ESER
ANNUAL SCIENTIFIC MEETING 2015

October 22-23, 2015 | Antalya, TR

Course Programme
WELCOME

Dear Colleagues and friends,

On behalf of the European Society of Emergency Radiology and the Turkish Society of Radiology, it is a special honour for us to invite you to the 4th Annual Scientific Meeting of the European Society of Emergency Radiology (ESER) that will be held at the Kaya Palazzo Golf Resort in Antalya, Turkey on October 22–23, 2015.

For the first time the ESER meeting is part of a joint meeting with TURKRAD2015, the 36th annual Turkish Congress of Radiology. Both societies are looking very forward to this fascinating constellation with opportunities to learn from each other, to experience fruitful discussions and to build up contacts, relationships, partnerships or even, like we did, friendship.

TURKRAD National Congresses form an excellent platform for exchange of latest scientific advancements and experiences as well as a perfect social environment. Combined with the special expertise of ESER in Emergency Radiology, we hope this event, with the power of being a joint meeting, provides a very dynamic, stimulating and satisfactory environment for all of our participants.

We encourage all of you to enjoy one of the most known locations at the Turkish Riviera, Antalya that dates back to 150 BC, when it was founded as a seaport to the ancient Pamphylian city of Perga, with its famous ruins of ancient civilizations and sights of astonishing natural beauty with our social and cultural events.

With your presence and contribution, the 4th Annual Scientific Meeting of the European Society of Emergency Radiology (ESER) and the 36th Turkish Congress of Radiology will be bound to be a most rewarding reunion at very high scientific and educational standard.

We wish you a very successful and enjoyable meeting in this wonderful country.

Sincerely yours,

Stefan Wirth, M.D., MSc. MBA  Abdulhakim Coskun, M.D.
ESER Congress President  TSR Congress President
European Society of Emergency Radiology  Turkish Society of Radiology
THURSDAY, OCTOBER 22, 2015

08:30 Welcome address
A. Coskun, Kayseri/TR; S. Wirth, Munich/DE

09:00 Scientific Session
F. Berger, Amsterdam/NL; S. Wirth, Munich/DE
09:00 Soft Tissue Evidence of Head Injury in Infants and Young Children: Is CT head Examination justified?
S. Zaman, Liverpool/UK
09:15 iPad may replace diagnostic monitor for diagnosis of pneumothorax
G.K. Atac, Ankara/TR
09:30 Arterial and venous multiphase CT-scan in patients with internal bleeding after thoracoabdominal trauma: do we need the separate arterial phase?
G.S.R. Muradin, Rotterdam/NL
09:45 Can Radiologist’s Experience Make a Difference in MDCT evaluation of bowel obstruction?
N. Civitareale, Chieti/IT
10:00 Paediatric skull X-Rays and CT brains for trauma- a review of practice in our hospital
E. Hall, Liverpool/UK
10:15 The relation between the severity of appendicitis on computed tomography and mean platelet value, red cell distribution width and neutrophil/lymphocyte ratio
E. Ozan, Ankara/TR

10:30 Coffee Break

10:45 Imaging in Polytrauma
A. Coskun, Kayseri/TR; M. Reiser, Munich/DE
10:45 Logistics and management of critical patients (TATD)
H. Akoglu, Istanbul/TR
11:05 Advanced trauma life support for radiologists
F. Berger, Amsterdam/NL
11:30 Chest and Abdomen, mechanisms of injury and protocols
M. Scaglione, Castel Volturno/IT
11:55 Role of IR
G. Goh, Melbourne/AU
12:20 Pediatric polytrauma: Is there any difference?
V. Miele, Rome/IT
12:45 Discussion

13:00 Lunch Break
THURSDAY, OCTOBER 22, 2015

14:30  TSR, TATD & ESER joint session
Discuss critical cases & Lessons we learned
L. Romano, Naples/IT; J. Wildberger, Maastricht/NL
14:30  R. Basilico, Chieti/IT
14:50  G. Pekindil, Manisa/TR
15:10  I. Oran, Izmir/TR
15:30  E. Akpınar, Ankara/TR; B. Erbil, Ankara/TR
15:50  Discussion
**FRIDAY, OCTOBER 23, 2015**

<table>
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<tr>
<th>Time</th>
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| 08:30  | **Emergent Neuroimaging**  
E. Akpinar, Ankara/TR; F. Danza, Rome/IT                                                                 |
| 08:30  | **CT in Trauma: What you can’t miss**  
A. Akgoz, Ankara/TR                                                                                   |
| 08:55  | **Cervical Spine: Pearls and pitfalls**  
G. Schueller, Opfikon/CH                                                                               |
| 09:20  | **Acute stroke/IR in stroke**  
C. Calli, Izmir/TR                                                                                     |
| 09:50  | **Non traumatic Intracranial Hemorrhage**  
F. Berger, Amsterdam/NL                                                                               |
| 10:15  | **Discussion**                                                                                       |
| 10:30  | **Coffee Break**                                                                                     |
| 11:00  | **Critical issues in acute non-traumatic thoracic emergencies**  
F. Berger, Amsterdam/NL; N. Karabulut, Denizli/TR                                                      |
| 11:00  | **Chest pain: AAS, ACS, PE is triple rule out still an issue?**  
M. Karcaaltincaba, Ankara/TR                                                                         |
| 11:25  | **Aortic emergencies**  
T. Hazirolan, Ankara/TR                                                                                 |
| 11:50  | **Pulmonary infections**  
N. Karabulut, Denizli/TR                                                                                 |
| 12:15  | **Discussion**                                                                                       |
| 12:30  | **Lunch Break**                                                                                       |
| 13:30  | **Critical issues in acute non-traumatic abdomino-pelvic emergencies**  
G. Schueller, Opfikon/CH; U. Linsenmaier, Munich/DE                                                      |
| 13:30  | **The acute bowel**  
M. Erturk, Istanbul/TR                                                                                  |
| 13:50  | **Emergencies of non-gynecologic origin**  
D. Akata, Ankara/TR                                                                                    |
| 14:10  | **Emergencies in Oncologic Imaging**  
F. Berger, Munich/DE                                                                                   |
| 14:30  | **Discussion**                                                                                       |
| 14:40  | **Coffee Break**                                                                                      |
FRIDAY, OCTOBER 23, 2015

15:00  Emergency radiology – The real life  
       G. Pekindil, Manisa/TR; S. Wirth, Munich/DE

15:00  The role of radiology in massive pelvic bleeding in trauma patients  
       W. Jaschke, Innsbruck/AT

15:20  Drop your fear: First night on call/what not miss guide for young residents  
       E. Dick, London/UK

15:45  ER in Western, Middle and Eastern Europe: Cultural Clash or symbiotic drivers? What can we learn from each other?  
       U. Linsenmaier, Munich/DE; R. Onur, Ankara/TR

16:10  What technicians want to know but seldom ask  
       A.D. Karaosmaoglu, Ankara/TR; R. Onur, Ankara/TR

16:35  PLENARY SESSION TSR AND ESER  
       Is there a joint mission – Discussion  
       C. Calli, Izmir/TR; S.M. Erturk, Istanbul/TR; M. Scaglione, Castel Volturno/IT
CME ACCREDITATION

The ESER Annual Scientific Meeting 2015, October 22-23, 2015, is granted 11 European CME credits (ECMEC) by the European Accreditation Council for Continuing Medical Education (EACCME).

DISCLOSURE STATEMENTS

Potential Conflict of Interest Disclosures
It is the policy of the ESER - European Society of Emergency Radiology to ensure balance, independence, objectivity, and scientific rigour in the congress programme. Knowledge of possible relationships with sponsors of any kind is mandatory in order to reinforce the educational and scientific message and to relieve any suspicion of bias.

Any potential conflict of interest involving the organising committee should be made known so that the audience may form their own judgements about the presentation with a full disclosure of the facts. It is for the audience to determine whether the presenter’s external interest may reflect a possible bias in either the work carried out or the conclusions presented.

S. Wirth: GE Healthcare
FACULTY

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A. Akgoz, Ankara/TR  
H. Akoglu, Istanbul/TR  
E. Akpinar, Ankara/TR  
R. Basilico, Chieti/IT  
F. Berger, Amsterdam/NL  
F. Berger, Munich/DE  
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Congress Center of Kaya Hotel
Üçkum Tepesi Mevkii
Belek / Antalya - Turkey

Certificate of Attendance
The Certificate of Attendance/CME Accreditation will be handed out on the last congress day at the registration desk.

Conference Language
The meeting will be held in English. No simultaneous translation will be offered.

Badge
You are kindly asked to keep your badge visible on the congress grounds at all time.

Onsite Registration Fees
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<tr>
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Registration fee for delegates includes:
- admittance to all scientific sessions
- admittance to the technical exhibition
- congress programme and abstracts
- certificate of attendance
- welcome reception
- coffee and lunch breaks

Member Registration
Available for ESER 2015 members in good standing.

Junior Registration
Available for radiologists, physicians or scientists in training residing in Europe until the age of 35 (incl. 35 years). A proof of your junior status has to be shown at the registration desk.

Student Registration
Available for students under the age of 30. A proof of your student status has to be shown at the registration desk.

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Onsite payment can only be made by credit card (Visa or Euro/Mastercard) or in cash (Euro).
Please understand that no other payment facilities like cheques, etc. will be accepted.
**Name Changes**
Name changes will be treated like the cancellation of the registration and a new registration of the other participant.

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This area offers you an overview of future meetings in the field of radiology and related disciplines, from all over the world. Feel free to contribute flyers and posters to promote your own meetings and courses.

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Video- or audio-recording of any sessions or presentations is not allowed without the speaker’s/organiser’s prior written permission.

**Mobile Phones**
Please do not forget to switch off your mobile phones before entering any of the lecture rooms.

**Safety**
The safety of all congress delegates and participants is of utmost importance to ESER. Security measures and precautions at the ESER venue have been tightened to ensure maximum security for all attendees. Badges must be worn visibly on the congress grounds at all times. The ESER reserves the right for staff to check participants’ identification upon admission to and/or inside the congress venue. Participants may at any time be requested to present adequate proof of identity in the form of a passport, driver’s license, national or military identification or student ID. Documents for the proof of identity must include a photograph and signature.

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2015

Wednesday, October 21, 2015
21:00–23:00 (local time)
at the Kaya Palazzo Hotel VIP Lounge Bar
near the seaside at the hotel

The ESER Office may not accept liability for personal injury, loss/damage to property, personal or otherwise belongings of participants and/or accompanying persons, either during or as a result of the evening event.
Soft Tissue Evidence of Head Injury in Infants and Young Children: Is CT head Examination justified?

S. Zaman¹, S. Harave², C Landes²; ¹BSc (Hons), MBChB, MRCS, DCH. Radiology Registrar, Mersey School of Radiology; ²Department of Radiology, Alder Hey Children’s NHS Foundation Trust, Liverpool/UK

Purpose
The NICE head injury guidelines 2014 continue to recommend CT head examination for children under 1 year of age who present with a bruise, swelling or laceration of more than 5cm following head injury. The aim of this study was to determine whether this practice is justified in children presenting to a Paediatric Accident and Emergency Department in the North-West of England. Further aims were to determine whether there was any justification for performing CT head examination in children with soft tissue injuries measuring less than 5cm, or in children over 1 year with evidence of soft tissue injury but without any other concerning feature.

Methods and Materials
Children under 3 years of age presenting with soft tissue evidence of head injury between May 2011 and Oct 2014 and whom subsequently underwent head CT were retrospectively identified from radiology requests.

Results
91 CT head examinations met the criteria for inclusion. Of these, 45 examinations demonstrated skull fractures and 5 examinations identified intracranial haemorrhage. 44 requests included soft tissue evidence of head injury as the sole reason indicated for CT head examination. Of these, 20 examinations demonstrated skull fractures and 1 examination identified intracranial haemorrhage.

Conclusion
Soft tissue evidence of head injury as the sole reason for CT head examination appears to be justified in our patient population. Furthermore, this study suggests that CT head examination should also be considered for children with soft tissue injuries of less than 5cm and for children aged between 1 and 3 years.
iPad may replace diagnostic monitor for diagnosis of pneumothorax

G.K. Atac, E Sanhal, T Kaplan, A Alhan, Y Akkas, B Kocer; 1Dept. of Radiology, Ufuk University Medical School, Ankara/TR; 2Dept. of Thoracic Surgery, Ufuk University Medical School, Ankara/TR; 3Dept. of Biostatistics, Ufuk University Medical School, Ankara/TR; 4Dept. of Thoracic Surgery, Numune Hospital, Ankara/TR

Body
Radiographic diagnosis of pneumothorax (Px) is crucial for management of acute onset chest pain. Softcopy reading replaced hard copies for a decade or two. Diagnosis of Px may be necessary in emergent circumstances and consultation through internet may become necessary. Use of iPad for teleradiology purposes evaluated for different scenarios for CT or MRI but not for digital radiography pictures widely.

Purpose
The aim of the study is to investigate if iPad can replace 3 K monitor in diagnosis of pneumothorax.

Methods and Materials
Two radiologist (5 (R1) and 20 (R2) years of experience) evaluated a set of 40 chest radiographs including 35 patients with and 5 without Px on diagnostic monitor of 3 K resolution (Barco) and first generation ipad device. Presence or absence and side of the Px, thickness of the pleural space in the largest part, presence of haemothorax, most helpful diagnostic finding, level of confidence and quality of the images were asked. Well known performance evaluation software (ViewDEX) were used for information gathering (figure). Kappa analysis was performed for intra and interobserver variability and Cronbach’s alpha for reliability.

Results
Both observers agreed side of Px and separation width of pleural space better in iPad to the monitor (kappa .791 vs .920). Agreement on presence of haemothorax was better for iPad too (kappa .561 vs .781). Comparison of confidence levels, quality of the images and time for evaluation were not similar in different devices for both radiologists. R1 spent more time with monitor than iPad during evaluation session. Both observers lost little confidence in iPad than 3 K monitor while R1 described higher image quality for iPad against R2. Mean consumed time for R1 and R2 for evaluation of each case were 144 vs 72 sec and 39 sec vs 44 sec for 3K monitor and iPad respectively.

Conclusion
Teleradiology increased the mobility of consultants while decreasing time to diagnosis period. Diagnostic potential of mobile devices is comparable to standard soft copy reading monitors for CT and MRI images of neuroradiology cases. Even if the dimensions of iPad monitor is smaller than 3K display, two observers showed similar results for evaluation of x ray images of Px patients. iPad monitors may be used for diagnosis of Px patients in emergency settings.
Arterial and venous multiphase CT-scan in patients with internal bleeding after thoracoabdominal trauma: do we need the separate arterial phase?

R.C. Nanda, R.S. Dwarkasing, M. Ouhlous, D. Den Hartog, E.M.M. Van Lieshout, G.S.R. Muradin; ‘Department of Radiology, Rotterdam/NL; 2Trauma Research Unit Department of Surgery, Erasmus MC, University Medical Center Rotterdam/NL

Objectives
To evaluate whether management of internal bleeding differs between patients with arterial blush and patients with only venous blush.

Methods
Retrospective analysis of patients with a multiphase thoracic or abdominal trauma CT from 2010 to 2011. In each phase the finding contrast extravasation was scored as arterial blush or only venous blush and compared with the outcome. The outcome was defined as surgical or radiological treatment intervention for bleeding.
Results
176 patients were included. Forty-three patients had arterial blush and seven patients had only venous blush. In both groups the intervention rate was comparable (72% and 71%, respectively). In patients with contrast extravasation the intervention rate was 100% in patients with hypotension and 67% in patients with normotension. In normotensive patients without contrast extravasation 97% of patients were managed without intervention.

Conclusion
Patient management of internal bleeding seems to be determined by clinical signs of ongoing bleeding and blush on CT irrespective of the phase on which this extravasation is detected.

Can radiologist’s experience make a difference in MDCT evaluation of bowel obstruction?
N. Civitareale, R. Basilico, A Ferri, E. Di Campli, B. Seccia, AR. Cotroneo; University of Chieti, Department of Radiology, Chieti/IT (n.civitareale@rad.unich.it)

Purpose
To evaluate the diagnostic performance of MDCT in the detection of site and cause of bowel obstruction and in the diagnosis of bowel wall ischemia or infarction, by comparing three readers with different experience.

Method and materials
The MDCT examinations of 130 patients with surgical and histological diagnosis of bowel obstruction were retrospectively analyzed by three readers with different experience in abdominal disease: abdominal radiologist, general radiologist and a third year resident. For each reader we calculated the CT concordance with pathology results and the MDCT
diagnostic accuracy in the evaluation of the cause and the site of obstruction and in the
detection of bowel wall ischemia or infarction. For the latter parameter, the sensitivity and
specificity values as well as PPV and NPV were also determined.

Results
The causes of bowel obstruction were: adhesions (36.3%), neoplasms (22.7%), hernias
(13.6%), volvulus (12.5%), other causes (14.7%). The CT concordance with pathology in
determining the cause of bowel obstruction was statistically significant for all readers
(0.77, 0.78 and 0.74 respectively) with diagnostic accuracy values of 83%, 83% and
66.6%. The diagnostic accuracy in defining the site of obstruction was 90%, 83% and
78%, being the proximal ileum the most difficult portion of the bowel to identify as the
site of obstruction. The sensitivity, specificity, PPV and NPV in identifying bowel wall
ischemia or infarction were significantly higher for the abdominal radiologist than the
other two readers (80%, 100%, 100%, 93% for reader 1, 50%, 93%, 67%, 87% for reader
2, 50%, 82%, 50%, 82% for reader 3).

Conclusion
MDCT is accurate in diagnosing the cause and the site of bowel obstruction, although a
specific training would be preferable for residents. The MDCT evaluation of bowel wall
ischemia or infarction is influenced by the radiologist’s experience in abdominal disease
probably because an abdominal radiologist is able to better detect subtle CT findings of
bowel ischemia than general radiologists or residents.
The radiologist’s experience in abdominal disease represents an added value in the
diagnosis of bowel wall ischemia.

Paediatric skull X-Rays and CT brains for trauma- a review of practice in our hospital
E. Hall, D. Hikmat, S. Harave; Alder Hey Children’s Hospital NHS Foundation Trust, Eaton
Road, Liverpool, L12 2AP, UK

Body
Each year, approximately 1.4 million people attend the Accident and Emergency (A&E)
department with a head injury. Of these, 33-50% will be aged under 15 years. Historically,
skull X-rays (SXR) were used to investigate patients presenting with a significant head
injury. However, in September 2003 (subsequently updated in 2007 and 2014), the
National Institute for Health and Clinical Excellence (NICE) published guidelines on the
assessment, investigation and early management of head injury in infants, children and adulst.
These guidelines advised that SXR should not be used to investigate a clinically
important brain injury, with Computed Tomography (CT) recommended as the first line
investigation. SXR are of limited value in the assessment of both minor and major head
injuries and can be falsely reassuring. With CT now being readily-available within the
UK, the SXR can almost never be justified when evaluating a patient with a head injury.
The SXR does, however, remain an important part of a skeletal survey in suspected non-
accidental injury (NAI).

Purpose
Initial audits carried out in our hospital showed that despite the guidelines, the emergency
department clinicians were still reliant on SXR. The audit findings were presented to them
and a policy was implemented to not carry out SXR in these circumstances.
The aims of our project were therefore to:
• Assess our current practice against the guidance regarding the use of SXR and CT in the
investigation of head injuries.
• Evaluate the imaging patterns for SXR and CT brains in the investigation of trauma over a period of five years.

Methods and Materials
This was performed as a retrospective cohort analysis using information obtained and filtered from CRIS (Computerised Radiology Information System). Data outlining the indication and result of the scan was collected for all children from 01/08/09 to 31/07/14. The dose length products (DLP) for CT brains were also calculated for different ages of infants and children on both our current and previous scanners, with an average then taken across the age ranges.

Results
The use of SXR in the investigation of paediatric head trauma has significantly reduced at our hospital, with 78 performed in the 2009-10 period to just 4 performed in 2013-14. The average number of CT studies of the brain in the same time period has not fluctuated significantly, with an average of 210.6 scans performed per year for head injury (range 188-234). The average DLP for the previous scanner was 205.9 and is now 196 for our current scanner.

Conclusion
Our results have shown that adherence to current guidelines, and therefore standards of practice, for the management of head trauma in our hospital have markedly improved over the time period analysed. Reassuringly, there has been neither a significant increase in the number of CT scans being performed, nor a real change in the positive CT pick up rate (17.0% in 2009/10 vs. 18.1% in 2013/14). We can therefore conclude that SXR in the use of investigating head injuries have virtually now been successfully and safely eliminated, thus reducing unnecessary radiation exposure to a large number of children. Furthermore, with the installation of a new CT scanner, the dose reference level has reduced overall across the age ranges, particularly in the 0-1 month age range.
The relation between the severity of appendicitis on computed tomography and mean platelet value, red cell distribution width and neutrophil/lymphocyte ratio

E. Ozan1, G.K. Atac1, A. Alhan2; 1Department of Radiology, Ufuk University School of Medicine, Ankara/TR, 2Department of Biostatistics, Ufuk University School of Medicine, Ankara/TR

Body
Acute appendicitis is the most common acute nontraumatic surgical abdominal emergency. Although many methods are used, diagnosis remains to be challenging. Atypical clinical presentations and appendicitis mimickers can easily confound the diagnosis. The diagnostic accuracy of appendicitis has markedly improved with the advent of computed tomography (CT). In addition, CT can establish accurate determination of the severity of appendicitis. Laboratory markers of inflammation can provide additional evidence to support the diagnosis of acute appendicitis and exclude differentials. Recent studies have investigated the diagnostic accuracy of inflammatory markers including mean platelet volume (MPV), red cell distribution width (RDW) and neutrophil/lymphocyte (N/L) ratio.

Purpose
This study was conducted to investigate the relation between the severity of appendicitis on CT and MPV, RDW and N/L ratio.

Methods and Materials
This retrospective study was conducted at Ufuk University School of Medicine, Radiology Department and included medical records of patients suspected to have the diagnosis of acute appendicitis. Preoperative white blood cell (WBC) count, MPV, RDW, N/L ratio and C-reactive protein (CRP) levels were noted and CT images were reviewed. Two radiologists by consensus, evaluated the CT images and scored the severities based on CT findings via using a 0, 1 or 2 point scale. Appendiceal diameters, appendiceal wall changes, caecal changes, periappendiceal inflammatory stranding, phlegmon or abscess formation and lymph nodes were determined by using this scale. We investigated the relation between CT findings and MPV, RDW and N/L ratio, also performed correlations of these inflammatory markers with CT severity scores. In addition, patients were subjectively classified by using four grades, from normal (Grade I) to perforated appendicitis (Grade IV) on the basis of CT findings to evaluate differences in these markers levels between grades.

Results
CT severity scores were found to be correlated with WBC count, MPV, N/L ratio and CRP levels (p <0.05). ROC analysis found that WBC count, N/L ratio and CRP were significant to diagnose acute appendicitis (p<0.0001). A CT severity score of above 3.5 was allowed for diagnosis (p<0.0001). CT severity score had sensitivity 88%, specificity 90.48%, PPV 91.67 %, and NPV 86.36 %.

Conclusion
CT severity scores were found to be correlated with WBC count, MPV, N/L ratio and CRP levels.
A CT severity score above 3.5 may be helpful as a diagnostic parameter.
Thoraco-abdominal injuries are a significant cause of death in the polytraumatised patients. Early recognition and communication of life-threatening thoraco-abdominal injuries is the major task of the radiologists involved in the emergency room. Although most of these patients reach the hospital alive, lethality continues to remain high. Heart, thoracic great vessels, trachea, bronchus, pleura, lung, diaphragm, abdominal/retroperitoneal, vascular and solid organ injuries are potential cause of death. Any appropriate surgical/interventional management approach must be carried out “around the clock”, before thoraco-abdominal injuries reach the level of clinical evidence. On the other hand, non-operative management has actually become the standard of care for the most serious thoraco-abdominal injuries. These goals become feasible if a correct contrast-enhanced MDCT diagnosis, in a dedicated facility in which the trauma team works effectively 24 h a day, 7 days a week, is performed. Thus, in this lecture, the most serious thoraco-abdominal injuries will be illustrated, with special emphasis on vascular/injuries as well as the value of post-processing techniques, protocols, pitfalls, tips and tricks. Furthermore, the importance of a rational and integrated imaging approach will be pointed out and, finally, the role of the radiologist in the emergency room will be emphasized.

**What is a deceleration trauma?**
1. A systemic disease
2. A compression trauma
3. A direct trauma
4. A neurological disease

**Correct:** 1.

**Which is the best CT protocol approach to trauma patients after deceleration injury?**
1. Whole-body CT with a biphasic injection of iv contrast material
2. Mono-phasic injection
3. Triple phase injection
4. Non-contrast CT

**Correct:** 1.
Discussing critical cases: Acute abdomen

*R. Basilico; Department of Imaging, University of Chieti/IT*

Acute abdomen is a great challenge to the radiologist because differential diagnoses of this clinical condition include a wide spectrum of disorders, ranging from life-threatening diseases to benign self-limiting conditions. Rapid, accurate diagnosis is essential if morbidity and mortality have to be significantly decreased. The diagnostic work-up of patients admitted with acute abdomen is based on various imaging modalities such as abdominal plain film, ultrasound, CT and MRI: the topographic classification of acute abdominal pain (pain in one of the four abdominal quadrants, diffuse abdominal pain, flank or epigastric pain) facilitates the choice of the imaging technique and allows to narrow the range of possible diagnoses. The most practical approach to acute abdomen is to confirm or to exclude the most common disease and to look for general signs of pathology such as inflamed fat, bowel wall thickening, ileus, free fluid, free air, etc: the role of US, CT and MRI in achieving these goals will be discussed. Difficult cases that can lead to a misinterpretation of the diagnosis will be discussed in an interactive fashion. Findings useful for differential diagnoses will be presented in order to obtain the correct diagnosis beginning from the imaging sign.

Unusual cause of acute pelvic pain in woman: Ruptured ovarian endometriotic cyst and its differential diagnosis

*G. Pekindil, Manisa/TR*

Rupture of endometrioma may lead to acute presentation and resultant hemorrhage and fibrosis which creates a complex mass that may simulate pelvic inflammatory disease, hemorrhagic cyst or even malignancies due to elevated CA-125 levels. In this presentation differential diagnosis and imaging findings of these diseases will be discussed.

Discussing critical cases

*I. Oran, Izmir/TR*

The aim of this lecture is to give brief clinical and radiological summary of six critical patients who were presented in emergency room with acute conditions. After definitive diagnosis of the patients which actually were seen rarely in clinical practice, all patients were managed successfully by using various interventional and/or clinical treatments. Previous clinical history revealed percutaneous radiologic interventions in two patients; one was presented with epilepsy, other one was presented with swelling and subcutaneous hematoma. Additional two other patients had previous history of some other medical interventions; one with lumbar disc operation was presented with congestive heart failure, other one with invitro fertilization procedure was presented with transvaginal bleeding. The last two patients had no previous history of hospitalization or medical intervention; one was presented with perforated acute appendicitis accompanied by widespread septic embolism, other one was presented with lower gastrointestinal tract bleeding. After definitive diagnosis, four patients were managed by using various endovascular interventional treatments along with other supportive clinical measures. The remaining two patients were managed supportive clinical measures only.

By giving clinical and radiological summary of these six patients, the lecturer wants to draw attention to some relatively rare clinical and radiological presentations which may be seen in emergency condition. Increased awareness of these rare conditions in turn will result in rapid diagnosis and definitive treatment, including endovascular interventional techniques.
Cervical Spine: Pearls and pitfalls
G. Schueller, Vienna/AT

Predictable Patterns
Radiological findings after specific injuries stereotypical, regardless the level of injury

Traumatizing vector: sum of all forces

Instantaneous axis of rotation

Flexion & Compression: Flexion Tear Drop
Diving into shallow water

Anterior & posterior disruption

Unstable; spinal cord injury

MVA, Falls, Sports
Alcohol, no seat belt, high energy impact

Multiple trauma in 75%

Second peak in the elderly

Moderate Flexion: Wedge Compression
Anterior longitudinal ligament intact

Anterior vertebral body bears force

No posterior disruption

Denis
ABCBS
Stability:
Maintain alignment

Protect neural structures
White and Panjabi

Subaxial cervical spine
- > 3.5mm horizontal translation between two vertebrae
- > 11° angulation between two vertebrae

Jefferson Fracture

Force transmitted through occipital condyles
Possible disruption of transverse ligament
Three or four fragments

Extension

Osseous or ligamentous disruption of all columns
Retrolisthesis
Disc too high!

Extension-Distraction: Hangman’s

4-7% cervical lesions
#1 fatal MVA
Pars interarticularis +/- pedicles, body
Blocked facets predictive for spinal injury

Burst Fracture

Disk fractures into body
Anterior & middle columns
Spinal cord injury

Traumatic vascular injury

Internal carotid artery dissection after trauma
No flow-void sign

Commonly missed: Fluid disc sign
Traumatic disc rupture
Widening of disc space or interspinous space
Associated ligamentous or osseous injuries
Rupture of ALL: anterior disc herniation

Rotation & Translation: Fx-Dislocation

Overroll, ejection
Disruption/comminution
Severe neurologic injury
Unilateral luxation
Bilateral luxation
### Which Patients? How Much Imaging?

<table>
<thead>
<tr>
<th>Condition</th>
<th>Imaging Modality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical spine, adults (low risk)</td>
<td>NEXUS¹, CCSPR²</td>
</tr>
<tr>
<td>Cervical spine, all other adults</td>
<td>MDCT</td>
</tr>
<tr>
<td>Cervical spine, children</td>
<td>NEXUS¹</td>
</tr>
<tr>
<td>Thoracolumbar spine</td>
<td>3-view³ +/−MDCT⁴</td>
</tr>
<tr>
<td>Neurologic symptoms</td>
<td>MRI (&lt;48h)</td>
</tr>
</tbody>
</table>

### Acute trauma settings:

- **No functional imaging!**

### Bondurant type I: Bad prognosis

- Hemorrhagic contusion + hemorrhagic necrosis
- T2 hypointense, T1 inhomogeneous
- Intracellular MetHb (traumat. hypoperfusion) > 8 days

### Bondurant type II: Good prognosis

- Focal interstitial and intracellular fluid collection > edema
- T2 hyperintense ± swelling > 4 h after trauma

### Bondurant type III: Intermediate

- Focal collection of interstitial and intracellular fluid
  - edema + hemorrhage
  - T1 & T2 mixed signal intensities

### Pearls to take home

- **Imaging modality**
- **Injury mechanism, stereotype**
- **Instability, hemorrhage, spinal cord**

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**Chest pain: AAS, ACS, PE is triple rule out still an issue?**

**M. Karcaaltincaba, Ankara/TR**

Chest pain is a vague symptom with many causes. Currently, CT is the most comprehensive test for diagnosing etiology of chest pain. Triple rule out CT can assess AAS, ACS and PE in a single examination. The most important difference between triple rule out CT and dedicated cardiac CT is coverage. Recent developments, trials and prognostic value will be summarized in this context. Introduction of CT for chest pain enabled seeing and diagnosing unsuspected causes that enabled a paradigm shift.
Aortic emergencies
T. Hazirolan, Ankara/TR

Abdominal pain and chest pain are the most common symptoms of patients at emergency departments. Although aortic emergencies constitute a small percentage of the causes of the acute abdominal pain and acute chest pain. All aortic emergencies are life-threatening conditions and they require immediate diagnosis and proper management. Therefore radiologists should be familiar with findings in these conditions. Aortic emergencies include acute aortic dissection, intramural hematoma, penetrating atherosclerotic ulcer, aortic aneurysm rupture, aortic graft infections, mycotic aortic aneurysms, traumatic pseudoaneurysms and traumatic aortic rupture. Multidetector CT and multidetector CT angiography are the imaging examination of choice for the evaluation of this spectrum of aortic emergencies. On selected cases MRI may be required as a problem solving tool. In this lecture, aortic emergencies and their multidetector CT and MRI findings will be presented.

Pulmonary Infections
N. Karabulut, Denizli/TR

Pulmonary infections are common and radiologic imaging plays a key role in the diagnosis and management. The causative organism and imaging manifestations may vary depending on the clinical setting (community-acquired vs nosocomial or existence of any current epidemics), host factors (immunocompromised vs immunocompetent or existence of comorbidities), and the stage of disease. Imaging is used to detect or rule out suspected infection, differentiate it from other disease processes, assess disease severity and complications, and evaluate the response to treatment. Chest x-ray (CXR) is often the initial examination performed and remains the mainstay of imaging of lung infections. However, CXR is not specific in terms of disease etiology necessitating further diagnostic workup with computed tomography (CT). CT scan should be performed when there is a strong clinical suspicion of pneumonia that is accompanied by normal, ambiguous, or nonspecific radiography. CT readily shows the nature, location and distribution of disease as well as associated abnormalities such as lymphadenopathy, pleural effusion and/or empyema. It also guides bronchoalveolar lavage or a percutaneous or transbronchial lung biopsy. Imaging manifestations of pulmonary infections include alveolar consolidation, ground glass opacity, reticulation, nodules or cavitary lesions. Alveolar consolidation is seen in lobar or focal nonsegmental pneumonia (most common in community-acquired pneumonia [common microorganisms are S. pneumonia, Klebsiella pneumonia, S. aureus]) or bronchopneumonia or lobular pneumonia (common in nosocomial infection [common microorganisms are S. aureus, Gr (-) bacilli, H. influenza]). Ground glass opacity may either reflect early phase of consolidation or be a manifestation of interstitial pneumonia (the most common causes are viruses, M. pneumoniae, and P. jirovecii). In the latter, it may be associated with reticulation (septal thickening). Radiologic patterns are used as the primary method of classification of pulmonary infections, and can be useful in identifying the etiological organism in the appropriate clinical setting.

Learning Objectives
• To review the radiographic and CT features of lung infections
• To understand imaging manifestations of community acquired and nosocomial infections
• To discuss the role of imaging in the diagnosis and follow up of pulmonary infections
The acute bowel

S.M. Erturk, Istanbul/TR

Acute bowel is one of the reasons of acute abdomen that is a clinical condition characterized by severe abdominal pain. In such cases, the clinician has to evaluate therapeutic options including emergency surgery. Acute bowel includes conditions such as bowel obstruction, acute mesenteric ischemia, diverticulitis, and inflammatory bowel disease. Small bowel obstruction, in particular, may be caused by tumors, adhesions, internal hernias or can be due to a volvulus or intussusception. The main causes of large bowel obstruction are tumors, diverticulitis, sigmoid or cecal volvulus and Crohn disease. A correct diagnosis is critical to avoid delayed necessary treatment or unnecessary surgery. In general, supine and upright abdominal x-rays should be taken as the initial step. Distended bowel loops and fluid levels are typical of small bowel obstruction. Nevertheless, abdominal x-rays have a limited value in the evaluation of abdominal pain, in general. Sonography can be employed to assess the spot of maximum tenderness. Contrast enhanced CT has a higher diagnostic accuracy and can also be employed to exclude conditions such as acute mesenteric ischemia, diverticulitis, and inflammatory bowel disease. Since many conditions may cause symptoms resembling those of acute bowel, imaging modalities typically play complementary roles to each other.

Emergencies of non-gynecologic origin in the setting of pelvic pain

D. Akata, Hacettepe University Medical School Department of Radiology

There is a wide range of causes of acute pelvic pain. To be able to differentiate non-gynecologic emergencies from gynecologic origin has vital importance, since the management is different. Ultrasound (US) is the primary imaging modality of choice to evaluate pelvic pain in the female patient. Computed tomography (CT) is mostly performed if ultrasound findings are equivocal or if the abnormality extends beyond pelvis. Conditions such as appendicitis, diverticulitis, pyelonephritis and renal calculi may develop in women of childbearing age with clinical features that mimic obstetric and gynaecologic emergencies. Pelvic pain is a diagnostic problem especially in pregnant woman. Ultrasound scanning has certain limitations secondary to increasing gestational age. CT is not appropriate due to radiation dose. In those situations, it has been proven that magnetic resonance (MR) imaging is a valuable adjunct to delineate the pathology. In non-pregnant woman the radiological evaluation is less difficult. Still, a multimodality approach may be needed in certain cases. In this lecture, radiological features of non-gynaecologic emergencies such as acute appendicitis, diverticulitis, renal calculi, pyelonephritis, mesenteric cyst torsion and epiploic appendagitis will be discussed. Resembling and distinctive radiological features of pathologies of gynecologic and non-gynecologic origin will be revisited.

Emergencies in Oncologic Imaging

F. Berger, Department of Clinical Radiology, University of Munich, Munich/DE

Acute life-threatening conditions in oncology patients may develop either because of underlying malignancy or as a complication from treatment. Oncologic emergencies can be categorized as metabolic, hematologic, and structural conditions. Metabolic and hematologic emergencies are mainly diagnosed on the basis of clinical and laboratory findings. Structural pathologic conditions that result in bleeding, mechanical compression, or obstruction to the hollow organs, such as bowel loops, may first be suspected because of clinical findings, including decreasing hematocrit levels, difficulty in breathing, and
abdominal pain; however, performance of imaging studies is critical for timely diagnosis and management. Life-threatening conditions of the central nervous system (such as cerebral herniation), thoracic emergent conditions (such as massive hemoptysis, central airway obstruction, pulmonary embolism), and abdominopelvic emergencies (such as uncontrolled intraabdominal hemorrhage, bowel obstruction, intestinal perforation, bowel ischemia) can be definitively diagnosed on the basis of non-invasive imaging findings in appropriate clinical scenarios. Select emergent conditions in cancer patients related to chemotherapy, molecular targeted pharmacotherapy or radiation treatment, as well as iatrogenic emergencies secondary to either surgery or placement of foreign materials, may also demonstrate characteristic findings at imaging studies. We will provide an overview of key imaging findings with special focus on abdominopelvic oncological emergency situations but also beyond. Radiologists should be aware of these select, “not to be missed” imaging findings of oncologic emergencies to make an accurate, timely diagnosis and contribute to appropriate patient care.

The role of radiology in massive pelvic bleeding in trauma patients

W. Jaschke, Innsbruck/AT

Traumatic pelvic fractures can result in significant hemorrhage that can be associated with significant morbidity and mortality. Patients with pelvic fractures that cause hemodynamic instability have a mortality rate that exceeds 50% in several series. Thus, hemodynamic instability indicates a poor prognosis, especially if it persists for a longer time period. Bleeding from pelvic fractures can be generated from several sources including arterial and venous injury, and bleeding from fractured cancellous bone within the pelvis. Bleeding from fractured bone within the pelvis can be controlled with prompt stabilization of the fracture, which also can tamponade and control venous bleeding. However, arterial bleeding cannot be controlled using these measures. Although the risk of significant arterial hemorrhage after pelvic fracture is clear, the incidence and predictors for needing therapeutic arterial embolization remain in debate. Criteria exist for obtaining pelvic arterial angiography in patients with severe pelvic fracture based on the presence of hemodynamic instability or the need for ongoing blood transfusion. However, early therapy avoiding massive transfusions, prolonged hemodynamic instability and abdominal compartment syndrome would be desirable. Contrast enhanced MSCT during the arterial and venous phase provides important information allowing early indication for treatment. Predictors for massive arterial bleedings are: instable pelvic fracture with pelvic hematoma; contrast extravasation during MSCT in the arterial phase; drop of blood pressure and hemodynamic instability. Arterial embolization is indicated if arterial contrast extravasation caused by fractured bone is demonstrated on CT. In hemodynamically instable patients, treatment has to be performed on an emergency basis. Transarterial embolization (TAE) is highly effective (85-100%), repeat embolization to control hemorrhage has to be performed in less than 10%. The complication rate is low (4-8%). Stent grafts are very rarely indicated to control bleeding since most bleedings sites are located in the internal iliac territory. The common and external iliac artery are very rarely involved in pelvic trauma. If one of these arteries is lacerated, rapid control of bleeding by balloon tamponade and secondary repair (stentgraft, surgery) is frequently indicated.
References

Learning Objectives
1. To understand the CT findings in pelvic trauma
2. To discuss the indications and results of embolization and stent grafts in pelvic trauma
3. To discuss the complications of embolization in pelvic trauma

ER in Western, Middle and Eastern Europe: Cultural Clash or symbiotic drivers? What can we learn from each other?
R. Onur, Ankara/TR

Emergency radiology is an emerging subspecialty of radiology. Improvement of emerging subspecialties in radiology necessitates communication between radiology communities from different countries. Discussing experience of radiologists in meetings may contribute improvement of emergency radiology. In this lecture, radiologists from Western and Eastern Europe will present their experience in emergency radiology and they will emphasize the importance of communication between radiology communities to offer new horizons in emergency radiology.

What technicians want to know but seldom ask
R. Onur, Ankara/TR

Emergency radiology departments should use imaging techniques with appropriate parameters in order to obtain diagnostic imaging features in assessment of patients. For this purpose, collaboration between technician and radiologists is essential. Although technicians usually perform imaging examinations without any help from radiologists there may be some circumstances which necessitate consultation with radiologist about the technique of the examination including patient position, scanning area, dose of contrast material, contrast enhancement phase etc. In this presentation, we aim to summarize the conditions in which technicians may require radiologists' opinion about the technique of the imaging examination.

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