



Acute Type B Aortic Dissection with Right Hemothorax

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Normal descending aorta is in the left thorax. Thus, ruptured type B aortic dissection more commonly presents with left hemothorax. However, there is a case of type B dissection complicated with right hemothorax.

Key words: Aortic dissection, aortic stenting, hemothorax, thoracic endovascular aortic repair

INTRODUCTION

We report a patient with type B aortic dissection which ruptured into the right hemothorax to call attention to this infrequent presentation and to accentuate the value of computed tomography angiography (CTA) with multiplanar reformatting in localizing the dissection and demonstrating the rupture site.

CTA in combination with two and three-dimensional reformatting is crucial for surgical planning because of the low specificity of transesophageal echocardiography (TEE) in the ascending aorta.

An acute dissection of the thoracic aorta, one of the most common causes of aortic emergencies, requires prompt diagnosis and treatment.¹ The presence of dissection, the dissection type, and its complications can be determined with a sensitivity and specificity of nearly 100% through CTA.² Aortic rupture is a common and fatal complication of type B aortic dissection. A ruptured dissection usually causes left hemothorax.³ Herein, we present a case of ruptured Stanford type B aortic dissection which caused right hemothorax.

CASE REPORT

A 45-year-old woman with a history of hypertension was admitted to the district general hospital due to right chest and back pain. The chest radiograph revealed complete collapse of the right lung and blunting of right costophrenic angle. Massive blood and blood clots were drained after chest tube

insertion. Contrast CT demonstrated ruptured type B aortic dissection with massive right hemothorax [Figure 1]. The patient was referred to our center for further evaluation and management. Laboratory studies revealed a hemoglobin level of 8.8 g/L. A extravasation at the mid-descending thoracic aorta was noted by aortogram. The origin of the celiac trunk was from true lumen according to CTA. Thus, emergent thoracic endovascular aortic repair (TEVAR) procedure was subsequently performed with thoracic aortic stent graft (Gore, 26 mm × 26 mm × 150 mm, 31 mm × 31 mm × 150 mm), starting from distal to the origin of the left subclavian artery and extending into the origin of the celiac trunk. The rupture site was covered, and the left subclavian artery was preserved. Postoperatively, the patient sustained acute renal failure in the intensive care unit. The spinal cord ischemia protection strategies were applied including intraoperative hypothermia and hypotension avoidance and no paraplegia occurred. However, the patient failed to wean from mechanical ventilator, so she received a tracheostomy. Afterward, she had gradual resolution and was transferred to general ward, and postoperative CT scan showed no residual dissection flap [Figure 2].

DISCUSSION

Aortic dissection is fatal if rupture happened. When left untreated, about one-third of patients die within the first 24 h, and half of them die within 48 h.¹ Aortic rupture is thus the

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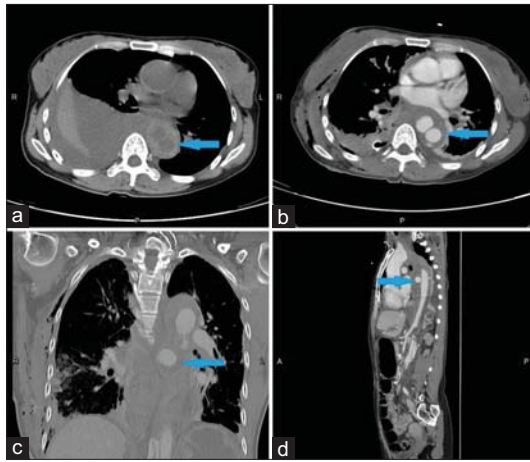


Figure 1: Computed tomography of the chest with contrast demonstrated ruptured type B aortic dissection (arrow) through the mediastinum complicated with massive right hemothorax. (a) Axial view of CT without contrast, (b) Axial view of CT with contrast, (c) Coronal view of CT with contrast, (d) Sagittal view of CT with contrast

most common life-threatening complication of dissections. Hemothorax accounts for 10% of the DeBakey type III dissection mostly followed by aortic ruptures and is often located on the left. The clinical presentation of ruptured type B aortic dissection rarely presents with right hemothorax.² As far as we know, apart from cases of a ruptured nondissecting aortic aneurysm, there have been only 6 cases in the previous literature of right hemothorax secondary to rupture of an aortic dissection.³⁻⁵

Surgical treatment of ruptured type B dissection includes open and endovascular repair. Compared with previous cases, open repair is related to high mortality and morbidity.⁶ Open repair is frequently accompanied with larger surgical wounds, longer operative time, and more blood loss. Prolonged hemorrhagic shock caused by ruptured type B aortic dissection may lead to multiple organ dysfunctions including gastrointestinal bleeding, acute kidney injury, maldigestion, and even hypoxic encephalopathy. As a result, the patient has a long road to recovery. Endovascular repair provides a less invasive and efficient option for the management of ruptured type B aortic dissection.

Besides, early diagnosis of type B dissection with right hemothorax is crucial to improve patient outcomes. The differential diagnosis of hemothorax includes spontaneous pneumothorax, coagulopathy, vascular disease, neoplasia, and miscellaneous. We should use a fast and efficient diagnostic tool at emergency department. CT should be the first diagnostic test that is commonly available to identify the possible cause of hemothorax. Besides, CTA can provide information about the target organ perfusion for surgical planning. TEE has high specificity for the diagnosis of aortic dissection,^{7,8} but it requires experienced staff and patients' cooperation.

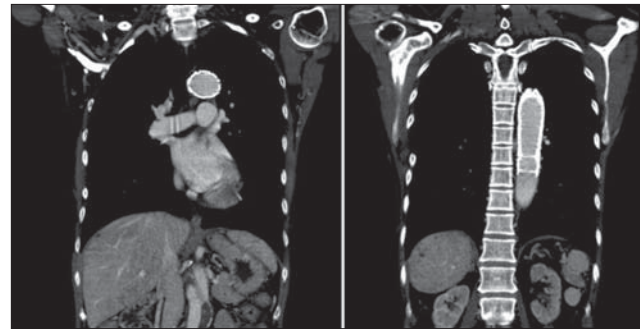


Figure 2: Neither residual dissection nor pleural effusion in the ordinary ward

In conclusion, the key to successful management is early diagnosis and endovascular treatment.

CONCLUSION

As previously reported the intimal tear of the descending aorta at the level of the mid-thoracic spine bled into the posterior mediastinum and crossed the midline to rupture into the right pleural space. The patient's image had well demonstrated the picture of posterior hemomediastinum and right hemothorax. Four of six cases in the literature died intraoperatively or postoperatively.⁹ Because the level of the rupture site was at the mid-thoracic descending aorta, the necessary landing zone was relatively longer. Therefore, the patient underwent successful TEVAR with an open arch repair and survived. This case emphasizes not only the possibility of right-sided hemothorax caused by ruptured descending aorta but also the higher success rate of treatment with TEVAR.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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