Case Report

Rupture of Thoracic Aneurysm and Aortic Dissection With Manifestation of Subcutaneous Hematoma

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We report a case with rare signs of subcutaneous hematoma, ecchymoses, and pleural effusion resulting from rupture of a thoracic aneurysm and aortic dissection. An 81-year-old woman had a history of aneurysm for 4 years. Ruptured chronic thoracic aortic dissection was diagnosed in the patient. After 2 weeks of medical therapy, the hematoma in the chest wall was absorbed, the pleural effusion almost disappeared, and the patient's general condition improved. At 6 months follow-up, the patient had no chest discomfort. This case highlights an uncommon sign of ruptured thoracic aneurysm and aortic dissection that clinicians should be aware of.

RÉSUMÉ

Nous décrivons un cas où la rupture d'un anévrisme de l'aorte thoracique et une dissection aortique ont été précédés de signes rares, soit un hématome sous-cutané, des ecchymoses et un épanchement pleural. Une femme âgée de 81 ans présentait des antécédents d'anévrisme depuis 4 ans. Cette patiente a reçu le diagnostic de dissection chronique de l'aorte thoracique et de rupture aortique. Après 2 semaines de traitement médical, l'hématome de la paroi thoracique s'était résorbé et l'épanchement pleural était pratiquement disparu. L'état général de la patiente s'est amélioré. Au suivi à 6 mois, la patiente ne présentait aucune gêne dans la poitrine. Ce cas met en lumière des signes peu courants de la rupture d'un anévrisme de l'aorte thoracique et de dissection aortique dont les cliniciens doivent avoir connaissance.

Presentation

An 81-year-old woman was admitted to the local hospital with fatigue, lightheadedness, right chest pain, and discomfort for 2 days; her symptoms were progressively worse during activity. She had a history of hypertension for 10 years with blood pressure of 160/90 mm Hg, and chronic aneurysm and aortic dissection were both diagnosed in 2015 and 2016 (Fig. 1, A and B). Her hemoglobin was 97 to 107 g/L during the last 2 years.

The patient's temperature was 36.8°C, pulse was 79 beats/min, respiratory rate was 18 breaths/min, and blood pressure was 154/79 mm Hg. The right thorax was full and swollen, and ecchymoses and swelling were seen in the chest, hypochondrium, and lumbar regions with mild pressing pain (Fig. 2). Slightly lower breath sounds were heard in the right lung. Two days after hospitalization, chest tightness and shortness of breath, pale complexion, and pale conjunctiva developed in the patient; the hemoglobin decreased to 28.2 g/L.

Chest computed tomography showed that the descending aorta and abdominal aorta were widened, and the separation was visible. A curved high-density shadow in the right thoracic cavity was seen (Fig. 1C). Three days later, chest computed tomography angiography showed that the ascending aorta and aortic arch were evenly thick, and the descending aorta and abdominal aorta (above the double renal hilum level) were thickened. The descending aorta and abdominal aorta showed a floating band sign. Filling defects were seen in the abdominal aorta (Fig. 1, D and E). A high-density shadow was seen in the bilateral thoracic cavities and was evident on the right side (Fig. 1D). Compared with the

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Figure 1. (A) April 22, 2015. Heart ultrasound showed an inner diameter of 40 mm in the ascending aorta; the descending aorta was widened with a wide inner diameter of 45 mm; there was a strip of light band and a group of low echoes with a range of approximately 21×18 mm. The diagnosis was aneurysm and aortic dissection. (B) April 3, 2016. Chest x-ray showed circular soft tissue density at the right cardiophrenic angle, suggesting elongation of the descending segment in the aorta. The diagnosis was aneurysm and aortic dissection. (C) July 27, 2017. Chest computed tomography showed that the descending aorta and abdominal aorta were widened, and a separation was visible. The curved high-density shadow in the right thoracic cavity was seen, and the thickest part was approximately 18 mm. The right chest wall was thickened. The diagnosis was ruptured aneurysm, aortic dissection, and right pleural effusion. (D, E) July 30, 2017. Chest computed tomography angiography showed that the ascending aorta and aortic arch were evenly thick. The descending aorta and abdominal aorta showed a floating band sign. The curved high-density shadow was seen in the bilateral thoracic cavities, and the thickest part was approximately 94 mm. The right chest wall was significantly thickened. The diagnosis was ruptured aneurysm, aortic dissection, and bilateral pleural effusion. (F) After 6 months of follow-up, chest computed tomography showed that the manifestations of chronic aneurysm and aortic dissection were still visible, while only a small arc-like liquid low-density shadow in bilateral thoracic cavities was seen, and the thickness of the chest wall on both sides was basically the same.

Novel Teaching Points

1. Subcutaneous hematoma can be a sign of intrathoracic hemorrhage.
2. Pleural hemorrhage or subcutaneous hematoma can be the initial manifestation of ruptured aortic dissection.
3. For elderly patients with chronic thoracic aortic dissection, the clinician should be highly alert to the rupture of thoracic aortic dissection when the patient has subcutaneous hematoma accompanied by acute reduction of hemoglobin.

shadow area 3 days ago (Fig. 1C), the high-density shadow was significantly increased, indicating a marked increase of pleural effusion.

Management

According to the patient's medical history, imaging manifestations, and acute reduction of hemoglobin, rupture of chronic thoracic aortic dissection with subcutaneous hematoma in the right hemothorax was diagnosed. The patient's family, concerned with the patient's older age and high risk of surgery, insisted on conservative treatment. The patient was given oxygen, beta receptor blockers, and symptomatic treatment. Two days after hospitalization, the patient received an infusion of red blood cell suspension and snake venom thrombin because her hemoglobin suddenly decreased to 28.2 g/L. After receiving an infusion of 1.2 L of red blood cell suspension and snake venom thrombin, the patient's condition was gradually stabilized, and her hemoglobin increased to 68 g/L. After 2 weeks of ongoing medical therapy, the hematoma in the chest wall was almost absorbed and the patient's general condition was improved.

At 6 months follow-up, the patient had no chest discomfort. Chest computed tomography showed that only the small arc-like liquid low-density shadow in the bilateral thoracic cavities was visible, the boundary was clear, and the thickness of the chest wall on both sides was basically the same (Fig. 1F).

Discussion

The rupture of a thoracic aneurysm and aortic dissection causing subcutaneous hematoma and right hemothorax are rarely seen.¹⁻³ In this case, according to the patient's imaging findings, pleural effusion, and subcutaneous hematoma, the diagnosis of ruptured aortic dissection aneurysm was clear, and surgical intervention was performed as soon as possible according to the guidelines. However, the patient's family insisted on conservative treatment. Although conservative management for this patient had a good prognosis, it does not conflict with the basic principles of early surgical intervention for ruptured aortic dissection. The subcutaneous hematoma was caused by a large amount of blood entering the chest cavity and the blood infiltrating subcutaneously through the interstitial space of the chest wall. The classic ecchymoses, such as Cullen's and Turner's signs, are the signs of

Figure 2. Physical examination showed ecchymoses and swelling in the lumbar regions (A) and hypochondrium (B).

subcutaneous bleeding in the periumbilicus or abdomen resulting from pancreatitis or other visceral bleeding diseases.⁴ They are caused by blood flowing into the intraperitoneal or retroperitoneal fascial space.⁵ The tissue in the thoracic cavity is denser than in the abdominal cavity, and the blood in the thoracic cavity does not easily penetrate to the subcutaneous tissue to form subcutaneous hematoma or ecchymoses. The exact mechanism involved in the formation of subcutaneous hematoma and hemorrhagic pleural effusion caused by ruptured thoracic aortic dissection remains to be further confirmed by histoembryology, fluidics, and imaging techniques.

Conclusion

This case highlights an uncommon sign of ruptured thoracic aneurysm and aortic dissection that clinicians should be aware of.

Disclosures

The authors have no conflicts of interest to disclose.

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