Case Report

Journal of Intensive Care and Emergency Medicine

Diagnosis of Anterior Mediastinal Cyst Causing Syncope in the Emergency Department

Istvan Marton[1*], Mate Kover[2] and Peter Dudas[1]

[1]*North-Pest Central Hospital - Military Hospital Emergency Care Center, Hungary*

[2]*North-Pest Central Hospital Military Hospital Central Radiological Diagnostic Department, Hungary*

[*]**Corresponding author**

Istvan Marton, North-Pest Central Hospital - Military Hospital Emergency Care Center, Hungary.

Received: May 26, 2025; **Accepted:** June 02, 2025; **Published:** July 02, 2025

ABSTRACT

We present the case of an 87-year-old male patient who sustained blunt injuries following a collapse. The initial chest X-ray revealed an extremely widened mediastinum. To clarify the etiology, a chest CT angiography was performed, which demonstrated a large anterior mediastinal cyst compressing the aorta, superior vena cava, trachea, and the left thyroid lobe, identified as the underlying cause of the collapse. Due to elevated inflammatory markers, antibiotic therapy was initiated, followed by thoracic surgery using the VATS (Video-Assisted Thoracoscopic Surgery) technique. Intraoperatively, the thyroid involvement suspected on CT imaging could not be definitively confirmed.

Keywords: Mediastinal Cyst, Collapse, Syncope, Thoracic Surgery, Emergency Care

Introduction

This publication does not aim to provide a detailed review of the various types of mediastinal cysts, but only lists them briefly. We present the case of an elderly male patient who sustained a blunt head injury following a syncopal episode. Throughout the case report, we support our findings related to mediastinal cysts with relevant references from international literature. Syncope is one of the most common conditions, with its initial evaluation typically conducted in the emergency department. The primary priority is to rule out potentially life-threatening causes, such as malignant arrhythmias (ventricular tachycardia, atrioventricular blocks, sinoatrial block, sick sinus syndrome), carotid sinus hypersensitivity, vasovagal reaction (e.g., triggered by stress or the sight of blood), pulmonary embolism, aortic aneurysm, aortic dissection, pericardial tamponade, tension pneumothorax, hemorrhage, acute neurological events, severe fluid and electrolyte disturbances (hypo-/hypernatremia, hypo-/hyperkalemia), sepsis, and poisonings (alcohol intoxication, drug or chemical toxicity). During emergency evaluation, these commonly occurring conditions are often absent or only partially evident. In some cases, space-occupying lesions (such as tumors, abscesses, or cystic masses) causing acute symptoms are incidentally discovered. This report presents one such case.

Case Presentation

On April 15, 2025, an 87-year-old male patient was brought to the Emergency Department of ÉPC HK by ambulance. He had not been seen by his family for three days and was found lying prone on the floor at home. He was admitted in a hemodynamically stable condition. The patient reported experiencing a dry cough over the previous few days but denied chest pain, dyspnea, or dizziness. His medical history included diabetes mellitus and hypertension; however, he had not taken his prescribed medications (metformin, glimepiride) due to forgetfulness. The patient denied smoking or alcohol use. On physical examination, hematomas were observed on the face, chest, and knees. Lungs were auscultated as clear bilaterally, without asymmetry. Vital signs were as follows: NIBP: 141/72 mmHg, HR: 100/min, SpO_2: 97%, T: 36.6 °C. The ECG showed mild ST-segment elevation in leads V1–V2.

Laboratory Findings:

- Impaired renal function (eGFR: 45 ml/min/1.73 m²)
- Markedly elevated C-reactive protein (287 mg/L; ref. 0–8 mg/L)

Citation: Istvan Marton, Mate Kover, Peter Dudas. Diagnosis of Anterior Mediastinal Cyst Causing Syncope in the Emergency Department. J Inten Care Emerg Med. 2025. 1(1): 1-3. DOI: doi.org/10.61440/JICEM.2025.v1.04

- Leukocytosis (12.04 G/L; ref. 4.4–11.3 G/L)
- Mild hyperglycemia (8.9 mmol/L)
- Microscopic hematuria (++), ketonuria (++), and normal procalcitonin level
- D-dimer testing was not performed due to the likelihood of false-positive results resulting from the fall and minor traumatic injuries. Carotid massage was negative, and the Schellong test could not be performed due to the patient's general weakness.

Imaging

Chest X-ray (Figure 1) revealed a markedly widened mediastinum. Based on this finding, a chest CT angiography was performed, confirming a space-occupying cystic lesion in the anterior mediastinum compressing the trachea and superior vena cava, displacing the aorta, and appearing in proximity to the left thyroid lobe, though distinctly separate from it (Figures 2-3).

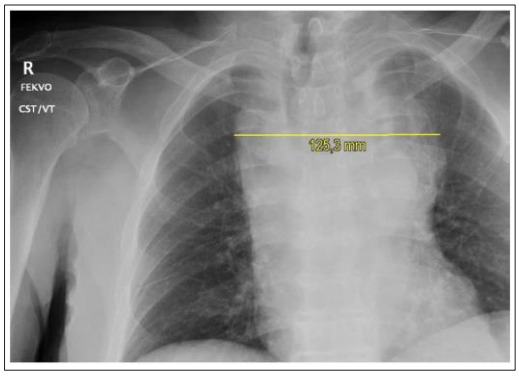

Figure1: The anteroposterior chest X-ray showing extreme mediastinal widening

Figure 2: An approximately 10 cm anterior mediastinal cyst causing compression of the superior vena cava and the aorta

Figure 3: An anterior mediastinal cyst originating near the location of the left thyroid lobe

Consultations and Intervention

Due to suspected thyroid involvement, a head and neck surgery consultation was conducted, which excluded a thyroid origin. Cardiology evaluation (echocardiography) showed no signs of pericardial involvement. The patient was referred to thoracic surgery, and four days later underwent video-assisted thoracoscopic surgery (VATS). Intraoperatively, ventilation was difficult, requiring intermittent ventilation of the operative lung. A tense, fluctuant lesion bulging into the pleura was identified in the anterior mediastinum. Upon opening the connective tissue layer, a dorsally located vein was injured, managed with tamponade and Prolene sutures. The cyst yielded thick, particulate, gruel-like yellow-green contents, which were aspirated, and the cavity was irrigated. The cyst wall only partially collapsed. Drains were placed in the cyst cavity and posterior thoracic cavity near the hilum. The exact origin of the cyst could not be clearly identified intraoperatively. Post-procedure, the lung expanded well without air leak or secondary bleeding, and surgical closure was completed.

Postoperative Course and Follow-up

Following VATS surgery and antibiotic therapy, laboratory parameters showed significant improvement: eGFR 71 ml/min/1.73 m², CRP 45 mg/L, leukocyte count 6.9 G/L. The patient was transferred to the pulmonology ward for continued monitoring and treatment.

Literature Review

Amar et al. in their 2023 study compared various imaging modalities (contrast-enhanced CT, MRI, F-18 FDG PET-CT) and discussed the advantages and limitations of each technique [1]. They concluded that the imaging diagnosis of cystic mediastinal lesions remains a diagnostic challenge. The location and imaging characteristics of these lesions are often sufficient to establish a diagnosis even without histological confirmation. CT, MRI, and ultrasound each offer specific benefits and limitations. CT is typically the first-choice modality for identifying and characterizing such lesions. MRI (including native and contrast-enhanced T1-weighted, T2-weighted, and diffusion-weighted sequences) is a key problem-solving tool. Ultrasound is useful for real-time characterization and for guiding interventional procedures.

Barrios et al. conducted a retrospective analysis of cases between 1977 and 2022, detailing the different types of cysts and specifying which cases require surgical intervention and which may be adequately managed with radiological follow-up [2].

Benjamin et al. published findings from a nine-year study conducted in the U.S., analyzing data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) between 1992 and 2000 [3]. They used representative weighted estimates to determine the incidence and hospital admission rates for patients presenting to emergency departments, stratified by demographic characteristics. Cardiovascular diagnoses at ED discharge (based on ICD-9 codes) were recorded. Of the 865 million ED visits during the nine-year period, 6.7 million (0.77%; 95% CI: 0.69–0.85%) were attributed to syncope.

Diana et al. described cysts located in the anterior, middle, and posterior mediastinum [4]. Their review included additional

case reports comparing surgical techniques such as VATS, robot-assisted thoracoscopy (RATS), and thoracotomy. Minimally invasive approaches (VATS and RATS) have gained prominence due to improved patient outcomes, particularly in terms of reduced hospital stays and chest drain duration.

Frances et al. found that out of 18,898 patients, syncope was diagnosed in 214 cases [5]. Syncope accounted for 1–3% of all ED visits. Their aim was to evaluate the impact of implementing an Integrated Care Plan (ICP) based on the European Society of Cardiology (ESC) guidelines on hospital admission rates and outpatient referrals to the Syncope Management Unit (SMU). They assessed the appropriateness of admissions and referrals, and final diagnoses. Their hypothesis was that introducing the ICP would increase outpatient referrals while ensuring urgent cardiac syncope cases were appropriately admitted.

Fuliang et al. highlighted the advantages of endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) [6]. According to their study, EUS-FNA offers higher diagnostic accuracy for mediastinal cysts than CT and is safe when combined with prophylactic antibiotics. A single puncture with a 19G needle was sufficient for diagnosis and complete cyst drainage, particularly in cases with thin fluid content. Their key findings included:

1. No infectious complications occurred with prophylactic antibiotic use.
2. EUS-FNA may serve as a palliative option for non-surgical candidates.
3. CT often misinterprets cysts as solid lesions.
4. Surgical excision is often warranted even in asymptomatic cases to prevent complications. In summary, EUS-FNA is a safe and accurate method for diagnosing mediastinal cysts, especially with appropriate antibiotic coverage.

Sathyaprasad et al. reported two male patients (ages 54 and 74) who underwent mediastinoscopic cyst removal [7]. Mediastinoscopy is a minimally invasive procedure with a very low morbidity and mortality rate (<0.5% in large series). Standard cervical mediastinoscopy (SCM), as applied by the authors, allows access to both right and left paratracheal areas, the hila, and the carina — common sites for mediastinal cysts.

The authors also described various endoscopic and surgical techniques, including extended cervical mediastinoscopy (ECM), SCM, Chamberlain's anterior mediastinotomy for aorto-pulmonary window lesions, and VATS.

Wackerman et al. provided an overview of widened mediastinum as a radiographic sign frequently seen on plain chest X-rays [8]. The mediastinum is considered widened when it exceeds 6–8 cm in width, depending on the reference source. Possible causes include:

- Ascending and proximal descending aortic aneurysm
- Aortic dissection (ascending and descending)
- Aortic unfolding
- Traumatic aortic rupture
- Hilar lymphadenopathy (infectious or malignant)
- Mediastinal tumors (e.g., lymphoma, seminoma, thymoma)
- Mediastinitis
- Cardiac tamponade
- Rib or thoracic vertebral fractures

Major syncope studies did not mention mediastinal cysts as a cause, underscoring the rarity of this condition [3,5].

Conclusions

Mediastinal cysts are rare but clinically significant findings, especially when syncope is the presenting symptom. In cases where mediastinal widening is detected in the emergency department, rapid and accurate diagnosis can be life-saving, as several life-threatening conditions—such as aortic dissection, aneurysm, or abscess—may present with similar radiological features. The observation presented in this report highlights the crucial role of imaging and multidisciplinary collaboration in the identification and differential diagnosis of mediastinal cysts.

References

1. Amar Shah Carlos, Rojas A. Imaging modalities (MRI, CT, PET/CT), indications, differential diagnosis and imaging characteristics of cystic medias masses: a review [Folyóirat]. Mediastinum. 2023. 7: 3.
2. Barrios Paola, Patino Diego Avella. Surgical indications for mediastinal cysts—a narrative review [Folyóirat]. Mediastinum. - 2022. 6: 31.
3. Benjamin C Sun, Jennifer Emond A, Carlos Camargo A Jr. Characteristics and admission patterns of patients presenting with syncope to U.S. emergency departments, 1992-2000 [Folyóirat]. Academic Emergency Medicine. 2004. 11: 1029-1034.
4. Diana Hsu S, Kian Banks C, Jeffrey Velo B. Surgical approaches to mediastinal cysts: clinical practice review [Folyóirat]. Mediastinum. 2022. 6: 32.
5. Frances McCarthy, Geraldine McMahon C, Una Geary, Patrick Plunkett K, Rose Anne Kenny, et al. Management of syncope in the Emergency Department: a single hospital observational case series based on the application of European Society of Cardiology Guidelines [Folyóirat]. EP Europace. 2009. 11: 216-224,.
6. Fuliang Cao, Sicong Zhang, Zhenbo Dai, Qianqian Fu, Feng Guo, et al. Diagnosis of mediastinal cysts: the role and safety of EUS–FNA with 19-gauge needle: a retrospective cohort study [Folyóirat]. Journal of Thoracic Disease. 2022. 14: 3544-3551.
7. Sathyaprasad Burjonrappa C, Raymond Taddeucci, Joseph Arcidi. Mediastinoscopy in the Treatment of Mediastinal Cysts [Folyóirat]. Journal of The Society of Laparoscopic & Robotic Surgeons. 2005. 9: 142-148..
8. Wackerman Gnugnoli L. National Library of Medicine [Online]. 2023.