

Subintimal Hematoma of the Aorta after Deceleration Injury

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Deceleration injuries of the aorta may occur without aortic disruption. We describe the case of a patient with a subintimal hematoma of the aorta that resolved within 48 hours. Serial arteriography confirmed the diagnosis and excluded aortic rupture. Thoracic exploration was not performed. (Tex Heart Inst J 1995;22:268-70)

Survival of patients with aortic disruption after rapid deceleration depends on early recognition and surgical repair. Eighty-five percent of patients with aortic disruption die before reaching the hospital and over 20% of survivors die within 6 hours if untreated.¹ Aortic injury without intimal or adventitial disruption can occur but is rarely recognized, and treatment options for this kind of injury are unclear.

Subintimal aortic hematoma after deceleration injury has not been well documented, and optimal treatment of this traumatic lesion (in contrast to treatment of aortic disruption) is not known. We describe the case of a patient with a subintimal hematoma of the descending thoracic aorta without associated aortic disruption, who was successfully managed without surgical intervention.

Case Report

In March of 1992, a 28-year-old man sustained rapid deceleration injury and blunt thoracic trauma in a motor vehicle accident. The patient was wearing a seat belt at the time of the injury and remained hemodynamically stable on transfer to the hospital (blood pressure, 165/94 mmHg; heart rate, 115 beats/min). Physical examination revealed that the patient's lungs were clear to auscultation and that he had sustained a closed right femoral shaft fracture and a left clavicular fracture. A chest radiograph (Fig. 1) demonstrated a mediastinal stripe on the left and a pleural cap, suggesting a mediastinal hematoma. A thoracic aortogram (Fig. 2) revealed a smooth intima without dye extravasation. However, a subintimal filling defect was noted. Magnetic resonance imaging (MRI) and transesophageal echocardiography (TEE) indicated a normal aortic contour and no evidence of disruption. The subintimal hematoma seen on arteriography was not discernable using either of these 2 diagnostic techniques. The patient's blood pressure was monitored continuously in the intensive care unit. Arteriography repeated 48 hours later demonstrated that the subintimal hematoma had nearly resolved (Fig. 3). No other abnormalities were found. Repeated TEE and dynamic computerized tomographic (CT) scanning of the thoracic aorta were also normal. The patient underwent internal fixation of his orthopedic injuries and thereafter made an unremarkable recovery.

Discussion

Aortic disruption after rapid deceleration and blunt thoracic trauma may be best defined by arteriography, although recent studies have suggested a role for CT scanning and transesophageal echocardiography in the diagnosis of this lesion.² The spectrum of aortic injury in terms of trauma to the intima alone, both the intima and the media, or to all 3 layers remains poorly analyzed. One autopsy series³ studied 296 patients with nonpenetrating traumatic injury to the aorta, with or without associated cardiac injury. The group included 20 patients with

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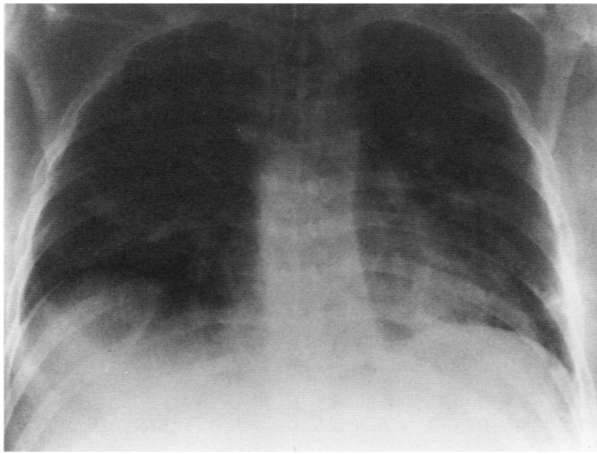


Fig. 1 Chest radiography performed on admission demonstrated a mediastinal stripe and pleural cap.

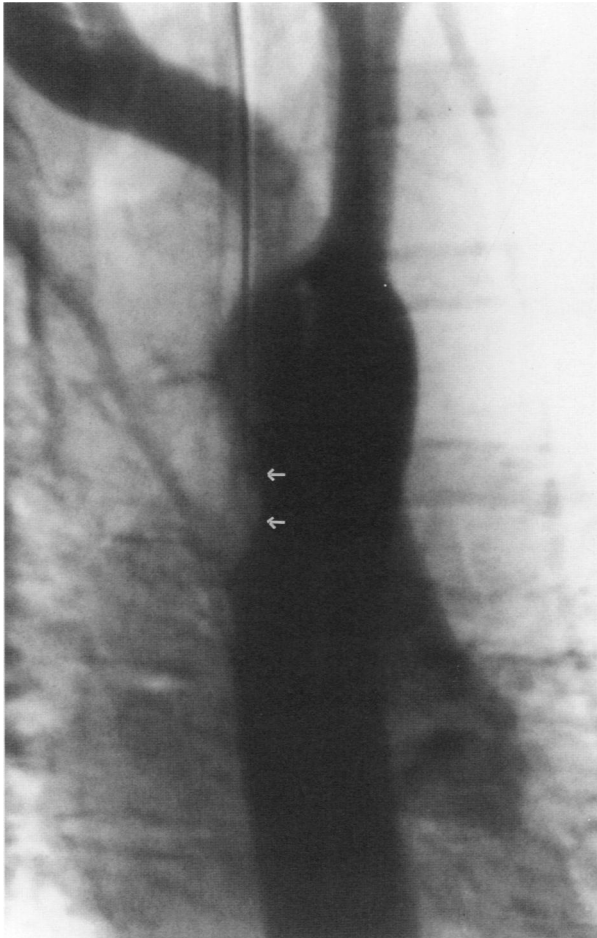


Fig. 2 Aortography performed on admission revealed a smooth intima and a 2-cm subintimal filling defect (as indicated by the arrows) in the descending thoracic aorta.

aortic laceration (1 or 2 layers) and associated cardiac injury. Patients with subintimal hemorrhage alone were not separated from those with subintimal



Fig. 3 Aortogram, 48 hours later. No extravasation of contrast material or other indication of aortic disruption is seen. The arrows indicate the approximate site of the original injury, which is now improved.

hemorrhage associated with laceration of 1 or 2 layers of the aortic wall. The authors concluded that traumatic injury to the aorta ranged (in ascending order of severity) from intimal hemorrhage to intimal hemorrhage with lacerations, medial laceration, complete laceration of the aorta, false aneurysm formation, and periaortic hemorrhage. According to Greendyke,¹ the majority of aortic injuries involve complete transection of the aortic wall. To our knowledge, the appropriate management of intimal injury alone has not been discussed in the literature. In this case, thoracotomy was not performed, on the premise that thoracic exploration for repair of aortic injury cannot be recommended without arteriographic findings confirming that a reparable injury exists.⁴

In the case presented, the mechanism of injury and the radiographic findings support the diagnosis

of a subintimal hematoma. As demonstrated in the study by Parmley and colleagues,³ a subintimal hematoma may be part of a continuum in the process of aortic disruption, since the intima and the media tear with the movement of the descending aorta. No evidence of aortic disruption or laceration was associated with this subintimal hematoma, however. The detection of the subintimal hematoma and of its subsequent resolution reaffirms the value of arteriography in the evaluation of aortic trauma from deceleration injuries, and as a means of following such injuries. In this instance, neither MRI nor TEE demonstrated the subintimal injury; although we repeated TEE and performed a CT scan during follow-up, we considered the repetition of arteriography to be diagnostic. Nonoperative management may be the optimal form of therapy in selected cases of aortic trauma, when injury is limited to the intima.

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