

Traumatic aortic transection

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Traumatic aortic transection is an uncommon but often fatal injury. It is typically a high energy injury and may occur in the multiply injured patient. This injury is often missed. There is evidence that airbags and seat belts protect against these injuries. We present the case of a patient who survived. *European Journal of Emergency Medicine* 12:133–135 © 2005 Lippincott Williams & Wilkins.

Introduction

A 55-year-old woman driver was received in the resuscitation room after a single vehicle road traffic accident. She had been travelling in her car at approximately 45 mph before losing control and colliding head-on with a tree. She had been seat belt restrained, the vehicle did not have airbags, and she had not been able to extricate herself from the vehicle at the scene. On arrival in the emergency department she was clinically shocked with a pulse of 104 bpm, oxygen saturation of 82% on room air, and a left brachial systolic blood pressure of 70 mmHg. She complained of sharp and pleuritic chest pain radiating to her back, and her cervical spine had been immobilized. Her scored Glasgow Coma Scale was 15.

This lady was assessed and treated following advanced trauma life support guidelines, and a primary survey did not demonstrate any immediate life-threatening condition. Oxygen administration and fluid resuscitation were commenced and a trauma radiological series was performed. This demonstrated no evidence of pelvic or cervical spine injury; however, anteroposterior radiograph of the chest showed a widened mediastinum (Figure 1). Further examination demonstrated an impalpable left radial pulse, a significant discrepancy between right and left brachial blood pressures (right 102/68, left 74/54 mmHg). The cervical spine was then cleared clinically. A diagnosis of great vessel injury was made, and the patient underwent computed tomography (CT) imaging of her thorax and abdomen, which confirmed a diagnosis of traumatic transection of the thoracic aorta immediately distal to the left subclavian artery. An associated mediastinal haematoma was noted, with no evidence of any other intraperitoneal injury (Figure 2).

The patient was transferred to the regional cardiothoracic unit, where emergency repair of the aortic transection with a woven dacron graft was performed. This procedure was successful and she was stabilized in the intensive

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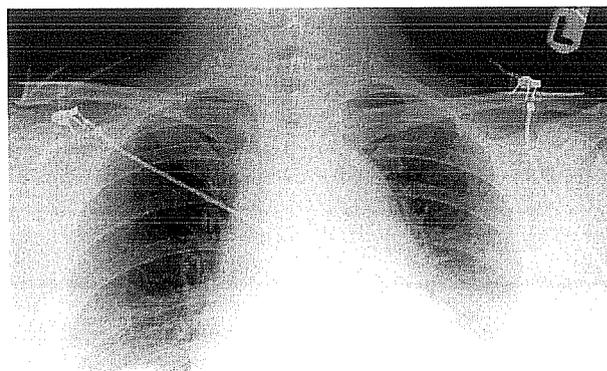
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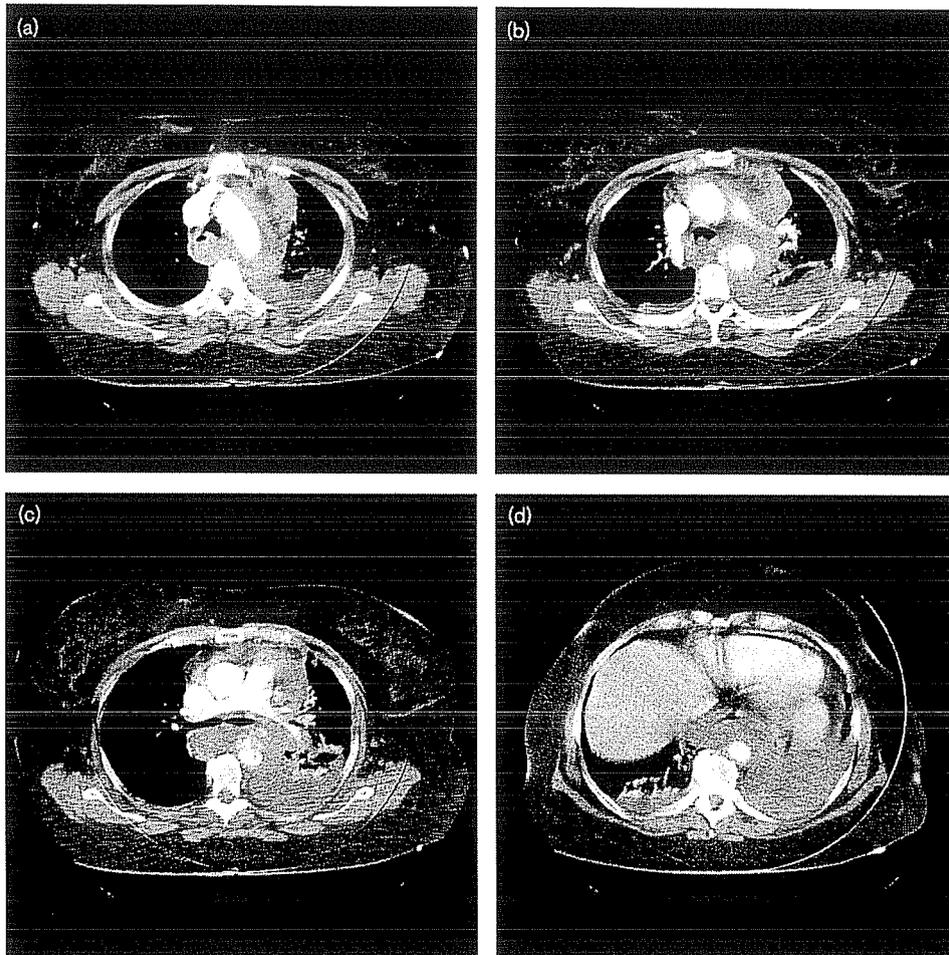
care unit. Postoperative recovery was complicated on day 5 by clinical evidence of abdominal peritonism, and repeat CT was performed. This showed a duodenojejunal perforation, with evidence of continuing leak. The patient underwent a laparotomy with oversew of the rupture, and made a rapid recovery. She was returned to her local hospital for rehabilitation and in postoperative week 4 she became increasingly dyspnoeic and complained of mild pleuritic chest pain. CT pulmonary angiography demonstrated extensive and bilateral pulmonary infarcts (Miller score 16). She was treated with prophylactic heparin for thromboprophylaxis. After consultation with the cardiothoracic centre and a case discussion, the patient was warfarinized. She continued to have recurrent episodes of desaturation and chest pain

Fig. 1



Primary survey chest radiograph.

Fig. 2



Initial contrast computed tomography imaging of thorax. (a) Above the level of transection; (b) and (c) at the level of aortic injury; (d) below the level of aortic injury.

despite anticoagulation. A Doppler ultrasound scan demonstrated extensive right-sided above knee deep venous thrombosis extending from the superficial femoral vein to the popliteal and proximal calf veins. This required the insertion of a portocaval filter, and the patient has subsequently made a good recovery. She was discharged to continue rehabilitation in her local cottage hospital in postoperative week 6.

Discussion

Traumatic transection of the aorta has previously been described and associated with car accidents [1]. It is often a fatal injury and the diagnosis is often missed. Early recognition is important for the survival of these patients [2]. The nature of these injuries often involves high energy transfer. In survival, these injuries are often

associated with other injuries that may be occult or initially masked.

Seat belt restraints have been shown to be better at protecting against traumatic aortic transection than airbags, although both are effective. The protective effect of airbags is limited to patients who are seat belt restrained [3]. A high degree of clinical suspicion must be entertained when the mechanism of injury supports this diagnosis. CT is a useful radiological tool to aid this diagnosis and estimate prognosis or operability; however, the initial chest radiograph has been identified as vital in achieving early diagnosis [4]. Key chest radiograph features that might suggest this diagnosis have been described [5]. Transoesophageal echocardiography has also been suggested as a diagnostic tool [4]. This is not as widely available as CT in the emergency department setting.

Protocols have been shown to improve outcomes for trauma patients [6]. These protocols should address critical or life-threatening issues first and provide a method for reassessing the patient in the light of clinical findings and continuing investigations. The advanced trauma life support guidelines provide a systematic approach to the management of the trauma patient.

Up to 91% of patients with this injury die at the scene of the accident. Many of those who leave the scene of the accident alive do not have their injuries recognized or do not survive resuscitation. Overall mortality has been estimated at 98% [1]. A high index of suspicion is required to identify these patients early and to ensure that they are investigated and treated appropriately. Even when patients survive these significantly adverse odds,

they will share many of the same postoperative complications as other patients undergoing major surgery.

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