Potentially life-threatening injuries

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Thoracic aortic disruption Traumatic aortic rupture is a common cause of sudden death after a vehicle collision or fall from a great height. The vessel is relatively fixed distal to the ligamentum arteriosum, just distal to the origin of the left subclavian artery . The shear forces from a sudden impact disrupt the intima and media. If the adventitia is intact, the patient may remain physiologically non-compromised. Thoracic aortic injury should be clinically suspected in patients with gross asymmetry in systolic blood pressure (between the two upper limbs, or between upper and lower limbs), widened pulse pressure and chest wall contusion. Erect c hest radiography can also suggest thoracic aortic disruption, the most common radiological finding being a widened media stinum (Figure 29.4). The diagnosis is confirmed by a CT scan of the mediastinum (Figure 29.5). In the hypotensive patient, widening of the mediastinum and aortic injury is not the cause of the hypotension. Inv ariably , these patients have other inju ries causing hypotension as patients with complete aortic dis ruption rarely , if ever, survive to reach hospital. In the presence of thoracic aortic injury , initial manage ment consists of control of the systolic arterial blood pres sure (to less than 120 /uni00A0 mmHg). Thereafter, an endovascular intra-aortic stent (Figure 29.6) can be placed, or the tear can be operatively repaired by direct repair or by excision and grafting using a Dacron g raft. Tracheobronchial injuries Severe subcutaneous emphysema with respiratory compromise can suggest tracheobronchial disruption. A chest drain placed on the a ff ected side will reveal a large air leak and the collapsed lung may fail to re-expand. Bronchoscopy is diagnostic. Treat ment involves intubation of the una ff ected bronchus followed by operative repair. Referral to a trauma centre is advised. - - - - - -

Figure 29.5 Computed tomography scan showing aortic disruption (courtesy of Dr Elizabeth Dick, Consultant Radiologist, Imperial College Healthcare NHS Trust, London, UK). (a) (b) Figure 29.6 (a) Aortic tear showing the presence of a prein /f_l ation stent and test run. (b) Aortic tear post in /f_l ation of the stent and test run (courtesy of Dr Elizabeth Dick, Consultant Radiologist, Imperial College Healthcare NHS Trust, London, UK).

Significant blunt cardiac injury that causes haemodynamic and physiological instability is rare. Blunt myocardial injury should be suspected in any patient sustaining blunt trauma who develops early electrocardiogram abnormalities. Transthoracic echocardiography may show wall motion abnormalities. A transoesophageal echocardiogram may also be helpful. There is very little evidence that enzyme estima tions have any place in diagnosis . All patients with myocardial contusion diagnosed with con duction abnormalities are at risk of developing sudden dys rhythmias and should be closely monitored. Diaphragmatic injuries Any penetrating injury below the fifth intercostal space should raise suspicion of diaphragmatic penetration and, therefore, injury to

abdominal contents. Blunt injury to the diaphragm is usually caused by a com pressive force applied to the torso. The diaphragmatic rupture is usually large, with herniation of the abdominal contents into the chest. Diagnosis of diaphragmatic rupture can easily be missed in the acute phase, and may only be discovered at oper ation or thr ough the presentation of complications. Most diaphragmatic injuries are silent and the presenting features are those of injury to the surrounding organs. There is no single standard investig ation. Historically and in limited resource environments, chest radiography after placement of a nasogastric tube may be helpful (as this may show the stomach herniated into the chest). CT scan and ultrasound scan all lack positive or negative predictive value. The most accurate evalu ation is by video-assisted thoracoscopy or laparoscopy , the lat ter o ff ering the advantage of allowing the surgeon to proceed to a repair and additional evaluation of the abdominal organs. The thorax is at negative pressure and the abdomen is a positive pressure. A complication of a breach of the diaphragm is herniation of abdominal contents into the chest. This may present m uch later, and strangulation of any of the contents can then occur, with a high mortality rate. Operative repair is recommended in all cases. All penetrating diaphragmatic injury must be repaired via the abdomen – and not the chest – to rule out penetrating hollow viscus injury . Oesophageal injury Most oesophageal injuries result from penetrating trauma; blunt injury is rare but should be suspected in patients exposed to barotrauma. A high index of suspicion is required. The patient can present with odynophagia (pain on swallowing saliva, foods or fluids), subcutaneous or mediastinal emphy sema, pleural e ff usion, air in the perioesophageal space and unexplained fever. Mediastinal and deep cervical emphysema are evidence of an aerodigestive injury until proven otherwise. T he mortality rate rises exponentially if treatment is delayed. A combination of CT with oral contrast and oesoph agoscopy confirms the diagnosis in the great majority of cases. The treatment is operativ e repair of any defect and drainage. Pulmonary contusion Pulmonary contusion occurs more frequently following blunt trauma, and is usually associated with a flail segment injury and the major cause of hypoxaemia after blunt trauma. Following gunshot wounds, there is an area of contusion from the shock wave of the b ullet. The natural progression of pulmonary contusion is worsen - ing hypoxaemia for the first 24–48 hours. Chest radiographic findings may be typically delayed. Contrast CT scanning can be confirmatory . Haemoptysis or blood in the endotracheal - tube is a sign of pulmonary contusion. In mild contusion, the treatment is oxy gen administration, pulmonary toilet and ade - - quate analgesia. In more severe cases mechanical ventilation is - necessary . Normovolaemia is critical for adequate tissue perfu - sion and fluid restriction is not advised. Potentially life-threatening injuries

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