Case report

Periaortic haematoma due to traumatic avulsion of an intercostal artery

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1. Introduction

Periaortic haematoma due to blunt injuries to the intercostal artery is unusual, and periaortic haematoma after traumatic avulsion of an intercostal artery treated with non-operative management without endovascular embolisation has never been reported in the literature. Here, we report the case of a woman with a motor vehicle accident and who consequently developed the haematoma around the descending aorta after right intercostal artery injury.

2. Case report

An 80-year-old woman was brought to the emergency department after a motor vehicle accident. Her consciousness was E1V1M5 on the Glasgow Coma Scale at arrival, and other vital signs were stable. Orotracheal intubation was done. Initial chest radiographs was thought not to demonstrate a widened mediastinum. A focussed assessment with sonography for trauma (FAST) examination revealed no effusion. Because the patient was haemodynamically stable, we were able to perform a radiographic work-up along with computed tomography of the head, cervical area, chest, abdomen and pelvis. Subarachnoid haemorrhage around the bilateral sylvian fissure and the right ambient cistern were noted. Mediastinal haematoma and extravasation from the right intercostal artery at the level of Th6 were also identified (Fig. 1), without any accompanying fracture of the rib or the vertebra. No abdominal organ injury was detected. Angiography was not performed because the patient was haemodynamically stable. The computed tomography was performed on days 2 and 5, revealing decreased mediastinal haematoma and no sign of pseudo-aneurysm of the intercostal artery. The patient recovered from her injuries without sequelae.

3. Discussion

Injury to the thoracic aorta is common and well recognised in blunt trauma. Lesions of the thoracic aorta after blunt trauma are usually located at the aortic isthmus. Deceleration injury causes aortic injury at this point, as this site represents the most important intrathoracic fixing point of the heart. Traumatic injuries to the intercostal artery at its origin, as described in the present case, are rare. To the best of our knowledge, periaortic haematoma after traumatic avulsion of an intercostal artery treated with non-operative management without endovascular embolisation has never been reported in the literature.

Injuries to the intercostal artery at its origin are unusual because this vessel is well protected by pleura and is located deep in the chest. Exclusive injury to this vessel by blunt trauma is rarely encountered. Most reported injuries of the intercostal artery at its origin are due to blunt trauma. A case of pseudo-aneurysm of the intercostal artery treated with open surgical repair has been reported after a skiing accident. Another case of ruptured pseudo-aneurysm of the intercostal artery 2 months after a blunt thoracic injury treated by surgery has been reported. A case of mediastinal haematoma resulting from falling treated with surgical repair has been reported. However, periaortic haematoma after traumatic avulsion of an intercostal artery treated with non-operative management without endovascular embolisation is unusual.

Mediastinal haematoma generally occurs after significant vascular injury (such as injury to the intercostal artery, the internal thoracic artery, the innominate artery or great vessels) or sternal fracture. In our patient, there was no evidence of sternal fracture, rib fracture, thoracic vertebral fracture or aortic injury. A shearing mechanism associated with sudden deceleration caused by a motor vehicle accident might have caused the intercostal injury in our patient. In our case, the intercostal artery injury might be accounted for by the vertical deceleration injury combined with distraction forces from an extension injury to the right head. The physician should consider not only significant vascular injury but also minor vascular injury (such as injury to the intercostal artery) caused by a severe stretching or shearing mechanism when there is no chest injury and periaortic haematoma.

In a case of mediastinal haematoma accompanied with haemodynamic instability, treatment with surgery or...
Endovascular embolisation is recommended. Endovascular aortic stent grafting or embolisation is useful, if patients are haemodynamically unstable. However, even for endovascular repair, spinal cord ischaemia has to be considered, if over-stenting or embolisation of multiple intercostal arteries or the Adamkiewicz artery is inevitable.\textsuperscript{3,6} Occlusion of this artery is associated with an increased risk of spinal cord ischaemia. Hence, if patients are haemodynamically stable, non-operative management without endovascular repair may be useful. Taking into account this type of vascular injury will result in more frequent consideration, more rapid referral of appropriate imaging and more timely diagnosis and treatment without significant delay.

4. Conclusion

Periaortic haematoma after a blunt injury to the right intercostal artery is rare. In the present case, the bleeding arteries were identified with computed tomography. Non-operative management without endovascular embolisation was successful. Taking account of this injury by the physician will result in more frequent consideration and more timely diagnosis when there is no chest injury and periaortic haematoma. If patients are haemodynamically stable, non-operative management without endovascular repair may be useful.

References


![Fig. 1. Computed tomography revealed periaortic haematoma and extravasation from the right intercostal artery at the level of Th6 (white arrow).](image-url)