



# ESER

European Society of  
Emergency Radiology



# BSER

British Society of Emergency Radiology



# ESER/BSER ANNUAL SCIENTIFIC MEETING 2017

April 25-26, 2017 | London, UK

## Abstract Syllabus



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# SCIENTIFIC ABSTRACTS

# A META-ANALYSIS OF THE EFFICACY OF WHOLE-BODY COMPUTED TOMOGRAPHY IMAGING IN THE MANAGEMENT OF TRAUMA AND INJURY

4

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## Purpose

Traumatic injury is the third leading cause of death overall. To optimize the outcomes in these patients, hospitals employ whole-body computed tomography (WBCT) imaging due to the high diagnostic yield and potential to identify missed injuries. However, this delays time-critical interventions. Currently, there is an absence of any high-level evidence to support or refute either view. We present a meta-analysis of the available literature to elucidate the efficacy of WBCT in improving the outcomes of trauma, specifically the mortality rate.

## Methods and materials

A systematic review of studies comparing WBCT and selective CT imaging in secondary survey was conducted, using MEDLINE, EMBASE, the Cochrane Review and Scopus databases. The articles were evaluated for intervention using WBCT to reduce mortality rate, followed by subgroup analysis for other secondary measures, using Review Manager 5.3 software.

## Results

Eleven studies of 32,207 patients were included. There were lower overall (OR=0.79; 95% CI 0.74,0.83,  $p<0.05$ ) and 24-hour mortality rates (OR=0.72, 95% CI 0.66,0.79,  $p<0.05$ ) in the WBCT cohort. Additionally, patients in the WBCT arm spent less time in the emergency room (MD=-14.81; 95% CI -17.02, -12.60,  $p<0.00001$ ) and needing ventilation (MD=-2.01; 95% CI -2.41, -1.62,  $p<0.05$ ) despite a higher baseline injury severity score.

## Conclusion

The analysis shows that WBCT results better outcomes, including a lower overall and 24-hour mortality rate. Further work is required to make definitive clinical recommendations for a tailored algorithm in managing trauma patients.

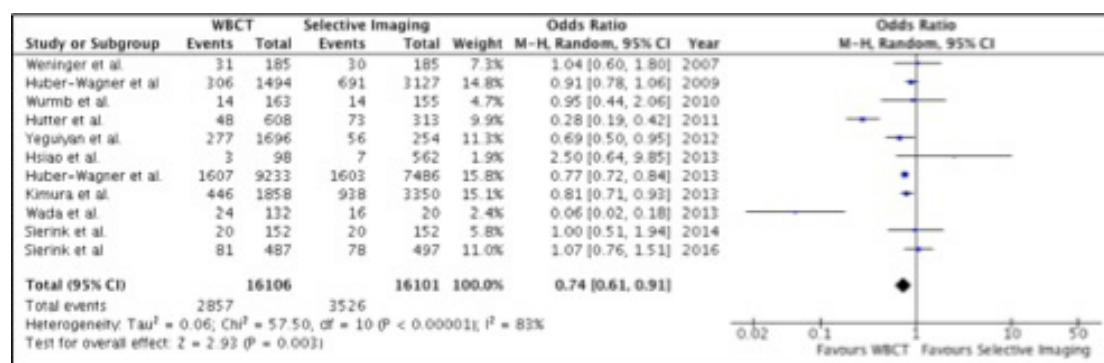


Figure 1: Overall mortality rate

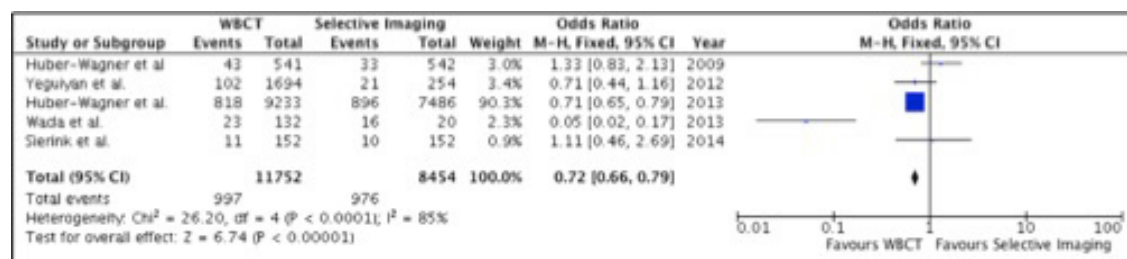


Figure 2: 24-hour mortality rate

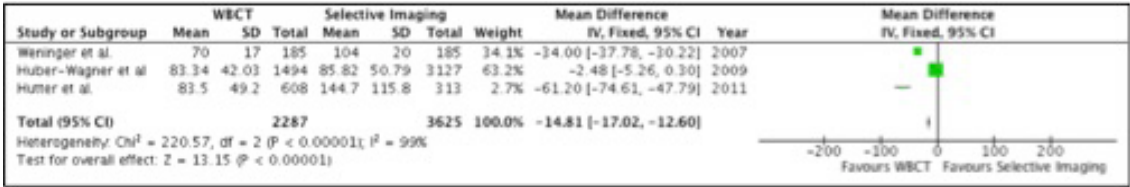


Figure 3: Time in the emergency room

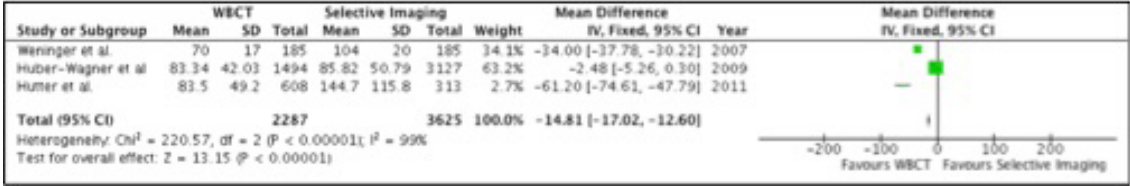


Figure 4: Number of ventilation days

# VALUE OF MDCT IN IDENTIFYING DIAGNOSTIC FINDINGS IN BLUNT BOWEL AND/OR MESENTERIC TRAUMA: OUR EXPERIENCE.

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*M.C. Firetto, A.A. Lemos, T. Canini, P. Biondetti; Milan/IT*

## Purpose

To compare CT findings to surgical findings in CT diagnosis of bowel/mesenteric blunt traumatic lesions in our series of patients

## Methods and materials

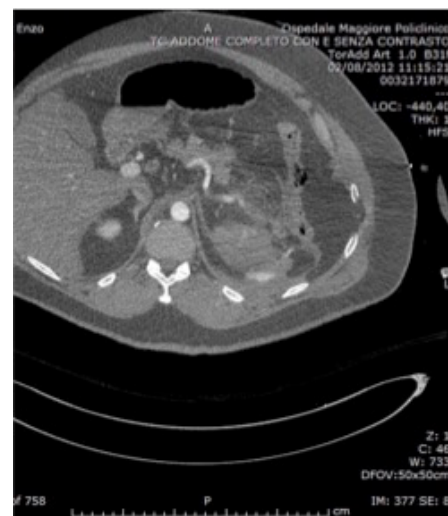
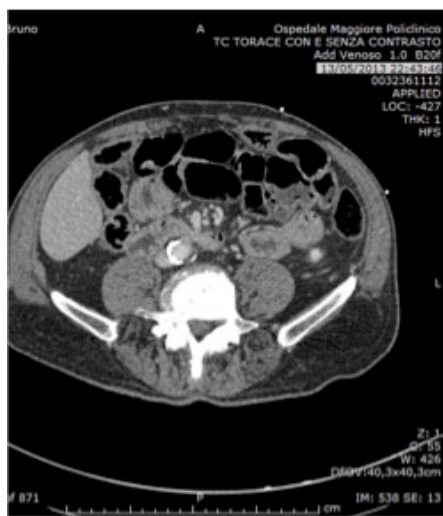
From January 2010 to March 2015, 324 consecutive multi-system trauma patients with ISS >16, who underwent whole body MDCT, were retrospectively evaluated. Reference standards were surgical findings, clinical follow-up and discharge diagnosis

## Results

14/324 patients had bowel and/or mesenteric injuries, mentioned in the radiology report (all male, mean age 39.6, range 18-70y old). 9/14 patients had laparotomy after CT. 5/14 patients did not have laparotomy: in this group of patients, CT findings were: extraluminal air (n=2), intramural air (n=1), bowel wall thickening (n=2), abnormal bowel wall enhancement (n=1), mesenteric infiltration/stranding (n=2), intra/retroperitoneal free fluid (n=1). No bowel discontinuity, extraluminal contrast extravasation or active bleeding were observed. 3 patients had concomitant solid organ injuries. In the group of 9 patients who underwent laparotomy, CT findings were as follows: bowel discontinuity (n=3), extra luminal air (n=4), bowel wall thickening (n=4), abnormal bowel wall enhancement (n=3), mesenteric infiltration/stranding (n=4), active bleeding (n=4), free fluid (n=9). No extraluminal contrast extravasation and intramural air were observed. 4 patients had concomitant solid organ injuries

## Conclusion

Active bleeding and bowel discontinuity are surgically proven predictors of unsuccessful conservative management, in agreement with literature. Free fluid is an indicator of possible underlying bowel/mesenteric injury, in agreement with literature. The significance of intramural air is controversial.





# INCREASED RISK OF VASCULAR INJURY WITH ISOLATED OCCIPITAL CONDYLE FRACTURES FOLLOWING BLUNT CRANIOCERVICAL INJURY: A LEVEL 1 TRAUMA CENTRE EXPERIENCE <sup>7</sup>

*T. Campion, J. Siddiqui, A. Adams; London/UK*

## **Purpose**

Occipital condyle fractures in the context of blunt craniocervical injury often indicate a high-energy trauma and as such may carry a risk of associated vascular injury; however, institutional protocols vary as to whether CT angiography (CTA) is indicated if these fractures are identified in isolation. We performed a retrospective audit to determine the incidence of vascular injury in such cases.

## **Methods and materials**

A RIS search was performed to identify patients with occipital condyle fractures from December 2014 - January 2017. Patients with fractures secondary to blunt trauma were included. The type of occipital condyle fracture, any associated craniocervical injuries on CT head or cervical spine (which would be indications for CTA), whether CTA was recommended and/or performed, and subsequent management were recorded.

## **Results**

72 patients with occipital condyle fractures were identified, of whom 24 had no other indication for CTA. These included 1 patient with a type 1 fracture, 8 patients with a type 2 fracture and 15 patients with type 3 fractures. CTA was performed in 9/24 (38%). Vascular injury was identified in 4/24 (17%). Of note, vascular injury was only identified in patients with type 3 (avulsion) occipital condyle fractures (4/15, 27%).

## **Conclusion**

Although in a relatively small sample, our results suggest that there may be an association between isolated type 3 occipital condyle fractures and vascular injury, and as such CTA may be of value in this patient cohort. Larger series are required to fully elucidate the role of CTA in occipital condyle fractures.

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## Purpose

To evaluate feasibility, safety, efficacy of bronchial artery embolization (BAE) in our single-center experience.

## Methods and materials

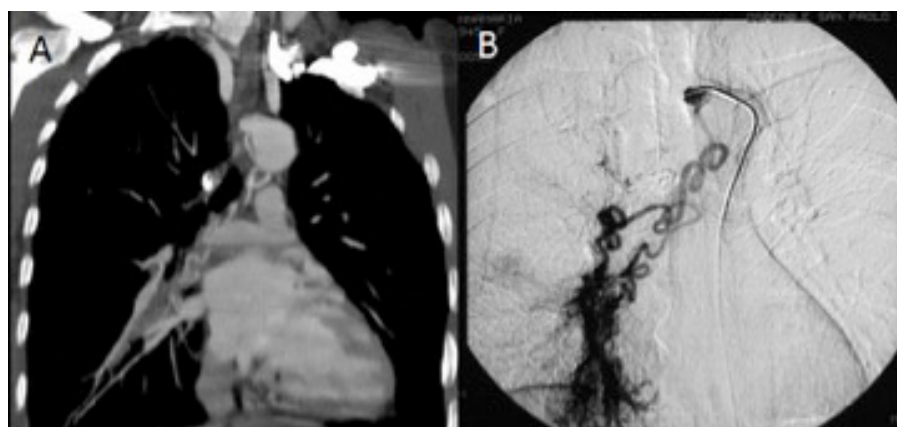
From 2001 to 2016, 90 patients (59 males, 31 females; median age:59 years), with moderate-severe hemoptysis underwent BAE (28 due to bronchiectasis, 41 due to other known causes, 21 with unknown causes). Artery features and embolization agents were reported. Efficacy was evaluated at 24 and 48 hours after BAE and again after 1 month. All complications were recorded.

## Results

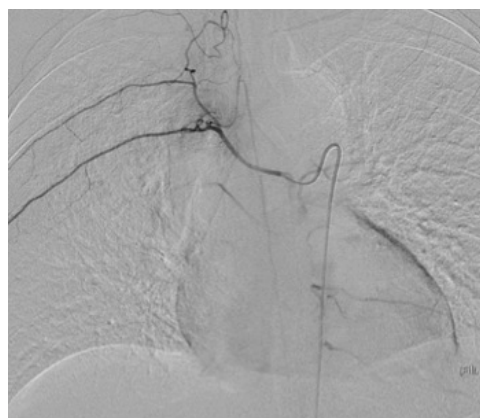
Bleeding was bilateral in 9 patients, unilateral in 81 cases (57 right, 24 left). 71 patients (78.9%) had bleeding from orthotopic bronchial arteries, 19 patients (21.1%) had bleeding from ectopic bronchial arteries or from non-bronchial systemic arteries. Diagnostic angiography showed hypertrophy of the bleeding artery in 54 cases; in the other cases anomalous shunts (16 times), scattered hypervascularization (16 times) and arterial blushing (13 times) were observed. Polyvinyl alcohol (PVA) embolization alone was performed in 81 patients. Coil embolization alone was performed in only 1 patient. Both PVA and coils were released in 8 patients. Hemoptysis resolution was observed in 75 patients (83.3%) after 24 hours and in 87 patients (96.7%) after 48 hours. No further treatments were necessary for the 3 patients non-responsive to BAE within 48 hours. No major complications were observed, in particular no medullary ischemia/other neurological complications. 13 patients (14.4%) developed temporary chest pain and 4 patients (4.4%) temporary dysphagia. Hemoptysis relapse was observed in 19 patients (21.1%) after 1 month.

## Conclusion

BAE is a feasible, safe, effective procedure to treat patients with moderate-severe hemoptysis.

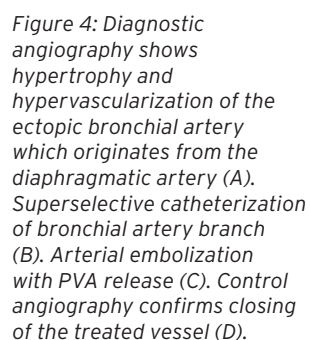
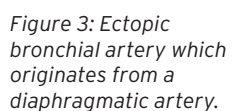


*Figure 1: MIP reconstruction in CT coronal image (A) and angiographic imaging of hypertrophic right bronchial artery (B).*



*Figure 2: Diagnostic angiography shows intercostal artery from which a medullary branch originated: note the typical hairpin shaped morphology of the medullary artery.*





*S. Zaman , P. Logan, S. Harave, C Landes; Department 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 purpose of this study was to determine whether this is justified. Further aims were to determine whether there was any justification for performing CT head examination for children with soft tissue injuries measuring less than 5cm, or for 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 who subsequently underwent head CT were retrospectively identified from radiology requests. The CT scans and clinical notes were used to identify those with skull fracture or intracranial haemorrhage and to determine whether the child was subsequently admitted or discharged from Accident and Emergency.

## **Results**

85 CT head examinations met the criteria for inclusion. Of these, 45 examinations demonstrated skull fractures and 4 examinations identified intracranial haemorrhage. 38 requests included soft tissue evidence of head injury as the sole reason indicated for CT head examination. Of these, 22 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.

# CORRELATION BETWEEN MULTI DETECTOR COMPUTED TOMOGRAPHY FINDINGS AND MANAGEMENT OF BLUNT SPLENIC INJURIES IN MULTYTRAUMA PATIENTS

11

*F. Ruschi, M. Tonerini; Pisa/IT*

## **Purpose**

To correlate in terms of sensitivity, specificity, positive/negative predictive values and diagnostic accuracy the Multi Detector Computed Tomography (MDCT) findings, ranked according to the Baltimore Grading System, with the management of blunt splenic injuries in multytrauma patients.

## **Methods and materials**

36 trauma patients were admitted to the Emergency Department and underwent a contrast-enhanced MDCT (using a 64 slices CT) with diagnosis of blunt splenic injury (study group). MDCT results were collected retrospectively and then ranked according to the Baltimore Grading System criteria.

## **Results**

The MDCT findings were categorized as true positive, true negative, false positive or false negative to determine the sensitivity, specificity, positive and negative predictive value and accuracy of MDCT in suggesting the management of patients. The MDCT findings had an overall sensitivity of 92.30%, specificity of 91.30%, positive predictive value of 85.71%, negative predictive value of 95.45% and diagnostic accuracy of 91.66%. Of all the hemodynamically stable patients at admission to the Emergency Radiology (33 of 36 patients), 30 patients (91%) had a successful nonoperative management (NOM). Only in 3 patients (9%) NOM failed, leading to splenectomy, because of respectively post-embolization splenic abscess, post- embolization splenic rupture, and inability to catheterize the splenic artery.

## **Conclusion**

The Baltimore Grading System of Blunt Splenic Injuries shows high sensitivity, specificity, negative predictive value and diagnostic accuracy in predicting the management of patients. In agreement with the literature data, our experience confirms that NOM of blunt splenic injuries is the standard of care in patients who are hemodynamically stable at admission to the Emergency Radiology.

# WHEN TO INTERVENE WITH THE SPLEEN IN BLUNT TRAUMA: 5 YEAR EXPERIENCE IN A TRAUMA CENTRE

12

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## Purpose

Management decisions for traumatic splenic injuries remain variable. This study evaluates the morbidity and mortality of splenic injury according to treatment (surgery, splenic artery embolization (SAE) and non-operative management (NOM)) and aims to define optimal selection criteria for appropriate management.

## Methods and materials

Retrospective study at a Level I trauma centre(2010-2015). Patients with splenic trauma were identified from the National Trauma Audit and Research Network (TARN) and the hospital coding department. Management and morbidity were recorded. Cross-sectional imaging was reviewed by 4 IR Consultants to assess inter-observer variability in management decision based on imaging findings and haemodynamic status.

## Results

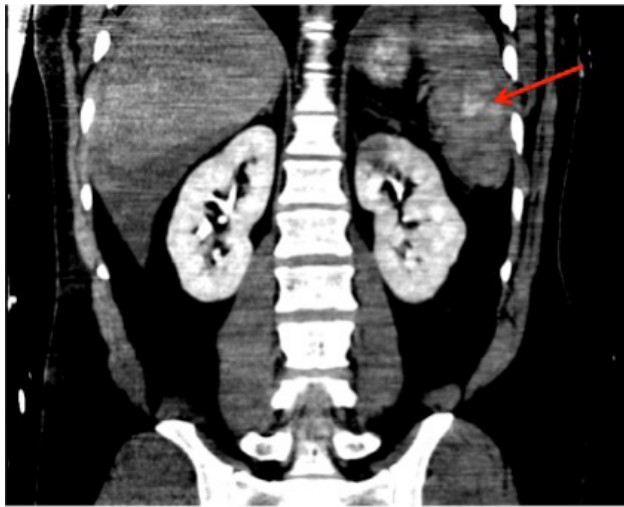
Total of 112 patients (81 male:31 female). 10%(11) had surgical splenectomy, 20%(22) had SAE and 70%(79) had NOM. SAE group: 23%(5) patients had proximal embolisation for splenic laceration and haemodynamic instability. 77%(17) had distal embolization (for active bleeding). 1 patient had delayed splenectomy for haemodynamic instability post embolization and 3 failed NOM and required SAE; no other complications observed. All proximal SAE patients were commenced on prophylactic pneumococcal vaccination. 108(96%) patients had cross-sectional imaging at presentation. Regarding CT signs, the 4 vascular consultants were in most agreement on the presence of active bleeding (89%), Fleiss' Kappa 0.696. For method of treatment, inter-observer agreement was 84% (range 83-93%)and Fleiss' Kappa was 0.614.

## Conclusion

In the presence of splenic laceration and active bleeding on initial cross sectional imaging, SAE was preferred over surgical and NOM. Selective SAE is favoured and has good outcomes, with low complication rate. Conservative management has a high success rate for low-grade injury.



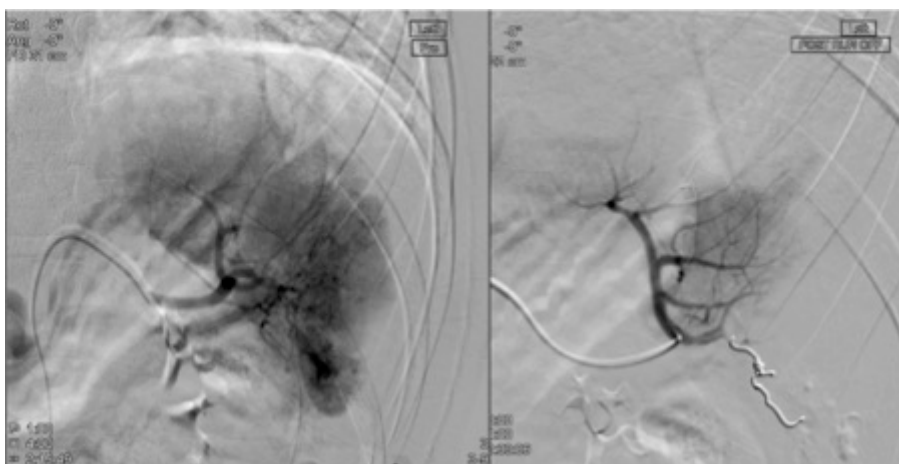
Figure 1: Contrast enhanced CT (portal venous phase) showing splenic laceration and perisplenic haematoma.



*Figure 2: Contrast enhanced CT showing contrast extravasation within the spleen at the site of splenic laceration indicating active bleeding.*



*Figure 3: Catheter angiogram of splenic artery following blunt trauma showing a 'Seurat' spleen with multiple small punctate regions of intra-parenchymal contrast extravasation indicating active bleeding.*



*Figure 4: Catheter angiogram of splenic artery showing selective embolization of the injured lower pole of the spleen (pseudoaneurysms and extravasation of contrast seen on the left image).*

# SHOULD CT GUIDED TRACTOGRAPHY TAKE PLACE IN THE GUIDELINE OF THE MANAGEMENT OF THE PENETRATING ABDOMINAL TRAUMA?

14

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## **Purpose**

In spite of the numerous research published focusing on the penetrating abdominal trauma and the presence of the trauma guidelines, the surgical approach to the penetrating abdominal trauma patients is still under debate. Computed tomography guided tractography (CTT) is an imaging modality in which water soluble iodinated contrast medium is administered via Foley catheter to the site of injury in the CT unit. The aim of this study was to find out the diagnostic accuracy of the CTT.

## **Methods and materials**

Penetrating abdominal trauma patients who admitted to the emergency department and underwent CTT were retrospectively evaluated taking into account the reports of ultrasonography (US), contrast enhanced abdominal CT, CTT, surgery and clinical results.

## **Results**

A total of 101 patients, 12 women (11,9%) and 89 men (88,1%) were evaluated. US procedures showed 0,474 sensitivity, 0,929 specificity and 0,667 accuracy. CT procedures demonstrated 0,549 sensitivity, 0,933 specificity and 0,663 accuracy. CTT revealed 0,928 sensitivity, 0,906 specificity, 0,921 accuracy, 0,955 positive predictive value and 0,855 negative predictive value. In 24 patients (23,8%) whom CTT indicated passage through the peritoneum, paranchymal organ injury was not present. There was not any procedure related morbidities.

## **Conclusion**

CTT is a safe imaging modality for the evaluation of the hemodynamically stabile patients. It is superior to demonstrate whether peritoneum is intact compared to the other imaging modalities, therefore should take place in the guidelines. It is beneficial to corralete the results with other imaging modalities to diagnose the parenchymal injuries and to determine the treatment approach.



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## **Purpose**

To explore the role of dual-phase CT in the assessment of traumatic vascular injuries of liver and spleen, comparing the prevalence of parenchymal contusion, contained vascular injuries or active bleeding between arterial and portal venous phase.

## **Methods and materials**

Dual-phase CT examinations of 71 patients diagnosed with vascular injuries of liver and spleen, performed between January 2012 and December 2016 were retrospectively reviewed. For each examination, arterial and portal venous phase were compared in the identification of active bleeding, pseudo-aneurisms (PSA) and arteriovenous fistulas (AVF).

## **Results**

Of 71 patients, 49 (69%) had active bleeding, 34 of them (69.4%) from spleen injury and 15 (30.6%) from hepatic injury, and 22 (31%) had contained vascular injuries, 15 of them of the spleen (68.2%) and 7 (31.8%) of the liver. In 15/49 patients with active bleeding (30.6%), the arterial phase was crucial to correctly identify the arterial origin of the bleeding. In 13/22 of patients with contained vascular injuries (59%), the detection of vascular injury was possible only in the arterial phase.

## **Conclusion**

Dual-phase CT examinations increases the possibility, in the arterial phase, to detect contained arterial injuries, whereas the venous phase is essential to identify the venous vascular injuries, to differentiate contained vascular injuries from active bleeding and to evaluate the entity of the bleeding. Dual-phase protocol is recommended allowing an accurate identification and characterization of traumatic vascular injuries and an adequate distinction between the injuries that may be conservatively treated and those requiring interventional treatment or vascular surgery.

# EMERGENCY MDCT ANGIOGRAPHY IN TRAUMATIC ARTERIAL INJURIES OF THE EXTREMITIES

16

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*Presenter: D. Berritto, Acerra/IT*

## **Purpose**

To retrospectively assess the accuracy of MDCT angiography as the initial diagnostic technique to depict arterial injury in patients with extremity trauma.

## **Methods and materials**

Over 40 months, 95 patients (16-87 yy) with clinically suspected arterial injury after extremity trauma underwent 64/128MDCT angiography and 80 ultimately underwent surgery or interventional radiology treatment. 67 pts had blunt injuries, and 28 had penetrating injuries. Each detected arterial lesion was then characterized as a spasm, stenosis, occlusion, pseudoaneurysm or rupture. 2 CT experienced radiologists performed separately images evaluation.

The standard of reference was surgery (54 pts) or angiography (26 pts); clinical and radiologic follow-up was used in 15 pts. Image quality, lesion depiction, and artefacts were assessed.

## **Results**

72 traumatic arterial lesions were confirmed. MDCT showed sensitivity and specificity 95% and 87%, respectively, in vascular lesion depiction. Image quality and lesion depiction on MDCT angiograms were considered good and artefacts were considered mild with substantial interobserver agreement

## **Conclusion**

MDCT angiography provides significant and reproducible technique for detection and characterization of arterial injuries to the extremities with high image quality and vascular delineation.

*C. Liguori, Naples/IT; A. Pinto, Naples/IT; G.L. Ponticiello, Naples/IT; C. Stavolo, Naples/IT; S. Nicotra, Naples/IT; L. Romano, Naples/IT;  
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*Presenter: D. Berritto, Acerra/IT*

## **Purpose**

To investigate how accurately MDCT can diagnose the level of upper GI tract perforation especially assessing site and entity of esophageal leakages.

## **Methods and materials**

MDCT studies in 60 patients with surgically confirmed esophageal perforation were retrospectively evaluated. Examinations were performed using 64 and 128 MDCT; submillimetre axial images and multiplanar reconstruction (MPR) images were generated for all patients. Intravenous contrast enhancement was performed in all patients and in 35 oral contrast was also administered. Two experienced radiologists reviewed the images for direct findings (free air, ruptured esophageal wall, oral contrast leak) and indirect findings (inflammatory changes, fluid collection, focal thickening of the GI tract wall) and attempted to identify the perforation site in each patient.

## **Results**

Free air was seen in more than 95% of the patients with perforation at sites; rupture of the esophageal wall was directly visualized in 32%; oral contrast leakage was appreciated in 90%.

Indirect signs: wall thickening and periesophageal inflammatory changes were present in 95% of cases, fluid collections in 87%. The perforation site was correctly diagnosed in 90% of the patients when the radiologists referred to both direct and indirect findings.

## **Conclusion**

MDCT is a robust technique for esophageal perforation identification. Intravenous contrast and oral contrast administration are key factors for a confident diagnosis.

# OVERUSE OF HEAD CT EXAMINATIONS FOR THE INVESTIGATION OF MINOR HEAD TRAUMA: ANALYSIS OF CONTRIBUTING FACTORS

*C. Floridi, M. Cellina, M. Orsi, G. Clesceri, V. Di Candido, G. Oliva; Radiology Department, Fatebenefratelli Hospital, Piazza Clorilde 26, 21126 Milano, Italy*

## **Purpose**

The aim of this study was to estimate the amount of CT studies performed in an emergency department that are not indicated by Canadian CT Head Rule (CCHR) guidelines and to analyze factors that contribute to unnecessary examinations.

## **Methods and materials**

A total of 915 brain CT examinations performed for minor head injuries were retrospectively analyzed. Medical records were assessed for the following parameters: demographics, cause of head trauma, and referring physician's seniority and specialty. For each CT scan, it was determined whether the CT referral met the CCHR criteria. The CT interpretations of patients under 65 years of age were evaluated to assess the sensitivity and negative predictive value of the CCHR criteria.

## **Results**

A total of 104 examinations (11.3%) were not indicated according to the CCHR, but in patients younger than 65 years, 103 of 279 examinations (36.9%) were not indicated. Neurologists conducted more unwarranted CT studies, whereas surgeons tended to order fewer studies. There was no statistically significant difference between the seniority of the referring physician and over-referral. A hit on the head by an object were associated with a higher rate of nonindicated CT examinations. The CCHR had sensitivity and negative predictive value of 100% for either brain hemorrhage or fractures.

## **Conclusion**

Overuse of CT examinations for minor head injuries was demonstrated, especially in young patients, with an excess of 36.9%. Contributing factors are referring physician specialty and injury mechanism. Analysis of overuse causes can be implemented for education programs and for computerized referring protocols.

## INVITED ABSTRACTS

## SHOCK AND BLEEDING

*E. Dick, London/UK; A. Blanco Barrio, Murcia/ES*

### Learning Objectives:

1. Recognise signs of acute shock in traumatic and non-traumatic settings
2. Be able to search for active bleeding
3. Understand how fractures cause haemodynamic compromise even without active bleeding
4. Be able to communicate important features of shock and bleeding to the trauma team

## THE PATIENT EXPERIENCE: SURVIVING A POLYTRAUMA

*A. Drought, London/UK*

Alexandra was involved in a road traffic accident in 2014, when she and her boyfriend were hit as cyclists by a car driver who fell asleep at the wheel at 4 pm. They both suffered multiple injuries and were admitted to hospital as 'polytrauma' patients. Alexandra will give a brief overview of their injuries, her experiences as a patient, but through the eyes of a healthcare professional and what life was like once she returned home and eventually back to her place of work.

## EMERGENCY CT HEAD

*N. Khandelwal, Chandigarh/IN*

### Learning Objectives:

1. Recognise the indications of CT head in emergency settings
2. Identify the types of hemorrhages and associated bony/soft tissue injuries in the setting of acute trauma
3. Understand the parenchymal and vascular features in non-traumatic intracranial hemorrhages with special reference to hemorrhagic and ischemic stroke
4. Detect the parenchymal and meningeal changes associated with acute febrile encephalopathy, status epilepticus and other acute neurological presentations in the ER

## TRAUMA ON THE FRONTLINE- EXPERIENCE IN THE WORLD'S WAR AND DISASTER ZONES.

*Surg Cdr J. Keogh, UK*

### Learning Objectives:

1. Understand the injuries sustained from exposure to explosions and from high velocity gunshot wounds
2. Recognise the importance of effective team-working
3. Understand how key lessons may be transferred into civilian practice



## CARDIAC CT IN THE EMERGENCY SETTING.

*P. McParland, London/UK*

### Learning Objectives:

1. Give an overview of cardiac CT techniques.
2. Recognise the clinically significant findings on cardiac CT.
3. Present the evidence for the use of cardiac CT in the emergency setting.
4. Explain CT FFR and its possible future use in the emergency setting.

## CERVICAL SPINE TRAUMA-CT

*D. Varma, Melbourne/AU*

### Learning Objectives:

1. Understand the anatomy of the cervical spine and the cranio-cervical junction
2. Review the evidence behind imaging of cervical spine
3. Grading of cord injuries
4. Review the new evidence regarding blunt cerebrovascular imaging
5. Review the Modified Denver Criteria for BCVI
6. Be able to communicate important features of cervical spine trauma and appropriate utilization of imaging

## ABCDE PAN EUROPE

*S. Wirth, Munich/DE*

Polytrauma remains a leading cause of death and disability worldwide, especially in the age group below 40 years. As time is particular related to outcome, diagnoses have to be provided clearly within the golden hour and also important interventions or surgical treatment should at least have been begun within this time span.

Wide availability, fast and exact diagnosis as well as increased survival have established whole-body CT as the key modality for initial diagnostic polytrauma service. However, the large amount of whole-body CT images requires solutions to ensure efficient and timely interpretation as well as immediate distribution of the report and the images.

Trained staff, optimised and standardised processes as well as fundamental knowledge of key injuries that require urgent treatment are indisputable prerequisites. Important, typical image findings of very high acute relevance are: active haemorrhage, non-stable fractures of the spine, sternum and pelvis, pneumothorax, heart, aortic and major vessel injuries, bronchial ruptures, laceration of lung, liver, spleen or kidneys, pancreatic injury with ductal involvement, diaphragmatic or intestinal rupture.

Guided by cases we will together learn how to view, report and interpret in a standardized fashion according to the ABCDE scheme, i.e. (Airway, Breathing, Circulation, Disability, and Environment).

### Learning Objectives:

1. To learn polytrauma background information
2. To understand how ABCDE offers scaffolding safety for viewing, reporting and interpretation of emergent trauma cases
3. To learn how to use ABCDE for these kind of cases
4. To apply these knowledge and skills to cases

## POST-MORTEM IMAGING – THE EVOLVING ROLE OF CT IN FORENSIC, MILITARY AND SUDDEN DEATH IMAGING

*I. Gibb, Portsmouth/UK*

### Learning Objectives:

1. Understanding the use of imaging, particularly CT, in post-mortem imaging
2. Review of CT PM techniques
3. Understanding use of CT PM in trauma, ballistic and blast deaths with reference to mass casualty terrorist atrocities
4. Recognising some pitfalls and lessons learned in CT PM
5. Understanding the utility and limitations of CT in sudden death

## MASS CASUALTY INCIDENTS (MCI) – PREPARE YOURSELF, KILLING SPREE MUNICH 2016

*F. Mück, Munich/DE*

Although Mass casualty incidents (MCI) are still rare events, the threat of terrorism is further increasing. Therefore radiologists as members of the emergency room team have to be prepared.

This lecture focusses on case reports from the killing spree of Munich 2016 as examples for gunshot wounds. Furthermore this will include a brief overview about additional MCI service challenges problems like mass panic, insufficient local public transportation and lacks of safety. A special focus is given to immediate post mortal imaging.

### Learning Objectives:

1. To understand MCI background in Europe
2. To learn interpretation of typical gunshot wounds
3. To learn key MCI side challenges
4. To develop the attitude to prepare your institution for MCI events

## PREPARING FOR MASS TERROR ATTACKS, THE BRUSSELS BOMBINGS MARCH 22 2016

*K. Nieboer, Brussels/BE*

The morning of March 22, 2016, three coordinated suicide bombings occurred in Belgium: two at Brussels Airport in Zaventem and one at Maalbeek metro station in central Brussels.

Thirty-two civilians and three perpetrators were killed, and 324 people were injured (65 T1, 68 T2, 115 T3 and 76 without field triage). Patients were evacuated to 27 different hospitals, secondary evacuation was organized to 24 other hospitals all over Belgium. During this session, we will review the organization of the UZ Brussel radiology department in case of a mass casualty. Representative cases will be discussed.

## WORKSHOP: ON CALL CT RAPID REPORTING; TEST YOUR SELF

*G. Antoniadou, Hull/UK*

### Learning Objectives:

Recognise a spectrum of common and less common but life-threatening/important pathologies on acute body cross-sectional imaging. Cases that you could encounter during the on-call work.

## WORKSHOP: ACUTE MRI BRAIN AND SPINE (ALL LEVEL)

*K. Katulska, Poznan/PL*

*Presenter: A. Gontsarova, London/UK*

### Learning Objectives:

1. To learn which patients are the best candidates for posttraumatic MRI
2. To be familiar with standard and short MRI examination protocols.
3. To understand the impact of MR findings in brain and spine trauma.
4. To recognize pathology and be familiar in findings in routine exams of brain and spine trauma.

## WORKSHOP: ACUTE ABDOMEN

*R. Basilico, Chieti/IT*

### Learning Objectives:

1. To be able to recognize common and unusual findings in acute abdominal disorders
2. To be familiar with the main differential diagnoses in acute abdomen, with reference to the site of pain
3. To be familiar with general signs of disorders causing acute abdomen

## WORKSHOP: ACUTE ABDOMEN IN THE FEMALE – WHERE MRI ADDS VALUE

*N. Bharwani, London/UK, W. Gedroyc, London/UK*

### Learning Objectives:

Following this interactive, Osirix-based, workshop delegates will be able to:

1. Identify situations where MRI can act as a problem-solving tool in the acute female pelvis e.g. pelvic inflammatory disease, acute abdominal pain in pregnancy with a normal ultrasound examination, complex post-partum patient
2. Counsel and consent pregnant females for MRI investigations
3. Discuss the current recommendations around the use of IV contrast agents in the postpartum period
4. Understand the rationale behind the MRI protocols used in pregnancy

## WORKSHOP: PAEDIATRIC SESSION

*N. Ahmadi, Amsterdam/NL; A.M. Deganello, London/UK; C. Landes, Liverpool/UK*

The accurate and rapid diagnosis of acute conditions in young children can be very challenging.

Due to the small volume of the body, sonography is in most of the paediatric cases the first modality of choice in all parts of the body (with exception of head and spine trauma), but it is not always conclusive and additional tests may be required.

CT scan is the best diagnostic tool in evaluation of post traumatic injuries, especially in head and spine trauma, in all ages. It is avoided in the diagnosis of acute abdomen in very young children, not only due to the ionizing radiation, but due to lack of contrast between the abdominal organs the right diagnosis could be almost impossible.

MRI is recommended in case of inconclusive diagnosis of appendicitis with sonography, abdominal inflammation and abscess, and acute abdomen in pregnancy.

In the paediatric workshop we will shortly go through some of the common paediatric pathologies and give a couple of examples of less common but life threatening conditions.

## WORKSHOP: ITU CHEST IMAGING

*M.E. Roddie, London/UK*

### **Learning Objectives:**

An interactive workshop of ITU chest radiographs available for review on workstations aiming to educate the participant about common thoracic lines and devices.

1. Recognise complications related to:
  - a. Central venous line placement
  - b. Cardiac devices
  - c. Endotracheal tubes
  - d. Nasogastric tubes
2. Understand which complications require urgent communicate to the ITU physicians

*Abstracts/Presentations appear as submitted and have not been checked for correctness and completeness. Subject to changes, printing and typesetting errors.*



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