

CASE IMAGE

Mediastinal hematoma due to traumatic injury to the azygous vein

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Key Clinical Message

Rupture of the azygous vein may result from abrupt deceleration applied to the mobile azygous arch, which can initiate shearing forces within the thorax.

KEYWORDS

azygous vein injury, clinical image, mediastinal hematoma, trauma

An early 80s-year-old woman was referred to our hospital because of dyspnea and dysphagia after falling. She stumbled and fell while getting up, hit her head on a door, and landed her neck in a dorsiflexed position. She denied loss of consciousness at the time of the fall. Her medical history included a stroke 3 years prior to presentation, and she was administered 100 mg of aspirin daily. Her vital signs revealed: body temperature, 36.1°C; blood pressure, 131/63 mmHg; pulse rate, 87/min (regular); respiratory rate, 20/min; and SpO₂ 98%. Physical examination showed swelling in the right cheek and bilateral chest tenderness. The patient's hemoglobin level was 10.8 g/dL. Chest radiography revealed a right-sided hemothorax (Figure 1). Contrast-enhanced chest computed tomography (CT) revealed bilateral pleural effusions, a mediastinal hematoma compressing the trachea and dorsal esophagus, and a paratracheal hematoma at the level of the azygous vein (Figure 2). No apparent damage to the arterial system was observed. Spine CT revealed lumbar compression fractures. Upper gastrointestinal endoscopy revealed anterior esophageal distention without mass lesions or bleeding in the esophagus. The patient was diagnosed with a mediastinal hematoma due to traumatic injury to the azygous vein.

Aspirin was discontinued after admission. On the night of the injury, she experienced oxygen demand, suspected to be due to an increase in right hemothorax. After the injury, the mediastinal hematoma tended to shrink and the anemia did not improve; however, the right hemothorax increased for approximately a week. Nevertheless, the patient did not require intercostal tube insertion because the oxygen requirement did not increase. Three days after injury, her dyspnea and dysphagia improved. By the third post-injury day, the patient no longer required supplemental oxygen. However, her discharge from the hospital was delayed by 2 months due to lumbar compression fractures.

Generally, azygos vein injury presents with mediastinal enlargement, pleural effusion (hemothorax), delayed pleural effusion on chest radiography, hemothorax on right chest drainage, and blood leakage on contrast-enhanced CT. Diagnosis was based on the presence of mediastinum enlargement and late-onset pleural effusion secondary to an episode of trauma. The azygous vein is positioned on the right side of the thoracic vertebrae in the posterior mediastinum.¹ At the level of the fourth thoracic vertebra, the azygos vein arches around the right bronchus from behind and above before entering the superior vena cava.

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This anatomical positioning explains the predominance of a right-sided hemothorax when the azygos vein is injured. In blunt thoracic trauma, azygos vein injury is usually a result of sudden decelerating forces, such as those from motor vehicle accidents or falls.² Rupture of the azygos vein may result from abrupt deceleration applied to the mobile azygos arch, which can initiate shearing forces within the thorax.³ Additionally, associated anterior dislocated fracture of the upper thoracic vertebrae in the proximity of the azygos vein may contribute to venous disruption.³ This may have been the mechanism of injury in our patient, who also sustained a stable thoracic vertebral body fracture. When comparing treatments, the mortality rate for those who underwent thoracotomy was only 31%, which highlights the importance of urgent surgery in these patients.¹ In many cases where emergency surgery is required, the patient's hemodynamics are unstable, making it impossible to perform a CT scan, and damage to the azygos vein becomes apparent during surgery.¹ Published research reports only one case of successful conservative management of a presumed azygos laceration where

diagnosis was made based on a CT scan demonstrating a right paratracheal hematoma at the level of the azygos vein.² Intravascular stents or grafts commonly treat vascular injuries, yet survivors of azygos vein injury often undergo emergency thoracotomy and ligation, typically due to preoperative shock.

AUTHOR CONTRIBUTIONS

Shiori Kase: Conceptualization; data curation; investigation; resources; writing – original draft. **Kiyoshi Shikino:** Conceptualization; methodology; project administration; supervision; visualization; writing – original draft. **Tatsuro Katahira:** Conceptualization; data curation; writing – review and editing. **Kazuki Higuchi:** Conceptualization; data curation; writing – review and editing. **Shinya Aoki:** Conceptualization; resources; writing – review and editing.

FUNDING INFORMATION

None.

CONFLICT OF INTEREST STATEMENT

None.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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FIGURE 1 Chest X-ray revealed right-sided hemothorax.

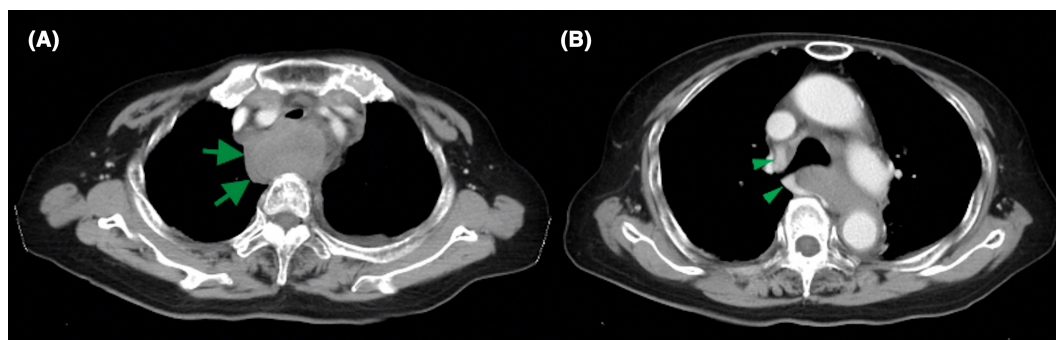


FIGURE 2 (A) Contrast-enhanced chest computed tomography revealed bilateral pleural effusions and a mediastinal hematoma compressing the trachea and esophagus (arrows). (B) Contrast-enhanced chest computed tomography revealed paratracheal hematoma at the level of the azygos vein (arrowheads).

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