention radiology, radiology practice, gastrointestinal tract (GIT) bleeding.

Objectives

1. to present good radiology practice,
2. we made one step ahead of standard procedure- made half-axial projection,
3. with this projection we show extensive leakage of contrast media that we could not show in standard projection,
4. this could happen because of good team work between radiologist and radiographer.

ED 03

Clinical Education and Training -Cultural Change? An Australian Perspective

Francesca Holloway^{1,2}, Patrick Eastgate¹, Kirsty Davidson¹, Seva Hatzinikolaou¹
¹Allied Health Clinical and Education and Training Unit, Queensland, Australia, ²Medical Radiation Technologists Registration Board, Queensland, Australia

Abstract

Queensland has 1200 Medical Radiation Professionals Technologists (MRPs) in the public health sector located throughout the state, from tertiary metropolitan sites to single operator remote areas. This tyranny of distance brings about unique challenges in support for health care professionals in Australia. Coupled with this is the perception of a need for cultural change in attitude amongst MRP professionals towards clinical education and training.

The author's project team undertook a training needs analysis for all MRP's in Queensland (medical imaging, nuclear medicine and radiation therapy). This included surveys, questionnaires, focus groups, research and extensive networking. Research was both quantitative and qualitative.

A report and business case was developed by the project team. A number of initiatives from the business case are under way, e.g. state wide clinical capability framework, CT competency training and clinical training skills training. It emerged that there were polarised attitudes to clinical education amongst members of the MRP workforce. Increased funding for clinical educator positions and clinical leadership are tools which will be utilised to bring about the necessary cultural change needed to support and promote clinical education and training.

Conclusion:

Structured, coordinated clinical education and training for medical radiation practitioners in Queensland is at a nascent stage. Further development is being undertaken, but there is now a growing awareness in the workplace of the need for a 'cultural change'.

Keywords:

Clinical education, Culteral change, medical radiation professionals, training needs analysis, clinical capability,

Objectives

1. To raise awareness of the clinical education and training challenges in large and diverse Australian state.
2. To share outcomes of research
3. To discuss the barriers to culteral change in the workforce
4. To discuss some strategies to overcome these barriers

ED 04

Evidence-based way of working in a Scandinavian Digital Imaging Quality education project

Eija Grönroos¹, Borgny Ween², Heidi Varonen¹, Dag Waaler², Anja Henner³, Sanna-Mari Ahonen⁵, Kent Fridell⁴, Tiina Hellebrig⁴, Juha Kurtti¹, Tuomo Saloheimo¹

¹Helsinki Metropolia University of Applied Sciences, Helsinki, Finland, ²College University of Gjøvik, Gjøvik, Norway, ³Oulu University of Applied Sciences, Oulu, Finland, ⁴Karolinska Institutet, Stockholm, Sweden, ⁵Oulu University, Oulu, Finland

Abstract

In autumn 2008 it was started a project about increasing the competence of staff working in imaging units by evidence based education in digital imaging and dose optimisation. This is done according to the principles of ICRP and DIMOND 3 in Finland, Sweden and Norway. The project management group consists of participants from College University of Gjøvik - Norway, Karolinska Institutet - Sweden, University of Oulu -Finland, Oulu University of Applied Sciences - Finland and Helsinki Metropolia University of Applied Sciences - Finland. Specific objectives are to: a) Plan and implement Scandinavian evidence-based curriculum in digital imaging and dose optimisation and the materials needed on the basis of national and international regulations about the subject in 1st, 2nd and 3rd cycle education, b) Product materials for the education and c) Evaluate the evidence-based curriculum in quality of digital imaging and the materials produced. The project group applies evidence-based principles both in the contents of the course module as well as in their own way of working. They seek consensus of experts, do literature search, take into account national and international guidelines about QA and radiographers competency and survey the radiography departments staff about what would be the most important contents of the course module. Keywords: e-learning, evidence-based radiography, digital imaging, quality assurance

Objectives

Inform about:

1. new Scandinavian co-operation project in the field of radiography,
2. main contents of the planned new education in quality assurance in digital imaging,
3. evidence-based way of working during making the new curriculum and inside of it,
4. new ways of e-learning in the field of radiography.

Breast Imaging Program

14:00 – 15:40 Breast Imaging 1

BR 01

TBA

BR 02

EARLY DETECTION OF BREAST CANCER: LIMITS, ADVANCES AND RT'S ROLE IN MAMMOGRAPHY AND BREAST US

Stefano Pacifici

Gruppo Mediterraneo di Breast Imaging, Rome, Italy

Abstract

Breast cancer is a very common affection. 12-13 % of women develops breast cancer before coming at the age of 80, and earlier is detected, more are the chances of a successful treatment. It's important to understand the difficulties inherent the study of the breast and the **early detection** of its pathology. The role of today's European radiological technologists through **mammography** and **breast US** limits and advances between past and next future.

Objectives

1. To learn the importance of a good mammography or breast ultrasonography in finding breast cancer in early stage.
2. To learn the difficulties to detect pathology of mammary gland
3. To learn the limits of Mx and US
4. To know the advances in Mx and US
5. To aware of the current level of training of radiographers in Europe

16:00 – 17:30 *Breast Imaging 2*

BR 03

TBA

BR 04

The role of radiographer in the preliminary management of the MR mammography (MMR) sequences

Elzbieta Koprowska, Barbara Sznitko, Tadeusz J Popiela, Andrzej Urbanik
Department of Radiology Jagiellonian University Hospital, Cracow, Poland

Purpose

The study is analyzing the possibility to shorten the time of preliminary MMR computer analysis with the participation of radiographer.

Material and method

The results of MMRs obtained from 40 women were submitted for computer analysis. Trained radiographer analyzed the MMR sequences, where the pathological lesions were colour coded. The radiographer focused on the red-coded pathologies (quickly enhanced signal intensity to over 111% during 1 minute and quick wash-out) and on green-coded pathological lesions (signal intensity enhanced to about 100% in the first minutes and slightly slower wash-out rate). The radiographer calculated contrast enhancement curves for each pathology. The images with each single lesion and its corresponding enhancement curve were saved separately. The radiologists compared raw data with those obtained from the radiographer and evaluated pathologies in the same colour coded sequences.

The results obtained from 38 controls were analyzed only by radiologists.

Mean times of analyses made only by radiologists and together by radiologist and radiographer for both groups of patients were compared.

Results

The time of MMR sequences analysis made by radiographer and radiologist in women without suspected pathologies did not show statistically significant differences compared with control group. In 15 women with 1-2 suspected lesions the time was shorter by 4 min. 35 sec. and reduced by 15 min. in 15 cases with 3 or more color-coded lesions.

Conclusions

The participation of radiographers in the computer analysis of suspected focal lesions significantly reduces time of MMR analysis by the radiologist.

Mammography MR, breast pathologies, CAD

Objectives

1. Shortening time of mammography MR analyses
2. Additional role of radiographer
3. Usefulness of raw data images versus post-processing images
4. Usefulness of colour-coded lesions in examination analysis

BR 05

EKLUND'S TECHNIQUE IN MAMMOGRAPHY: AN OPTIONAL OR MANDATORY USE?

STEFANO PACIFICI

GRUPPO MEDITERRANEO DI BREAST IMAGING, ROME, Italy

Abstract

The methodical use of the **Eklund's Technique**, basic and unwaiveable in the **breast implants study**, is highly suggested to achieve more breast tissue, to avoid dark zones, and to check correctly the inside and the edges of the implants some reflections about the relative **medical/legal aspects**

Objectives

Sensitizing the radiographers to the methodical use of this technique; learning the correct technique; acquaintance of the correct target of this technique and its related medical/legal aspects

=====G eneral Radiography Program

08:30 – 10:10 *Diagnostic Imaging - Angiography*

DI 01

The radiographer in a cardiac catheter lab.

Filippo Bristot¹, Pierpaolo Pipan², Laura Blotto¹, Antonella Comoglio¹, Cinzia Ravetto¹, Renato Gorla¹, Morris Magnaghi², Pier Luigi Soldà¹, Alessandra Truffa¹

¹: *Degli Infermi Hospital, Cardiology Department, Biella, Italy;* ²: *Degli Infermi Hospital, Radiology*

Abstract

Consider the work in a cardiac catheterization laboratory, and particularly the role of radiographer, in 3 different points of view:

- Radiological technique: What do / what should radiographers do in a cath lab?
- Microbiological risk: How much is it important?
- Communication: The significance of the dialogue in the teamwork and the possibility of health professionals interchangeability. Is it imaginable to mix the competences of nurses and radiographers?

DI 02

Quantitative assessment of the vascular integrity of the humeral head with selective DSA and correlation with the risk of avascular necrosis following surgery.

Ilias Abatzis, Ioannis Kaffes, Nikolaos Kapernarakos, Ioanna Nikolaou, Vasileios Syrgiamiotis, Nikolaos Plataniotis
Society Of Radiological Technologists Of Hellas , Graduates Of The Technologic Educational Institutions, ATHENS, Greece

Purpose: The assessment of the vascular integrity of the humeral head in displaced 4-part valgus impacted fractures of the proximal humerus treated with osteosuture.

Methods: 12 patients with 4-part valgus impacted fractures of the proximal humerus were studied. The average impaction angle was 42.4° while the lateral displacement of the humeral head ranged between 1-7 mm. Preoperative selective DSA of the brachial artery was performed 6 to 12 hours after admission using three standard views. Fracture fixation was achieved with osteosuture. Angiography was performed again 8 to 10 weeks following surgery.

Results: Digital image processing, using the segmentation technique, showed no statistical difference in the humeral head blood supply pre- and post-operatively. The average length of vessels and the overall area of blood supply (vessels/mm²) were almost the same ($p < 0.01$) in 11 patients. During follow-up no signs of avascular necrosis were observed 18-20 months postoperatively. One patient presented with partial avascular necrosis.

Conclusions: Selective DSA of the brachial artery is an effective method for the evaluation of the vascular integrity of the proximal humerus and correlates well with the risk of avascular necrosis following major surgery.

Objectives: Assessment of the vascular integrity of the humeral head

DI 03

Distal flow protection devices during percutaneous treatment of acute and subacute lesions of lower extremity arteries

Ioanna Nikolaou, Ilias Abatzis, Efthimia Vamvakoula, Fotis Kollas, Vasileios Syrgiamiotis, Nikolaos Plataniotis
Society Of Radiological Technologists Of Hellas , Graduates Of The Technologic Educational Institutions, Athens, Greece

Purpose: Outflow protection devices are well established in the PTA of carotid lesions. Yet there is no sufficient experience regarding their role in the performance of other peripheral interventions. We present

our experience using these devices during percutaneous interventions of acute and subacute occlusions of the lower extremity arteries.

Methods: In 21 consecutive patients with acute and subacute arterial occlusion (estimated age of thrombus: 1 day up to 3 months) distal protection devices were applied during percutaneous interventional treatment. The treated lesions were located accordingly in: external iliac, n:1, femoral n:6, popliteal n:9, infrapopliteal arteries n:5) Catheter occlusion device was used in 9 cases and guide wire filter device in 12 pts.

Results: The device was successfully applied in all cases. In 14 cases particles >1mm were extracted. In 2 cases device dislocation, and vasospasm occurred one for either type of device used. In both cases vasospasm was treated with local spasmolytic therapy. In all cases the interventional procedure was successfully completed without angiographic and clinical signs of distal embolization. All patients showed clinical improvement at the 24th hour and 30th day follow up.

Conclusion: Distal flow protection devices seem to be feasible and safe when applied during percutaneous interventions of lower extremity arteries preventing distal embolization.

Objectives: Outflow protection devices

14:00 – 15:40 *Diagnostic Imaging – Computed Tomography*

DI 04

Pitfalls in coronary CT angiography with 64 VCT Light Speed - GE- our initial experience

Danijela Pejkovik, Mihajlo Manoilov, Darko Stojanoski, Zan Mitrev
Special Hospital For Surgery, Filip II, Skopje, Macedonia, the Former Yugoslav Republic of

Purpose: To share our initial experience and pitfalls during performance of the coronary CT angiography (coronary CTA) with 64 VCT Light Speed as well as our suggestions for all beginners how to avoid them.

Materials and methods: From February to July 2008, 254 patients underwent coronary CTA with 64 Light Speed VCT - GE. The examinations were performed by two radiological technologists independently and analyzed by two radiologists. Cardiac SSegment 30-75 BPM ECG gated, β -blocker protocol was used (Scan type - Cardiac; Cardiac Mode - Snap Shot Segment; Rotation time - 0,35s; Detector Coverage - 40,0mm; Helical Thickness - 0,625mm; SFOV - Cardiac Large; Interval - 0,625mm; kV 120; 600-800 mA (ECG modulated mA), Smart preparation, volume of contrast: 80 -100ml with dual shot injector.

Results: Out of 254 performed examinations 48 (18,8%) were with some motion artefacts and high noise. In 10 (3,9%) coronary CTA the problem was the obesity of the patients, 11 (4,3%) CTA were with breathing artefacts, 9 (3,5%) coronary CTA were with non-optimal enhancement (early or late scanning), in 7 (2,7%) coronary CTA the problem was communication with the patients and in 11 (4,3%) coronary CTA the problem was the heart rate over 80 BPM.

Conclusion: For a correct accomplishment of coronary CTA, the main goal is a good cooperation with the patients in their preparation for breathing as well as a good educated technologist for correct following of the parameters (ECG triggering, optimal enhancement, scan delay time).

Objectives: To review our experience of Cardiac Computed Tomography (CT) and to provide a basic outline of the techniques and protocols involved in coronary CTA with GE 64 VCT Light Speed.

DI 05

Low-kilovoltage Pulmonary CT Angiography in Pulmonary Thromboembolism

Fuldem Mutlu Aygun¹, Nezaket Ozgur¹, Murat Serhat Aygun^{2,1}, Cetin Atasoy¹

¹Ankara University Radiology Department, Ankara, Turkey, ²Military Hospital, Kutahya, Turkey

Purpose: To compare the image quality and radiation dose of low-kilovoltage and standard kilovoltage pulmonary computed tomography angiography.

Materials and Methods: 137 patients underwent pulmonary CTA with these kilovoltage levels: 35 patients with 80 kVp, 65 patients with 100 kVp, 37 patients with 120 kVp. Milliampere-seconds, pitch, collimation, the volume and injection rate of contrast medium were held constant in all groups. The pulmonary artery mean density and standard deviation were measured at the level of the main pulmonary artery via a standard circular region of interest. Pulmonary artery visibility score and ratio were calculated. The three groups were compared regarding the radiation dose and image quality parameters including pulmonary artery enhancement, image noise (standard deviation of the density), pulmonary artery visibility score and ratio.

Results: Mean radiation doses were 100, 205, and 346 mGy-cm in the 80 kVp, 100 kVp and 120 kVp group respectively. In 80 kVp group, the reduction of the radiation dose was 51% and 71% when compared with the 100 kVp and 120 kVp group, respectively. Compared with 120 kVp, dose reduction was 41% in 100 kVp. Pulmonary artery enhancement was higher in low kilovoltage. The mean pulmonary artery density was 622 HU, 455 HU, and 338 HU in 80, 100, and 120 kVp groups, respectively. Pulmonary artery visibility ratio was higher in low-dose. The noise increased exponentially with chest area, and this relationship was more prominent with low kilovoltage. Pulmonary artery visibility points of the three groups were not significantly different.

Keywords: Pulmonary CT Angiography, Radiation dose, low-kilovoltage, noise.

DI 06

Virtual endoscopy as a diagnostic or follow up tool in renal artery stenosis

Ilias Abatzis, Maria Dousi, Vasileios Syrgiamiotis, Aggeliki Diamantopoulou, Theodoros Panou, Ioanna Nikolaou, Nikolaos Plataniotis

Society Of Radiological Technologists Of Hellas ,Graduates Of The Technologic Educational Institutions, Athens, Greece

Purpose: In the present study we propose the use of virtual endoscopy (VE) in patients with renal artery stenosis as a diagnostic and/or follow up tool study especially in the need to define vascular patency.

Materials and Methods: We performed the suggested technique in twenty four patients with ostial atherosclerotic renal artery stenosis and correlated the results with conventional angiography. The stenotic segment was successfully depicted with the aid of VE. The latter patients were finally treated successfully by placement of metal stents and VE was applied as a follow up study for patency control. The patients were followed for a mean period of 12 months.

Results: In all patients the stenotic segment was observed and VE findings were concurrent with angiography examination. In addition, after metal stent insertion the 12 month- patency rate was 83.3 %. Angiography and VE findings were also concurrent during the follow up period. Moreover, VE proceeds beyond the stenotic part, allowing visualization of the arterial lumen both cephalad and caudal to the obstruction point.

Conclusion: VE provided a more dynamic, direct approach in the evaluation of the arterial lumen as well as in the evaluation of a vascular stricture both cephalad and caudal to the obstruction point. It represents a non-invasive technique providing amplification of the image perception in the three

dimensional space. In this respect, VE is taking advantage of information obtained in axial CT slices, and further provides three dimensional relationships of pathological regions.

Keywords: Virtual endoscopy

DI 07

Compare MSCT cholangiography in evaluating patients with obstruction of the biliary tract as diagnostic method with ERCP endoscopic retrograde cholangiopancreatography as diagnostic method Ilija Krantic- radiographer, Zoran Đorđević radiologist, Department of Radiology, MMA Belgrade, Serbia

Ilija Krantic¹, Zoran Djordjevic¹
¹MMA, Belgrade, Serbia, ²MMA, Belgrade, Serbia

Abstract

We compared (MSCT) cholangiography in the assessment of patients with bile duct obstruction as diagnostic method with ERCP endoscopic retrograde cholangiopancreatography as diagnostic method.

Methods: Thirty- three patients with clinical or biochemical signs of biliary obstruction were prospectively studied. MSCT cholangiography was performed without biliary contrast agent, with intravenous injection of 150 mL of iodinated contrast material at 4 mL/s, 2.5-mm slice thickness, 7.5-mm/s table speed, and 1.25-mm reconstruction interval. Axial, multiplanar, and minimum intensity projection reformatted images were evaluated. All MSCT cholangiography was performed on device Toshiba(Aquilion) Results With regard to presence and site of obstruction, agreement was observed across MSCT cholangiography, and reference investigations in all cases. Concerning cause, the correct diagnosis was made by MSCT cholangiography in 29 of 30 patients. Three cases of common bile duct lithiasis, diagnosed on ERCP, were missed by MSCT cholangiography.

Conclusion: MSCT cholangiography can be considered a possible noninvasive alternative to ERCP as diagnostic method.

Keywords: Bile ducts, MSCT cholangiography, stenosis or obstruction - Bile ducts, ERCP- endoscopic retrograde cholangiopancreatography , Computed tomography, comparative studies.

Keywords: Bile ducts, MSCT cholangiography, stenosis or obstruction - Bile ducts, ERCP- endoscopic retrograde cholangiopancreatography

DI 08

Iatrogenic Hepatic Artery Injuries: MDCT Imaging and Percutaneous Trans-Arterial Treatment

Nikolaos Plataniotis, Ioanna Nikolaou, Ilias Abatzis, Giorgos Zervas, Maria Dousi, Vasileios Syrgiamiotis
Society Of Radiological Technologists Of Hellas ,Graduates Of The Technologic Educational Institutions, Athens, Greece

Purpose: Iatrogenic hemobilia is gastro-intestinal bleeding occurring in less than 2% of liver injuries with a subsequent mortality rate of 2,3%. Digital subtraction angiography followed by trans-arterial embolization is the gold standard therapeutic modality.

Methods: We retrospectively searched our department's medical records for patients presented with a history of upper gastrointestinal bleeding as a result of previous intervention in the liver area. Pre-treatment imaging acquisition was performed using a multi-slice ct scanner, using a three phase acquisition protocol: un-enhanced acquisition, an arterial and finally a portal venous phase of contrast enhancement scans.

Results: In total, 5 patients met the abovementioned criteria. All subjects had a previously history of a therapeutic intervention in the liver. Three lesions were secondary transhepatic biliary draining , one after ERCP and finally one after laparoscopic cholecystectomy. All patients suffered from jaundice, right upper quadrant abdominal pain and anemia due to melena or hemodynamically stable hematemesis. The time interval from the initial intervention to the time patients were presented in our department for further evaluation and/or treatment ranged between 5 days to 2 years. MDCTA managed to recognize the pseudo aneurysm of a segmental hepatic artery and of the gastroduodenal artery as the cause of the gastrointestinal hemorrhage. Common hepatic artery angiography confirmed the MDCTA findings in all cases.

Conclusions: Hepatic artery pseudo aneurysm resulting in hemobilia and upper gastro-intestinal hemorrhage is a rare but life threatening complication that can be effectively diagnosed with the use of a MDCT.

Keywords: Digital subtraction angiography (DSA)

16:00 – 17:30 *Diagnostic Imaging – General Radiography*

DI 09

Effect of heat on image plate in a Computed Radiography System

Khaled AlKhalifah, Ajit Brindhaban, Abrar Dashti, Latifa ALKandari, Abeer ALKandari
Kuwait University, Kuwait, Kuwait

Introduction: Image plate can be affected by various artifacts as an example, Scatter radiation, quantum mottle, light, and heat. According to the previous work, exposing image plate to a visible light or delay processing will cause unwanted noise which leads to distract image and compromise accurate diagnosis. Due to that, the radiographer is recommended to avoid delay processing of IPs to prevent noise in the image and therefore, degrading the image quality. Heat affects the image quality by increasing the noise in the final image. The aim is to measure the amount of noise created by exposing image plates to heat.

Method: Image plates from two different medical companies (Agfa and Fuji) with two different sizes 8×10 (s), 10×12 (m), stored at different room temperatures (35°C, 40°C, and 45°C) and left for 5 hours. Scanning the image plates, and processed, the region of interests is measured in the produced final image by using PACS, mean, standard deviation and noise percentage (N%) were calculated.

Results: In Fuji IPs N% increased from 0.004% to 4.49% for 8×10, while 10×12 it increased from 0.1% to 5.56% when the temperature reached 45 °C. Agfa system, the N% remained virtually unchanged at all temperatures for both IP sizes with significantly high noise >5%.

Discussion and Conclusions: Agfa shows sensitivity to heat from 35° C, while Fuji shows heat sensitivity to 45° C, and no significant change between image plate sizes.

Keywords: Image Plate, Computed Radiography, Heat

Objectives:

1. Study The effect of heat on image plates
2. Compare various Image plates produced by different medical companies
3. Study the image quality
4. Effect of heat on image plate size

DI 10

SINDESMOLYSIS Acromioclavicular (ATTACHMENT WITH 'HOOK PLATE') CLINICAL CASE

BOSTJAN GAJSEK, ANZE KRISTAN

UNIVERSITY MEDICAL CENTER LJUBLJANA, LJUBLJANA, Slovenia

Introduction: Sindesmolysis Acromioclavicular (called AC) is a dislocated acromioclavicular joint. Often the two ligament (Acromioclavicular and coracoclavicularis) are torn. (1) The injury is common among extreme athletes likely to fall on the shoulders. (2)

Methods: anamnesis the bike down, the patient falls into flying handlebar.

DIAGNOSIS Dislocation of the AC joint up. The radio imaging shows a deviation of the crack articulation.

THERAPIE1 Patient gets support for immobilization of clavicle is removed within 14 days. The default remains unchanged. He waits 18 months for the operation.

THERAPIE2 patient information with the trauma surgeon. There is the condition of the AC joint. Mobility limited upper body. The deal with Hook Plate fixation takes place. Not possible to restore the ligaments due to the age of the injury.

REHABILITATION Stagnation arm for 14 days and physiotherapy.

PROGNOS The osteosynthesis material remains standing because of the activities of the patient.

RESULTS: STATE OF PATIENT (2 years later) Flexibility without pain at the expense excessive. The position of the AC joint is anatomically and without complications.

Conclusions: In our case, the treatment of syndesmolysis AC using the HOOK PLATE process is 100% reliable, which allows the normal flexibility of the shoulders (operation without pain). A successful over 90% of treatment with this method is known around the world. (3)

Keywords: Acromioclavicular joint, sindesmolysis, osteosynthesis

Objectives: The success of the surgery and good prognosis of the individual according to his LIFE STILE depend largely an accurate history of the patient and the quality of team collaboration between the trauma surgeon and radiologist

DI 11

MDs' ATTITUDE TOWARDS RADIATION SAFETY TRAINING

Havva Palacı, İhsan Kuru, Semrin Timlioglu

Goztepe Education and Research Hospital, Istanbul, Turkey

Purpose: The purpose of this study is to define medical doctors' attitude towards Protection Against Radiation in Diagnostic Radiology basic training. **Significance:** According to the ALARA (as low as reasonably achievable) philosophy, minimizing the radiation exposure of patients and employees is essential. The study covers the medical doctors at Göztepe Eğitim ve Araştırma Hastanesi (Göztepe Education and Research Hospital).

Method: The study covered 100 medical doctors working for the hospital between January - November 2009. A 5-point Likert-type Scale was applied to the medical doctors that attended the training session.

Findings: According to the survey, Radiation Safety Training was regarded successful by 82% of the medical doctors. The question about the training's capability of meeting the requirements was answered fully by 40%, sufficient by 45%, and poor by 7% of the medical doctors. The time length allocated for the training was found insufficient by 10%, whereas found sufficient by 40% and quite sufficient by 50% of the medical doctors. Training materials were qualified very good and good by 81% of the medical doctors.

Conclusion: It was observed that, protection against radiation in diagnostic radiology basic training is generally successful and provides the information the medical doctors need. Doctors advised that practical aspects for orthopaedics and urologists are needed in radiation safety trainings.

Key Words: Radiation Safety, Radiation Safety Trainning, Evaluation of Training

Significance: According to the ALARA (as low as reasonably achievable) philosophy, minimizing the radiation exposure of patients and employees is essential. Specialist from different clinical areas like from clinical urology, brain surgery, orthopaedics use radiation sources like fluoroscopy is essential an education programme about Radiation Safety this study shows importance of Radiation safety education programmes for Medical Doctors. In this study includes evaluation of radiation Safety education by the doctors and purposing a guidance for new studies.

DI 12

SONOGRAPHIC DETECTION OF PHYSIOLOGIC PLEURAL FLUID IN HEALTHY CHILDREN

Ksenija Šlibar¹

¹*Clinical radiology institute, Ljubljana, Slovenia,*

Abstract

Chest ultrasonography of both pleural spaces was performed in a group of fifty (50) healthy volunteers (20 boys and 31 girls; from 4 to 15 years old) to identify pleural fluid, first in the lateral decubitus position and then leaning on one elbow. An anechoic fluid layer at least 2 mm thick was taken as a positive results. The follow-up study was repeated on each subject after two (2) months.

Keywords: pleura, ultrasound, fluid

Objectives

Until now it was considered that the display of any sign of fluid diseases. The development of ultrasound technology has made it possible to see the space between the two pleural-pleural spaces. From the research that the amount of physiological pleural fluid and ultrasonic appearance of pleural space may be very different. With investigation confirms the thesis that there are healthy individuals who are always a few more pleural fluid, this should also be outlined ultrasound boundaries between the physiological fluid and pleural small estuary as a sign of disease.

DI 13

8 years of calibration experience in radiation protection field in Greece

Ioanna Nikolaou, Vasileios Syrgiamiotis, Ilias Abatzis, Nikolaos Plataniotis

Society Of Radiological Technologists Of Hellas ,Graduates Of The Technologic Educational Institutions, Athens, Greece

Abstract

The Ionizing Radiation Calibration Laboratory (HIRCL) of Greek Atomic Energy Commission (GAEC) is the National Metrology Institute in the field of Ionizing Radiation. In order to evaluate calibration services as well as the quality of the equipment used in Greece and the overall response of users in calibration procedures, an electronic data base was designed as a component of the National Radiation Protection Data Base of GAEC.

About 1000 survey meters have been calibrated the last 8years and they are mainly used in nuclear medicine departments and industrial facilities. 160 survey meters are calibrated per year, while in 25%

their response is adjusted in calibration points that the manufacturer indicates. The mean calibration time for each instrument is about 12 working days. Only 27% of users have sent their instruments for re-calibration, and only 5% calibrate their instruments during the 2 years interval as indicated in Greek Legislation. Additionally only 2,5% have requested the evaluation of the energy dependence of their instruments. Although the calibration quantity is $H^*(10)$ (Sv/h), 80% of instruments measure different physical quantities and problems about the expression of calibration factor in the certificates are discussed. Statistical analysis of calibration factors and comparison between different types of survey meters are also presented.

The analysis performed indicated two important issues: Although the majority of the instruments used are calibrated, re-calibration is not really implemented. Generally the radiation protection equipment used fulfils the technical requirements. However there is still room for improvement.

Keywords: Ionizing Radiation Calibration Laboratory

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Contrast Media

11:00 – 12:30 *Symposium organised by Covidien*

CM 01

COMPARISON OF THE TIME TO PREPARE CONTRAST MEDIA INJECTION IN CT SCAN EXAM WITH PREFILLED SYRINGES AND BOTTLES IN 7 EUROPEAN COUNTRIES

Antoine lafuma
Covidien, Zurich, Switzerland

Introduction:

The use of contrast media during CT scan examinations has dramatically increased during the past years. Several articles studied the possibility to increase the productivity of contrast media. The safety benefits of ready to use injectable medicines is now widely recognised and contrast media for CT-scans can also provide a benefit in terms of productivity for the users.

Method:

We performed a time and motion study comparing Optiray™ Ioversol (in a pre-filled syringe) and syringes filled from bottles during CT scan examinations in 15 centres from 7 European countries. This study focused on the tasks of preparing the injection and injector and discarding the supplies. Measurements of engineered time standards were computed through EASE software using the Methods Time Measurement-1 and MTM-2 standard of work measurements.

Results:

89 analyzed observations of 173 were performed with Optiray. The average time to perform the injection was calculated at 162 s for pre-filled syringes vs. 214 for bottles in exams using a dual head injector and at 64 s for pre-filled syringes vs. 116 s for Vials in exams using a single head injector. The time benefit was calculated as 52 seconds decreasing the time spent for injection preparation by 35%. There was a low variability in our findings with a range from 45 to 135 s of benefit for with-saline exams and from 48 to 57 seconds for without-saline exams. Based on these calculations the time efficiency benefit could lead to an increase of 102 exams performed per year in a department performing 2 CT scans per hour, up to 407 additional exams per year for a room with 4 CT scans per hour.

Conclusions:

The improvement provided by pre-filled syringes, could lead to an increase in productivity that could equate to a decrease in waiting lists.

Objectives

1. Showing the CT department and users (Radiographers) than using Contrast Media in pre-filled format instead of vials can be :
2. Less stressful for radiographers because it's easy

3. Increase patient throughput because it's quicker
4. Enhance CT workflow efficiency

CM 02

Contrast media in radiology: handling and bacterial contamination

Maria Martin, Frauke Mattner
covidien, zurich, Switzerland

Background:

Intravenous application of contrast media in radiology is an every day action. Some systems may use contrast media as false multiple-dose vials because different radiological procedures require different amounts of contrast media. To use these vials as multiple-doses increases the risk of microbial contamination. We investigated how contrast media were used and if bacterial contaminations occurred.

Methods

Over a one-week period an infection control nurse observed and documented the handling with contrast media in the CT, NMR and angiology area of a tertiary-care hospital. All vials and lines used over the day were collected and sterility testing was performed.

Results

During the study period 44 (32 or 23) patients (pts) had an CT-scan (NMR or angiologic examination). In the same time 15 (12 or 6) contrast media vials were used, resulting in 3,4 (2,7 or 4,5) pts per vial. Out of 33 used contrast media vials 2 (6% CI95% (0,7-20%)) were contaminated by 1 CFU micrococci spp. each. Out of 31 NaCl 0.9% and scandicain 1% vials 2 (6.4% CI95% (0.8-21%)) were contaminated by 1 to 4 CFU micrococci spp. or Bacillus spp. Out of 66 patient lines 5 (7.5% CI95% (0.7-17%)) were contaminated with 1 to 4 CFU micrococci spp., Bacillus spp. or coagulase-negative staphylococci.

The surveillance revealed a low compliance to hand disinfection before aseptic procedures (preparation of injector systems, connection and disconnection of patients). One injector system required a contrast media loading using an open system.

Objectives

1. Optimise hygiene in radiology department
2. Reduce risk of microbial contamination and infection risk
3. Necessity to revisited procedures for the intravenous applications in radiology and propose systems guaranteeing aseptic

Posters

P 01

"DOUBLE TRACK THERAPY" Pulmonary Precision TACE + Percutaneous RFA for Lung Neoplasms

Giuseppe Laricchia, Pasquale Molinari, Teresa Lionetti, Vincenzo Colaluca, Stefania Crescenza Sassanelli, Vittorio Mattioli, Vito Fazio, Anna Maria Catino, Girolamo Ranieri, Gennaro Gadaleta-Caldarola, Gianluca Vinciarelli, Fabio Fucilli, Franco Armenise, Cosmo Damiano Gadaleta
National Cancer Institute G. Paolo II, Bari-Italy, Italy

Abstract

Radiofrequency thermal ablation (RFA) of lung tumors has demonstrated to be safe and feasible, with very promising results as local ablative treatment in unresectable patients or in case of refused surgery. Nevertheless, a limitation of this technique is represented by the risk of local recurrence, not-negligible in tumors larger than 3 cm.

Experimental studies have investigated the feasibility and pharmacodynamics of some antiproliferative agents, administered as regional therapy by lung perfusion, so demonstrating the high level of cytostatic loco-regional activity without relevant systemic toxicity.

*Hence, combined techniques, in order to potentiate lung RFA, have been studied, reporting attractive results. Based on these previous data, this study has been planned to investigate the feasibility and safety of a combined procedure with percutaneous lung RFA preceded by **pulmonary chemoembolization (Precision-TACE)**.*

*This pilot study aimed to evaluate the feasibility and the safety of percutaneous lung RFA plus pulmonary arterial embolization (**Pulmonary Precision-TACE**) in patients with inoperable **lung metastases**.*

Objectives

Lung RFA has demonstrated to be safe and feasible. Experimental studies reported the pharmacodynamics of some antiproliferative drugs, administered by Isolated Lung Perfusion (ILP), demonstrating high level of cytostatic loco-regional activity without relevant systemic toxicity. Recently, locoregional "combined techniques", are under investigation.

Aim of the study

To investigate the feasibility and safety of a "combined procedure" with percutaneous lung RFA, preceded by segmental (Precision) Pulmonary Arterial ChemoEmbolization (Precision Pulmonary TACE).

Patients characteristic

Pts enrolled 14, age 57 (median, range 32-80)

Technique

1. **1st step** Precision Pulmonary TACE (PPTACE)
2. **2nd step** Percutaneous lung CT-guidance RFA, 48-72 hours after PPTACE.

Conclusions: PP-TACE plus RFA, "Double Track Therapy", is safe and feasible.

P 02

TACE plus RFA as "Single-Step" Treatment of Liver Malignancies

Giuseppe Laricchia, Pasquale Molinari, Annamaria Catino, Girolamo Ranieri, Vito Fazio, Fabio Fucilli, Vittorio Mattioli, Teresa Lionetti, Stefania Sassanelli, Vincenzo Colaluca, Cosmo Damiano Gadaleta
National Cancer Institute G. Paolo II, Bari-Italy, Italy

Abstract

The combination of **TACE** and **RFA** could improve technical results in the treatment of liver tumors. The volume of necrosis can be increased both by the ischemic effect of the embolization, and by the hypothesized synergism between antiproliferative drugs and RFA. Furthermore, lesions not visible by **CT** and **CEUS** could be treated concurrently.

To evaluate the safety and the feasibility of TACE combined to percutaneous RFA during simultaneous session ("single-step") as locoregional treatment of HCC or liver metastases.

The procedure consisted, under general anesthesia and during the same session, on **TACE** (with Epirubicin plus Mitomycin C, Doxorubicin or Irinotecan, according to the type of neoplasm) administered immediately before and after percutaneous RFA. The baseline staging included total body CTscan and liver CE-US. A CTscan of abdomen was obtained 48 hours after the procedure, to detect and manage complications.

One month after the procedure, a CTscan plus a CE-US of superior abdomen were obtained to assess the response.

The combination of TACE plus RFA during the same session is safe and feasible. Side effects are moderate and easily manageable. Further investigation is needed to draw definitive conclusions about the efficacy of the technique on local control of disease and survival of these patients.

Background

The combination of TACE and RFA could improve technical results in the treatment of liver tumors.

Aim of study

To evaluate the safety and the feasibility of TACE combined to percutaneous RFA during simultaneous session ("single-step") as locoregional treatment of HCC or liver metastases.

Technique

The procedure consisted, and during the same session, on TACE immediately before and after percutaneous RFA.

Conclusions

*The combination of **TACE** plus **RFA** during the same session is safe and feasible. Side effects are moderate and easily manageable.*

P 03

Infrapopliteal Sirolimus-Eluting Versus Bare Metal Stents for Critical Limb Ischemia: Long-Term Angiographic and Clinical Outcome in More Than 100 Patients

Ilias Abatzis, Nikolaos Plataniotis, Ioannis Kaffes, Aleksandra Sanida, Maria Konstantinidou, Vasileios Syrgiamiotis

Introduction:

Amassed published data highlight the advantages of below-the-knee angioplasty, especially in terms of decreased peri-procedural morbidity and mortality rates and promising rates of long-term limb salvage. Nonetheless, percutaneous interventions are still related to increased vascular restenosis and repeat procedures, mainly as a combined result of neointimal hyperplasia, negative vessel remodelling and progression of atherosclerotic disease leading to relapse of CLI on account of the diminished distal blood flow. Drug-eluting stents (DES) have emerged as a potential solution to the above limitations of endovascular treatment of peripheral below-the-knee arterial occlusive disease, especially in CLI patients.

Material And Methods: This was a single-center double-arm prospective registry including patients suffering from CLI that underwent infrapopliteal revascularization with angioplasty and bail-out use of either SES or BMS.

Results: In total, 103 patients were included in the analysis. 41 patients (75.6% diabetics) were treated with BMS (47 limbs with 77 lesions) whereas 62 patients (87.1% diabetics) with SES (75 limbs with 153 lesions). 3-year cumulative proportion outcomes according to Kaplan-Meier plots showed no statistically significant differences between the two groups with regard to mortality rates (29.3% vs 32.0%, $p=0.205$ by log-rank test) and limb salvage (80.3% vs 82.0%, $p=0.507$ by log-rank test).

Discussion: CLI is characterized by diffuse multilevel infrainguinal and infrapopliteal disease and angioplasty, in the delicate below-the-knee arterial network frequently has a suboptimal immediate result owing to dissection or elastic recoil.

Objectives: The advantages of below-the-knee angioplasty

P 04

IN VIVO STUDY OF THE EFFECTS OF INTRAVENOUS CONTRAST MEDIA ON RED BLOOD CELL FILTERABILITY

Ilias Abatzis, Spiros Droulias, Kon/nos Georgiadis, Nikolaos Plataniotis, Maria Konstantinidou, Ioanna Nikolaou
Society Of Radiological Technologists Of Hellas ,Graduates Of The Technologic Educational Institutions, Athens, Greece

Purpose Erythrocyte filterability is important during interventional procedures in order to preserve microvascular bed. The aim of this work was the in vivo study of the deformability of the erythrocyte membrane in patients who received contrast media and compare their outcome.

Materials And Methods Twenty two patients were enrolled in the study. Blood samples were collected before and 5, 30, and 60 minutes after the injection of the contrast medium. Iodixanol, Iopentol and Iopromid were compared. Red blood cell deformability was studied by the initial filtration flow rate method. The filtration measurements were performed using the Hemorheometer and subsequently the Index of Rigidity (IR) was estimated

Results IR was increased immediately after the injection of contrast media and was found to be close to the normal range one hour later. Iopentol had influenced the IR more than the other contrast media. On the contrary, Iodixanol had no significant effects on the filterability of the red blood cells

Conclusions The present study showed that the radiographic contrast media exert a significant influence on the deformability of the erythrocyte via rheological effects on its membrane.

Objectives Erythrocyte filterability

P 05

MRI ARTIFACTS COMING FROM METAL OBJECTS DISTORTING THE B₀ FIELD

Vasileios Syrgiamiotis, Kon/nos Georgiadis, Aggeliki Diamantopoulou, Efthimia Vamvakoula, Ioanna Nikolaou, Nikolaos Plataniotis
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Abstract

We are going to present some cases regarding some technical disorders and metal objects distorting the B₀ field in a magnetic resonance (MR) examination. The above without dispute causes image artifacts.

An image artifact is any feature which appears in an image which is not present in the original imaged object. Artifacts are typically classified as to their source.

Some of the artifacts of technical disorders are Radio Frequency (RF) inhomogeneity (failure of RF coil), data corruption from archive media, body coil signal loss, RF interference (unshielded electric components in the magnet room), zipper artifacts (that can be controlled easily are those due to RF entering the scanning room when the door is open during acquisition of images).

As far as it concerns the metal objects which distort the B₀ field, it is mentioned the dental work artifacts (associated artifact distant from the source), braces (exhibit horseshoe shaped artifacts), patient wearing belt (metal-studded belt), metal effects on fat saturation (fat saturation can be in a region of metallic prosthesis), susceptibility artifacts (large susceptibility artifacts are commonly seen surrounding ferromagnetic objects inside of diamagnetic materials).

The role of Medical Technician Radiologist is to check not only the patient in order to avoid having ferromagnetic substances and items, but he/she is also responsible to be in contact with specialist engineers so as to prevent situations of radio frequency interferences or other electric components as well.

Objectives: Artifacts of technical disorders in homogeneity

P 06

BIOLOGICAL RESULTS ON THE FETUS FROM IONIZING RADIATION

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Purpose: In this report there will be presented the effects of ionizing radiation at the fetus and the necessary radioprotection.

Methods and Materials: The biological results on the fetus, caused by the irradiation, depend on the dose of ionizing radiation that it receives and the phase of its evolution. The imminent effects of the irradiation can cause the fetus's death, abnormalities and mental retardation, which are the result of overdose. The effects are carcinogenesis and leukemia, which are relative to the acceptable irradiating dose at the fetus and accounts about 0,015% per 1 mSv. The effects of ionizing radiation depend on the phase of the fetus's evolution:

1st phase (1st - 2nd week): presence of low danger.

2nd phase (3rd - 8th week): for doses >100 mSv there is the possibility of dysplasia.

3rd phase (8th week - birth): this phase concerns the results with a percentage 0,015% per 1 mSv.

Results: We always must follow some rules of radioprotection and especially at Classical radiation use of necessary protocols (low dose), at Nuclear Medicine use of the right radioisotope and the relative field of irradiation for the protection of the adjacent healthy tissues and at Radiotherapy extreme caution is required regarding the dose and the treatment.

Conclusion: In any case, it is forbidden to end a pregnancy when the pregnant undergoes medical exams, in which the uterus is in the beam of irradiation. The radiographer must always discuss the possibility of pregnancy.

Objectives: Irradiation, pregnancy, uterus, medical exams, possibility of dysplasia

P 07

Picture Archiving and Communication System (PACS)

NIKOLAOS PLATANIOTIS, VASILEIOS SYRGIAMIOTIS, IOANNA NIKOLAOU, ILIAS ABATZIS
STRAEPT, athens, Greece

Introduction Picture Archiving and Communication System (PACS) has a significant impact in Radiology. It is consisted by a data based system which requires strong processors in order to archive , communicate and retrieve images for diagnosis and process .

Materials And Methods Regarding the well organizing new Department of our Hospital with 222 beds, the installation of PACS was considered such an urgent.

We took into consideration:

- the possibility of hospital merging
- the need of cost reduction in imaging material
- better use of imaging dept. space
- improve image quality
- become more competitive in quality of services providing

We had to select for the vendor, based on the:

- knowledge
- ability to provide full service and technical support
- ability to provide upgrades when necessary
- ability to educate our personnel in using it

Afterwards the education, of the qualified staff which was going to be involved with such a data base , had to be done. The education program was comprehended with applications and potential inaccuracies

The PACS was also intergraded by the Radiology Information System

(RIS) which it is supposed to be essential for the best administration of the patients and the archives.

Results: The performance of PACS was evaluated after 8 years of operation based on:

also hospital is unique in using PACS

Economic upgrade

Improved health services

Conclusion: The proper planning installation and implementation of PACS even in a small Community Hospital may result in significant savings and improvements of the services quality .

Objectives: Picture Archiving and Communication System (PACS)

P 08

Post Mortem T2 relaxation time analysis using an animal model

Csaba Vandulek, Viktoria Magyar, Thomas Donko, Peter Bogner, Imre Repa
Kaposvar University, Health Center, Kaposvar, Hungary

Introduction

Our study aimed to test the feasibility of using the T2 relaxation time of muscle for modelling the time of death. T2 relaxation time is an important parameter which is measurable using an MRI scanner. Through the use of an animal model we performed repeated measurements for analysing the post-mortem changes in muscle.

Methods

For the pilot study we used a 4 year old and a half year old rabbit. The imaging took place on a 1.5T MRI scanner. Image acquisition used a 16 echo T2 weighted SE sequence. Imaging took place in specified time intervals following the death of the rabbits. Slices were obtained in the axial plane covering the longissimus dorsi. Matlab[®] software was used for data analysis.

Results

T2 relaxation times of the muscle tissue were measurable in both the young and old rabbit. The post mortem relaxation times of the young rabbit were slightly lower than of the old rabbit. The temperature of the muscle tissue decreased while the moisture content of the muscles examined was constant. The T2 relaxation times increased following the death of the rabbits. Significant change of the T2 relaxation time was observed in the first eight hours following the death of the rabbits.

Discussion

The results of the post mortem study demonstrated the correlation between T2 relaxation of muscle tissue and the change in time following death. This was best observed in the first eight hours following death which can be used to depict the time of death.

Key words: T2 relaxation time, post-mortem, MRI

Objectives

1. Demonstrate radiographers role in research radiography
2. Demonstrate the use of MR techniques for post mortem imaging
3. Show a feasible protocol for acquiring T2 relaxation times of muscle tissue
4. Show the relationship between change in temperature and change in T2 relaxation time following death.

P 09

BREAST CANCER - POSITIONING AND ACCURACY IN EXTERNAL RADIOTHERAPY

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Escola Superior de Tecnologia da Saúde de Lisboa, lisbon, oriente, Portugal

Purpose: Positioning is an important key in radiotherapy treatment contributing to its effectiveness and accuracy. This article aims to search for an appropriate positioning in order to maximize the treatment results and minimize negative effects on critical organs, such lungs and heart.

Materials and methods: A literature review has been done in medline and pubmed using several keywords to identify medical articles about breast cancer positioning in radiotherapy treatment, in the last 5 years.

Results: The articles analyzed introduced an alternative positioning in external radiotherapy for breast cancer, those refer as advantage a better dose homogeneity received by the breast and lower dose received by critical organs. In ILD (Isocentric Lateral Decubitus) technique the patient is positioned in lateral decubitus and the contralateral breast is retracted out of the irradiation field to minimize the dose received, this technique has been studied by Campana et al. Other two studies, McKinnon et al and Chino et al, experiment to radiate breast cancer in the ventral decubitus position, with the aim to reduce the inhomogeneity of the dose. Tho et al has studied the supraclavicular radiotherapy treatment which is administrated in the t-grid 90°-grid positioning, to relate their skin toxicity. However, some positions are just more beneficial in patients with prominent breasts.

Discussion: Despite of being used accessories to tie the position of patient breasts, the advantages for positioning in ILD or in prone decubitus are the same, but this last have a better reproducibility.

Keywords: Accessories; External Radiotherapy Accuracy; Positioning; Radiotherapy; Reproducibility.

Objectives

- Define why effectiveness and accuracy are important to radiotherapy treatment;
- Introduce to different ways of positioning;
- Inform radiation therapist and other professional relate to them about the pros and cons of each positioning;
- Choose a positioning to maximize treatment results and minimize radiation effects on critical organs.

P 10

Biological effects of ionizing radiation

Vasileios Syrgiamiotis, Nikolaos Plataniotis, Theodoros Panou, Maria Dousi, Kon/nos Georgiadis, Ioanna Nikolaou
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Abstract

Ionizing radiation is a radiation oh high energy contrary to non ionizing radiation. Ionizing radiation is able to produce ionization of the atoms in order to break chemical bonds and cause undoubtedly harm in cells. The ionization of an atom follows the interaction of high energy radiation with matter.

The most common known types of radiation are the x rays , the radiation α , β , γ . The ionizing depending on their type and energy.

Nowadays , ionizing radiation is widely used in medicine, industry (Sterilization of medical equipment), energy production, research and education. Ionizing radiation comes also from natural sources, contrary to what it has already been mentioned, which was man made. Natural sources are part of the environment and include the elements of the ground of the earth and the cosmic radiation. The soil, the water and the air include natural radioactive elements.

Exposure to high doses of ionizing radiation can result in the destruction of many cells, which can result in skin irritation, burns, serious damage in vital organs, or even death, depending on the size of dose. Moreover, exposure to radiation may result in future carcinogenesis or other kinds of abnormalities. Such effects are called stochastic because there is the probability of harm which increases with the size of dose. The effective dose (the dosimetric quantity which is related to the probability of stochastic effect), is expressed in sievert (Sv) and depends on the absorbed dose.

Objectives

The effective dose (the dosimetric quantity which is related to the probability of stochastic effect), is expressed in sievert (Sv) and depends on the absorbed dose.

P 11

Computed Tomography Technique in Acute Stroke Imaging

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Abstract

Material and Methods

Patients over 18 and under 85 years old with an acute stroke less than 4½ hours since the starting of the symptoms.

CT Technique

1. Baseline unenhanced CT to rule out hemorrhage
2. Intravenous thrombolysis is initiated
3. Baseline CT to localize the basal ganglia to position the perfusion study
4. Dynamic first pass CT perfusion (CTP)
5. Vertex to arch CT Angiography (CTA)

Objectives

1. To present the protocol we use to study patients with acute stroke
2. To address the conditions we have to know before starting the study (patient allergies, adequate size of venous line)
3. Selection of the four perfusion slices at the level of the basal ganglia
4. To determine the adequate injection and volume rates to obtain adequate multiparametric perfusion maps

P 12

Tumour oxygenation, Hypoxia and its implications in the efficiency of the Radiotherapy treatment

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Abstract

Tumor oxygenation is a condition that influences the therapeutic results of Radiotherapy. The purpose of this article is understand how Hypoxia affects Radiotherapy outcomes. Scientific articles published in MEDLINE for the past 5 years were reviewed .

Our conclusions appoint to intra-tumor Hypoxia as a pathophysiological characteristic often present in a large number of advanced solid tumors, which can negatively affect tumor radiosensitivity.

A proper intratumoral oxygenation is necessary to obtain the expected therapeutic outcomes, as it assumes an important role in the optimization of the citotoxic activity of ionizing radiation during Radiotherapy.

Keywords: Radiotherapy, Tumor oxygenation, Hypoxia, Radiosensitivity, Therapeutic results of radiotherapy.

Objectives

1. Understand the relevance of tumour Hypoxia during radiotherapy;
2. Identify factors that have been associated in the development of hypoxic regions in most solid tumours;
3. How Hypoxia may influence tumour progression;
4. How we improve Hypoxia in radiotherapy.

P 13

IGRT - Improving Patient Care

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Purpose

Image-guided radiotherapy (IGRT) can potentially improve the accuracy of the treatment by providing high-quality online images of patient's anatomy in the treatment position in the treatment room.

The Cone-Beam CT is a non invasive, fast and radiologically safe technology that provides IGRT and a more accurate method of position verification just before treatment.

The purpose of this communication is to demonstrate the improvement of patient care with the routine use of IGRT with a Cone-Beam CT.

Materials and methods

The process used for IGRT implementation starts with an evaluation of available tools; installation and basic learning for the handling of a new technology; validation by comparison with a standard method (2D portal verification); analysis of the advantages and disadvantages of treatment verification with Cone-Beam CT (ELEKTA Synergy® S) through literature review.

Results

The Cone-Beam CT proved to be a reliable tool regardless of frequent image artifacts due to longer exposure time (movement related). Even though the 3D images acquisition requires more time than the 2D method, it delivers a smaller dose to the patient.

The use of two verifications systems (one of which validated previously) allowed for a comparison of the results and confirmation of the potential and real benefits of this new technology.

Conclusion

The integration of this new technique in daily practice enables the administration of more complex treatments with greater safety which has the potential to translate in to better tumour control and reduced toxicity.

Keywords: Image-guided Radiotherapy; Cone-Beam CT; Treatment Verification

Objectives

1. Cone-Beam CT as an IGRT technology.
2. Comparison between 2D and 3D image registration.
3. Advantages and disadvantages of treatment verification with IGRT.
4. The improvement of patient care with the routine use of IGRT with a Cone-Beam CT.

P 14

The role of radiographers in developing of medical prosthesis using rapid prototyping

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Purpose

The aim of the study is to present the application of reverse engineering into individually adjusted cranioplasty prosthesis manufacturing and the role of radiographers in this procedure.

Material and Method

In 15 patients with skull focal bone deficit after craniectomy CT was performed using dedicated high resolution protocol.

The virtual model of the skull was obtained using CAD software CATIA. Models were prepared by the team consisting of radiographer and engineer.

In every case the material model of the skull focal bone deficit was produced using Computer Numerical Control Milling (Arrow 500) and polyurethane resin Prolab 60. It could be used by a neurosurgeon for individual manual adjustment of a universal prosthesis before surgery (Fig.1). The prosthesis was sterilized.

In every case, the prosthesis was implanted into patient during neurosurgery.

Results

Previously the universal prosthesis for cranioplasty was manually adjusted to a bone deficit by a surgeon, which could take from 15 minutes till 1 hour. In many cases fitting was not good enough.

After the application of reverse engineering technique, time needed for adjustment was reduced to a few minutes. Additionally, the prosthesis was much better fitted.

Conclusion

In the patients planned for cranioplasty with synthetic material, manufacturing of individually adjusted prostheses using reverse engineering should be commonly used, reducing time needed for neurosurgery and improving the prosthesis fitting. The radiographer is important person in the team.

Reverse engineering technique, cranioplasty prosthesis, cranioplasty procedure

Objectives

1. Usefulness of CT CAD software in preparing virtual model of the skull
2. Application of reverse engineering into individually adjusted cranioplasty prosthesis manufacturing
3. Role of radiographer in the procedure
4. Comparison of usefulness of universal prosthesis versus individually adjusted prosthesis

P 15

Head Injury From Military Firearm, Fired From Close Distance

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Admission- Purpose

Two children of 11 and 14 years of age, were admitted to Metropolitan Hospital, Athens, Greece, with head injury from military firearm, fired from close distance, in critical condition.

They were operated immediately and the bullets were removed from the brain of both children. After the surgical removal of the bullets, the condition of their health went remarkably well. The 14 year old boy had no problem whatsoever, while the 11 year old boy, one month after the operation, suffered from a minor partial paralysis of the left facial nerve.

Method

Both children were CT scanned with MRCT of 16 slices per rotation. The examination was performed at 1.120KV pitch, 210 MAS, the rotation time was 0.7 sec, and the slice thickness was 1mm.

Reconstructions were carried out at sagittal and coronal level, as well as 3D reconstitutions. They both had face and profile X-ray examination.

Results

After the surgery the condition of both children was very good. Shortly after the surgery the 14 years old boy had no problem at all, while the 11 years old suffered from a minor paralysis of the facial nerve on the left side of the face.

Objectives

Head injury - firearm - children - surgical removal

P 16

CT guided Radiofrequency ablation for lung cancer. Radiographer's role.

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Abstract

Percutaneous Radiofrequency (RF) ablation consist of the application of RF waves that generate frictional heat, coagulating the tissues.

The radiographer plays an important role during the RF technique:

First of all a CT is required to locate the best path to puncture the lesion.

Once the physician has introduced the Rf needle the radiographer selects the power of the RF waves and increases it progresely, till the impedance reaches the maximum level. This procedure must be done twice.

Then a control CT is mandatory to detect possible complications and check the lesion.

Finally, the next day a Perfussion CT is adquiered to check if the lesion has been completely burnt and detect more complications.

Objectives

1. To show the role of the radiographer during the procedure.
2. To describe the RF ablation of pulmonar lesions.
3. To compare the safety and effectiveness of the RF ablation with other treatments.

P 17

"Venous Access Port: How, why and some statistics."

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Abstract

1) Using ultrasound and fluoroscopi: patients no longer need narcosis, instead the procedure only requires local anesthetic.

2)The use of these methods also increase accuracy in the location and placing of the catheter and reduces complications such as pneumothorax, air embolism, catheter disconnection or fragmentation, catheter rupture and haemothorax.

X- ray technician:

Prepare lab and equipment prior to exam, positions patient, ensures EKG equipment and pulsoksimeter are correctly in place and assist the radiologist during the procedure.

Indications:

Repeated intra- venous administration of chemotherapy, antibiotics, anti-viral drugs, parenteral nutrition, blood sampling or transfusion.

Patient group:

Primarily cancer mamma, gynecological cancer patients and various types of sarcoma.

Catheter position:

First choice: vena jugularis interna dxt because technical it's easier to puncture as it's more superficial and larger than the left one.

Statistics:

- We implant 220 ports per year.
- We experience less complications such as infections, fibrin sheath formation, catheter occlusion and pinch off since using vena jugularis interna instead of vena subclavia.
- We experience only 1 or 2 port migrations each year.

Our choice of catheter:

8.5 F silicone catheters as they tolerate certain contents of the chemotherapy better than polyuretal catheters.

Most common complications today:

Badly placed venous access port needle, no back-flow, infections.

Objectives: Indications, Patient group, Statistics, Most common complications today

P 18**SIGNIFICANCE OF OPTIMIZATION and QUALITY ASSURANCE PRACTICES IN RADIATION SAFETY**

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Purpose: The purpose of this study is to define with examples from other studies the significance of optimization and quality assurance in medical radiation practices that corresponds to 90% of the public dose among artificial radiation sources.

Significance: Regulations such as "Council Directive Euratom 96/29" issued by European Union, and Basic Safety Standards series issued by International Atomic Energy Agency, and Radiation Safety Regulations dd. 24.03.2000 issued by "Türkiye Atom Enerjisi Kurumu" (Turkish Atomic Energy Authority) are in effect about the above mentioned matter ... **Method:** Examples from quality controls of radiological devices, dose mapping for 3-dimensional irradiation, and patient/employee exposure minimization trainings within the scope of radiation safety trainings, and film repetition studies carried out by "Göztepe Eğitim ve Araştırma Hastanesi Radyasyon Güvenliği Komitesi" (Göztepe Education and Research Hospital Radiation Safety Committee) are presented... **Conclusion:** Quality assurance and optimization practices in hospitals are significant by means of reducing patients' and employees' radiation exposures. Practices on optimization and quality assurance of medical irradiations provide guidance for hospitals on practising Basic Safety Standards for Protection against Radiation.

Key Words: Quality Assurance, Radiation Safety, Optimization of Radiation Protection.

Objectives

1. to show importance of optimization and quality assurance practices in Radiation Safety
2. Examples of Quality controls of radiological devices, dose mapping for 3 dimensional irradiation for radiological Unites which are planning to start Quality Assurance Programs
3. Importance and significance of radiation safety trainings in one Education and research Hospital in Turkey
4. Examples of Film repetition Studies and corrective actions in Radiology Unit.

P 19

A RESEARCH ON PROFESSIONAL DEVELOPMENT SKILLS TO BE ACQUIRED BY RADIOGRAPHERS

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Abstract

For health care industry, emerging technologies, new methods, new machines increase the need for health personnel who can integrate with the world, who can follow the research and whose information is renewed. Starting from these needs, the syllabus which is followed by vocational health schools for radiographers must be revised according to the needs of health care industry. In Turkey, this type of research is carried out by IKMEP (HRD-VET **Human Resources Development Through Vocational Education And Training Project**) which is participated by Council of Higher Education and Ministry of Education. Within the scope of this project, the development of human resources is encouraged by improving the education quality and modernization of vocational education, with the cooperation between the labor market and vocational and secondary education purposed for employment. This research within the HRD-VET includes tasks, competences, analysis of tasks, and modules which are the needs for a radiographer who is graduated from the fifth level and who renews his/her information. A radiographer who is educated with this approach can follow the scientific studies and participate them, can contribute the scientific organizations, can join the professional organizations and have information about his/her legal rights.

Key Words: Radiographer, professional development, Vocational Health School

Objectives: Improving education quality, professional development, learning new information about radiography

P 20

A RESEARCH ON COMPETENCES TO BE ACQUIRED BY RADIOGRAPHERS TO WORK IN NUCLEAR MEDICINE DEPARTMENT

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Abstract

Fast globalism and emerging technologies cause countries to improve the development of human resources. In Turkey and in the World, emerging technologies in the health care industry involve the description of the labor force and employment which are needed. For supplying a well-qualified labor force, firstly vocational descriptions, standarts, missions and duties must be described. In Turkey, this type research is carried out by IKMEP (HRD-VET **Human Resources Development Through Vocational Education And Training Project**) which is participated by Council of Higher Education and Ministry of Education. Within the scope of this project, the development of human resources is encouraged by improving the education quality and modernization of vocational education, with the

cooperation between the labor market and vocational and secondary education purposed for employment. This research within the HRD-VET includes tasks, competences, analysis of tasks, and modules which are the needs for a radiographer who is working in nuclear medicine department and graduated from the fifth level and who renews his/her nuclear medicine information.

Key Words: Nuclear Medicine, Vocational Health School, Radiographer

Objectives: Developing skills for radiographers who are working in nuclear medicine department

P 21

A New Concept in Health "Green Hospitals" and A Study on Managing of Radiology Departments

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Abstract

Nowadays the radiology managers have the task to closely follow up the developments and innovations in the health area and consider emerging concepts in their managerial works. In this sense, today in the construction of hospital facilities a new concept that is treated as "green" must be adopted and implemented by the radiology managers in consideration with internal, external customer satisfaction enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality. Although there are studies in the area of hospital construction and structuring of radiology departments, there is still a lot to do. Radiology managers, employees have to be involved in the "green building" applications in order to build a functional and safe department. In 2000, U.S. Green Building Council (USGBC), Leadership in Energy and Environmental Design revealed the Green Building concept. Green hospitals can better interpret the health of the community, the patients and the medical staff. In the light of this approach, radiology managers and the management of the radiology departments have to plan the needed equipment and sources, train the staff how to react in case of possible risks and how to report these risks in order to manage and secure the departmental works.

The radiology manager must consider the criteria of three lead organizations in his management works. At hospitals constructed according to the "Green Building" principles; safety, hazardous materials, medical equipment support methods, internal communication quality, environmental pollutants can be planned, implemented and managed.

Key words: Green hospital, department management, building safety

Objectives: Effective management of the radiology unit, internal and external customer satisfaction, to learn new methods and applications

P 22

A Research do the job on Department of Management Radiology Administrators "Management and Organization"

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Abstract

Rapid developments in science and technology, new methods in the medicine, to use this developed technology and these tools effectively and occurately, technical teams and to carry out the task well equipped radiology administrators are needed. Development of human resources through vocational education in Turkey and European countries in the field of health education and the standardization of curriculum for the study was initiated. Ministry of Education and higher education institutions jointly run the IKMEP-HRD-VET (Vocational Education through Human Resources Development Project) a study

being carried out. Under this project, the labor market and vocational schools and vocational technical secondary schools for employment between the union by ensuring the lifelong learning perspective, the modernization of vocational education and increasing the quality of human resources development through the promotion are intended. Study was carried out under IKMEP as a result of a series of studies, on those five whom have graduated from medical imaging technician, in the level of the management functions of the department in fulfilling their need to know the values that management will be given. After this Project created draft standards and Professional competencies in the statements of the management one, can achieve proficieny “Medical European countries that apply in our country and the professional Imaging Technician of the” vocational training (Level 5) and employment after graduation that can be used in all the information and skills training places, the necessary processes, process analysis and the modules contained. Keywords: Management, professional training, management of radiology department

Objectives: To see collaboration in the mission field of radiology staff, department management and operation closely related to innovation

P 23

The Role of the Radiology Technologist on the Performance of Percutaneous Nephrolithotomy Operation

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Purpose: In this study, we evaluated the role of radiology technologist in determining the correct positioning, aiding the surgeon and decreasing the dose of C arm scopic exams during the percutaneous nephrolithotomy (PCNL).

Methods: During the procedure, fluoroscopic screening was performed using a mobile multidirectional C-arm fluoroscopy unit (Siemens) with an under the couch X-ray tube and an over the couch image intensifier. All operating room personnel wore lead aprons and thyroid shields and surgeon used lead glasses and radio-protective surgical gloves. All percutaneous accesses were gained under fluoroscopic guidance by urologist and radiology technologist.

Results: When the procedure is performed by an urologist and radiology technologist working together, the mean operative time, time to access the collecting system, fluoroscopic screening times, and complication rates were minimal.

Conclusions: Percutaneous nephrolithotomy is a minimally invasive surgical procedure for removal of large renal and upper-ureteral calculi. The procedure is performed most often by a urologist and radiology technologist working together, and the role of the radiology technologist is extremely important in this process.

Objectives: In this study, we evaluated the role of radiology technologist in determining the correct positioning, aiding the surgeon and decreasing the dose of C arm scopic exams during the percutaneous nephrolithotomy (PCNL).

P 24

New Functionalities in MRI: combined analysis of BOLD and DTI techniques

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Key words: BOLD,DTI,MRI

Introduction: Neuronal activity implies an increase of blood flow that can be measured by Blood Oxygen Level Dependent (BOLD) based sequences. The use of Diffusion Tensor Imaging (DTI), on the other hand, allows the assessment and visualization of fiber tracts. The combination of these two techniques enables a better understanding of the connectivity between active brain areas and the corresponding neuronal networks.

Methods: Data were acquired in a 3T Siemens Trio scanner and was comprised of a T1-weighted 3D sequence with isotropic voxels, an echo-planar 2D sequence for DTI data with 20 non-collinear gradient directions and b values of 0,1000 s/mm², and a BOLD sequence. The BOLD functional paradigm consisted of 35s blocks of finger tapping and 35s blocks of rest. Data analysis was done using vendor software.

Results: Finger tapping movement of the right hand activated a focused area in the pre-central gyrus of the contra-lateral hemisphere. DTI allowed tracing of multiple fiber tracts that were well correlated with the active area and the pyramidal tract when diffusion data were merged with the functional maps. Active areas were also observed in the ipsilateral cerebellum in concordance with the role of motor coordination of this brain structure.

Conclusion: The combined use of BOLD and DTI allows for the non-invasive localization of active brain areas such as the primary motor cortex and the associated neuronal fibers. Given its features the combined approach is finding, evermore, a place in clinical practice as a way to optimize surgical planning.

Objectives:

1. Combined analysis of different MRI data
2. Validation of the value of pre-assessment in a normal subject
3. The important role of multidisciplinary teams
4. The application of techniques on the clinical field that have been used for years in the Investigation area

P 25

STEADY-STATE ACQUISITION IN PERIPHERAL MR-ANGIOGRAPHY WITH HIGH RELAXIVITY EXTRACELLULAR CONTRAST AGENT

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Keywords: Paramagnetic contrast agent; steady state; magnetic resonance angiography.

Background: Describe examination technique, main benefits and the diagnostic gain obtained by mr-angiography of peripheral vascular district using steady-state sequences with high relaxivity extracellular paramagnetic contrast agent.

Materials and methods: Examinations were performed with MRI scanner (1.5 T) using phased array coils with parallel assemblage (iPAT) on abdominal-pelvic region and lower extremities, by intravenous injection of high relaxivity paramagnetic contrast agent (Gd-BOPTA 0,5 Mol) with 0.2 ml / kg at 0.8 ml / sec flow. All examinations were performed with a basal acquisition of first pass with Flash 3D T1 sequence and in steady-state with Flash 3D T1 isotropic high spatial resolution sequence (TR: 10, TE: 2.32, FA: 22, Matrix: 448x448, FOV: 320, Thickness: 0.7, Voxel size: 0.7x0.7x0.7, BW: 130, NEx: 1, TA: 4' 30') acquired in the coronal plane. Vascular maps were obtained with post-processing analysis (MIP, MIP curved, MPR).

Results: Steady-state acquisition allows us to modify the diagnosis based on the first pass in the patients with uncorrect images due to wrong timing; it also allowed us to better characterize stenosis degrees detected at the first pass and reduce mr-angiography contrast technical pitfalls.

Conclusion: steady-state image reading is superior to first-pass image reading, but the combined reading protocol is more accurate.

Objectives:

1. illustrating high relaxivity Gd paramagnetic contrast agent;
2. showing phased array coils parallel assemblage (iPAT);
3. showing acquisition with 3D Flash T1 isotropic sequence;
4. illustrating steady state acquisition.

P 26

Diffusion Tensor Imaging

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Objectives: In this article we discuss the theory on which Diffusion Tensor Imaging (DTI) depends on, how can be used in mapping fiber tracts and the information that can be extracted from DTI data.

Methods: In recent years, diffusion tensor imaging (DTI) has emerged as a powerful method for investigating white matter architecture in health and disease. Diffusion in tissue can be either anisotropic or isotropic depending on the characteristics of the tissue. With diffusion tensor imaging, diffusion anisotropy effects can be fully characterized, providing even more exquisite details on tissue microstructure. Diffusion tensor theory is utilized in order fiber tracking algorithms to be applied and information, such as mean diffusivity, degree of anisotropy and main direction of diffusivities, to be extracted.

Results: The results of DTI mapping and fiber tracking are presented.

Conclusion: DTI is a magnetic resonance imaging (MRI) variation that may significantly improve our understanding of brain structure and neural connectivity. Its measures are thought to be representative of brain tissue microstructure and are particularly useful for examining organized brain region, such as white matter tract areas. Studies have probed the potential of diffusion tensor MR imaging in brain tumors, migraines, and eclampsia. Improving the gradient and software performance DTI can be used for studying myocardium disorders.