Case report: An open book fracture of the pubic symphysis demonstrated by multi-slice computed tomography (MSCT)

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Abstract
This case report describes an open book fracture of the pubic symphysis with an accompanying large pelvic haematoma, diagnosed in a young male following a motorcycle accident. His clinical history, radiological findings as well as treatment are discussed.

Keywords
Haematoma, embolisation, active haemorrhage.

Case report
A young male involved in a motorcycle accident was admitted to a private hospital for trauma management. He had no medical history of note. He required ventilation, inotropic support and blood transfusions. He was then referred for a full body scan.

A CT scan of his brain, cervical spine, chest, abdomen and pelvis was performed. The chest, abdomen and pelvis protocol allowed for his chest to be scanned in an arterial phase utilizing bolus tracking and the abdomen and pelvis in the venous phase. The slice thickness for the primary data was acquired using 5mm slice widths and the secondary data were reconstructed at 1.25mm. Due to patient movement the acquired images were suboptimal and the secondary data were reconstructed at 1.25mm. Due to patient movement the acquired images were suboptimal but the scan revealed that there were no definite liver or pancreatic parenchymal injuries with both kidneys enhancing uniformly.

The CT findings (Figures 1-4) demonstrated an un-displaced base of skull fracture of the left temporal bone and left middle cranial fossa; a subarachnoid haemorrhage with blood in the gyri and sulci was present. There was excessive haemorrhage with blood in the gyri and left middle cranial fossa; a subarachnoid fracture of the left temporal bone and an un-displaced base of skull fracture was present.

An open book fracture was seen at the pubic symphysis (Figure 1 and 4). Active haemorrhage was present in the right adnexal area with a large haematoma displacing the bladder in a superolateral direction (Figure 2 and 3). Some haemorrhage was noted in the mesenteric root. Oedema in the anterior abdominal wall was also identified (Figure 3).

The patient underwent bilateral iliac artery embolisation where occlusion of the medial sacral branches was achieved. He then had a voiding cystouretrograde (VCU) procedure to demonstrate his mic-turating abilities. An anterior plate was surgically inserted to stabilize the open book fracture.

Discussion
An open book fracture of the pubis symphysis can be described as an anterior force that causes a disruption of the pubic symphysis. Separation of the pubic symphysis greater than 1cm is considered abnormal. The force causes each hemipelvis to externally rotate. Fixation of the open book fracture depends on the stability of the patient and displacement of the fracture. Internal fixation with anterior plating and screws is often performed when there is an open book fracture however the patient should be haemodynamically stable.

Pelvic fractures can lead to death. However, the fractures are not the primary cause as related injuries can cause further complications. Pelvic trauma has a high mortality rate and with the use of multi slice computed tomography (MSCT), fractures, vascular and organ injuries can be identified with ease. Compared to plain-film radiography MSCT has a higher sensitivity to detect abnormalities. Pelvic fractures are often accompanied by haemorrhaging. With open book fractures the sacroiliac joint is supported by posterior ligaments and opens like a hinge. Open book fractures require the highest number of blood transfusions. Pelvic fractures lead to extensive bleeding; the retroperitoneum is capable of holding 4 litres of blood.

Embolisation of arterial haemorrhaging caused by pelvic fractures is advisable even in unstable patients as death and organ failure can be avoided. Transcatheter arterial embolisation (TAE) in relation to haemorrhage control and reduced transfusions has proven successful in 85%-100% of the patients it is performed on and should be performed as soon as possible to prevent morbidity or mortality.
MSCT has proven useful in unstable and uncooperative patients with blunt abdominal trauma\textsuperscript{[5]}. Despite several movement artifacts on this patient’s CT images a diagnosis was possible. A full body scan is preferable in unresponsive patients. MSCT is fast and allows movement artifacts to be avoided in stable patients. MSCT has the ability to scan large areas with a narrow slice thickness and perform multiphase contrast examinations. Optimal scanning parameters must be applied to avoid high radiation doses\textsuperscript{[7]}.

Pelvic trauma is common and can be graded by using classifications according to the mechanism of the trauma and if there is a fracture present. MSCT can identify the location and extent of the bleeding
and provide soft tissue and bone detail in a single scan. Post-processing techniques, such as 3D volume rendered imaging, provide detail regarding the extent of the fracture and aid the surgeons. Sagittal and coronal post processing of the axial imaging provides data in different planes[6-8].

The use of biphasic scanning makes distinguishing between arterial and venous haemorrhaging possible; embolization of affected vessels should then be performed. This therapeutic method provides occlusion of the blood vessel to stop active haemorrhaging[9].

Extravasated contrast media can be distinguished from clotted blood by measuring the CT attenuation. Clotted blood has a CT attenuation range between 40 and 70 HU with an average of 51 HU[9]. Active haemorrhaging on MSCT has a higher attenuation. With the use of MSCT the location of the contrast material extravasations should closely correspond with the site of bleeding making interventional radiography more successful[10].

Conclusion
MSCT is a useful tool to diagnose pelvic trauma with the use of contrast media. The 3D multiplanar reconstructions provide vascular and bony detail[9]. MSCT has made diagnosis and further management of patients more successful. Embolisation of the affected vessels must be treated as a priority to surgical repair the fracture site[9].

References

peer reviewed CASE REPORT

Case report: Testicular germ cell tumour in a young male

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Abstract
This case report covers a patient with a metastatic non-seminomatous testicular germ cell tumour which manifested after trauma to the testicle. Radiology findings, epidemiology of the disease and patient management are discussed.

Keywords
Orchidectomy, retroperitoneal lymph node dissection, tumour markers, nodal mass.

Case report
A young male patient in his early twenties presented with a swollen left testicle at an academic state hospital. He reported that he had knocked his testicles a few months earlier and that his left testicle started swelling and became painful. He was subsequently diagnosed with non-seminomatous testicular germ cell tumour. A computed tomography (CT) scan one month later revealed an abdominal mass which was an indication of metastases. He was placed on four cycles of bleomycin, etoposide and cisplatin (BEP) chemotherapy following an orchidectomy. He was booked for retroperitoneal lymph node dissection (RPLND) two weeks later. After completion of the chemotherapy treatment he was referred for a follow up CT scan. This demonstrated a massive retroperitoneal nodal mass with rim enhancement and a central low density (Figure 1). The mass elevated the aorta anteriorly. The inferior vena cava (IVC) was markedly compressed and displaced anteriorly. The mass extended from the level of the right external iliac vessels superiorly and laterally to the porta-hepatis. There was a large right sided component compressing and displacing the right kidney laterally (fig-