CASE REPORTS

PRESTERNAL SUBCUTANEOUS BRONCHOGENIC CYST: AN UNUSUAL ECTOPIC PRESENTATION OF A CONGENITAL LESION

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Abstract

Bronchogenic cysts are rare benign congenital lesions, most commonly located within the thoracic cavity, particularly in the mediastinum or pulmonary parenchyma. Subcutaneous presternal bronchogenic cysts are exceedingly uncommon, with fewer than 80 cases reported in the literature since their first description in 1945. We report a rare case of a 14-year-old girl presenting with a progressive presternal midline swelling since childhood, previously managed by needle aspiration with subsequent recurrence. Thoracic computed tomography suggested a thyroglossal duct cyst. Complete surgical excision through a cervical incision was performed, and histopathological examination confirmed the diagnosis of a bronchogenic cyst. This case highlights the diagnostic challenges of presternal cystic masses and underscores that complete surgical excision is the only curative treatment, as needle aspiration invariably leads to recurrence.

Keywords: *Bronchogenic cyst; Presternal; Subcutaneous; Congenital; Surgical excision*

INTRODUCTION

Bronchogenic cysts are congenital cystic malformations of the respiratory tract resulting from abnormal budding of the primitive tracheobronchial tree during early fetal development, typically between the 22nd and 33rd days of gestation.[1] They are most commonly located within the thoracic cavity, particularly in the mediastinum or pulmonary parenchyma. Subcutaneous bronchogenic cysts are exceedingly rare, and among reported ectopic sites, the suprasternal and presternal regions are the most frequently involved, followed by the neck, scapular region, and abdominal wall.[1,2]

Two main embryological theories explain ectopic localization. The first suggests that an abnormal separation of primitive respiratory tissue from the tracheobronchial tree may allow migration to aberrant locations.[2,3] The second proposes that bronchial buds may become "pinched off" during midline fusion of the sternal bars, thereby becoming trapped in the presternal subcutaneous tissue and differentiating into a bronchogenic cyst.[2,4]

We report a rare case of a presternal subcutaneous bronchogenic cyst in an adolescent girl and discuss the diagnostic and therapeutic challenges of this unusual entity.

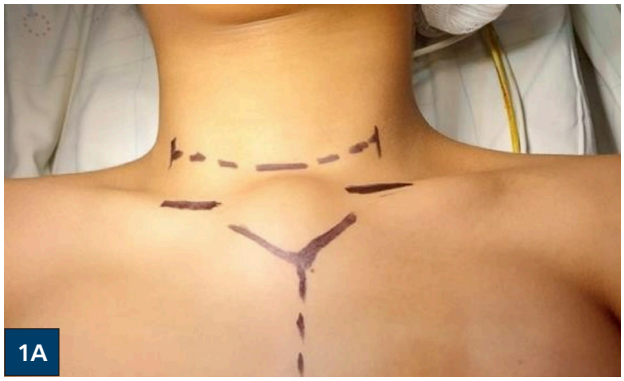
CASE REPORT

A 14-year-old girl, born to non-consanguineous parents with no significant past medical or surgical history, presented with a progressive painless presternal midline swelling that had been present since childhood. At the age of 9 years, the lesion had been treated by needle aspiration; however, recurrence occurred within a few months.

On physical examination, a well-circumscribed, soft, mobile, non-tender swelling was identified in the midline cervicothoracic region, at the level of the manubrium sterni, measuring approximately 4 cm in transverse diameter. There was no fistulous opening, discharge, skin inflammatory changes, or adherence to the deep planes. (Figure 1)

Thoracic computed tomography (CT) demonstrated a unilocular presternal cystic lesion with suspected retrosternal extension, initially reported as consistent with a thyroglossal duct cyst. (Figure 2)

Under general anesthesia, surgical exploration was performed through a 4-cm transverse cervical incision along the upper border of the manubrium sterni. Subcutaneous



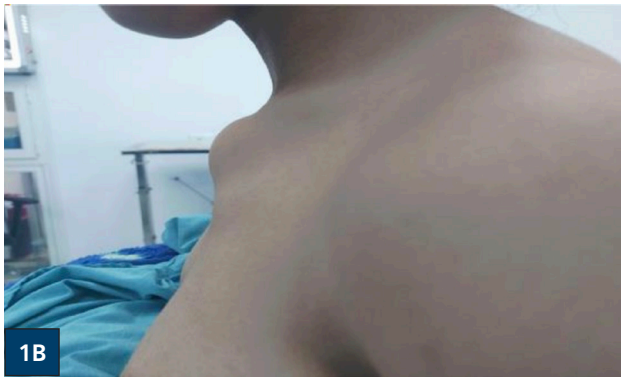
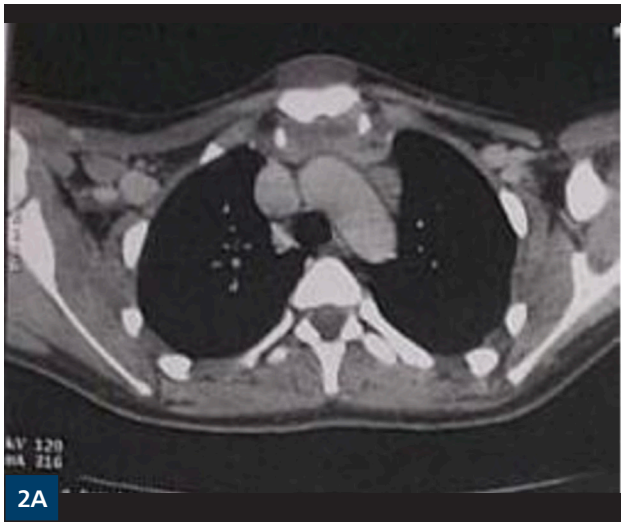


Figure 1 *Anterior (A) and Profile (B) view of the presternal swelling.*



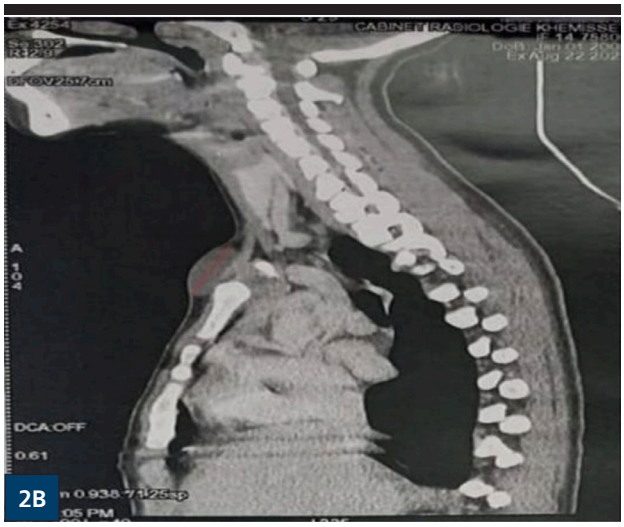


Figure 2 *Mediastinal window of thoracic CT (A) Axial section (B) Sagittal section showing the presternal cystic formation.*

dissection revealed a 3-cm unilocular cystic lesion with a thin, whitish, glistening wall, located entirely within the subcutaneous tissue, with no adhesion to the overlying skin or underlying fascia. During dissection, the cyst ruptured incidentally, releasing clear mucoid fluid; however, complete excision of the cyst wall was achieved. (Figure 3)

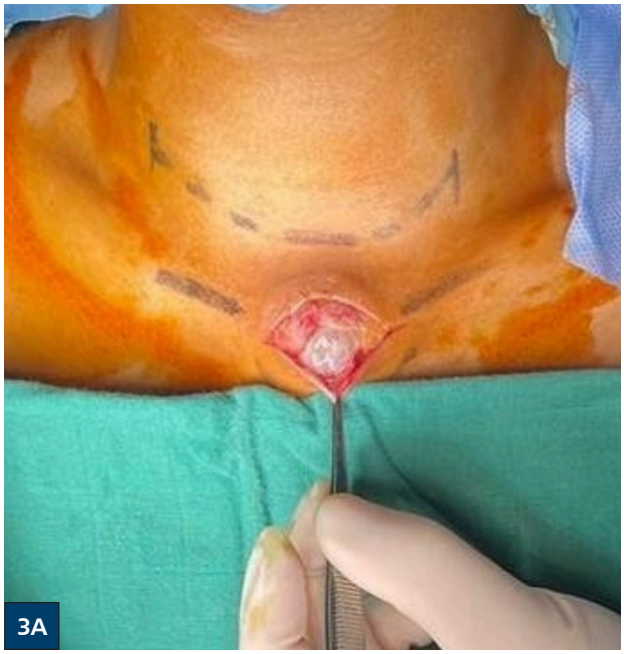
The postoperative course was uneventful. Histopathological examination of the specimen confirmed the diagnosis of a bronchogenic cyst, demonstrating a cyst wall lined by ciliated pseudostratified columnar (respiratory type) epithelium with underlying smooth muscle and mucous glands, consistent with the classical histological features of a bronchogenic cyst.[5]

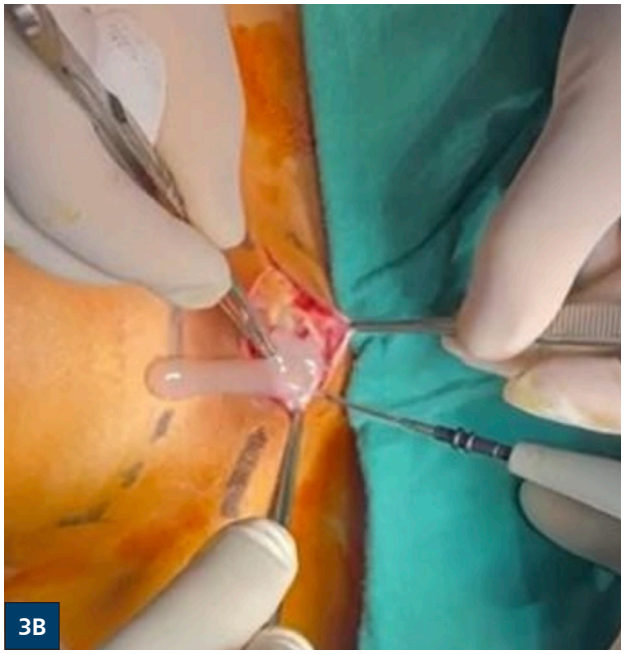
DISCUSSION

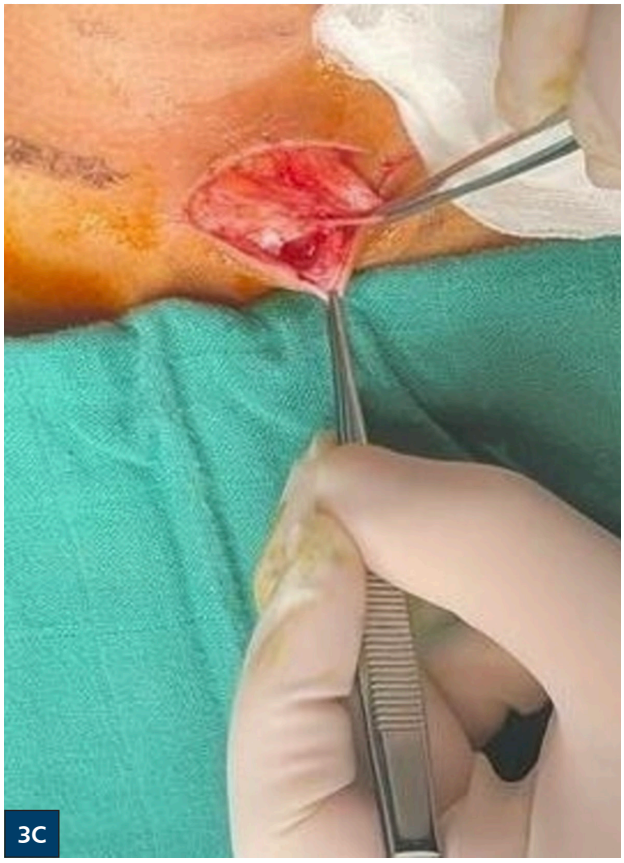
Bronchogenic cysts, first described by Meyer in 1859,[5] are congenital cystic malformations of the respiratory foregut, accounting for approximately 10–15% of mediastinal tumors and 50–60% of mediastinal cystic lesions.[5,6] Subcutaneous bronchogenic cysts are exceedingly rare; since the first description by Seybold and Clagett in 1945, fewer than 80 cases of cutaneous or subcutaneous bronchogenic cysts have been reported in the literature, with most cases diagnosed in early childhood.[4,7]

Clinical presentation is highly variable. Lesions may remain asymptomatic for years, as in our patient, or manifest as a local swelling, recurrent infection, discharge, or abscess. When located in deeper thoracic sites, compression symptoms including dysphagia, dyspnea, or superior vena cava syndrome may occur. Rare but serious complications include fistulization and malignant transformation.[8,9]

Preoperative diagnosis of presternal bronchogenic cysts is challenging because imaging findings are non-specific. Ultrasonography typically demonstrates a unilocular anechoic cystic mass. CT shows a well-defined, encapsulated, homogeneous, non-enhancing fluid-attenuation lesion, while MRI provides superior soft-tissue contrast, demonstrating high T2-weighted signal intensity due to mucinous and proteinaceous content, and allows precise delineation of the relationship with adjacent structures.[6,7] In our case, CT was misleading, and the radiologist initially favored a thyroglossal duct cyst—a common diagnostic pitfall in this location. The main differential diagnoses for presternal midline cystic







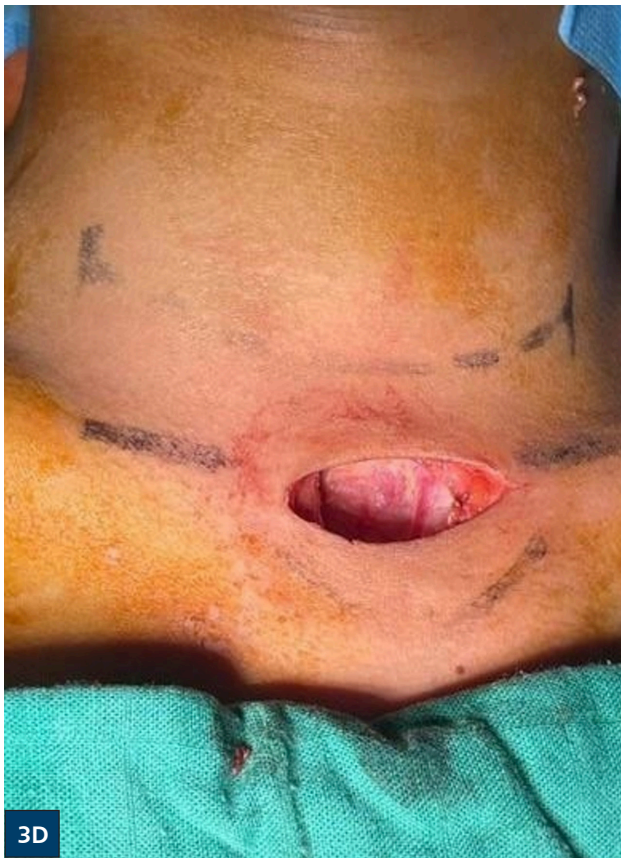


Figure 3

Preoperative pictures.
(A) White thin-walled glistening surface cyst in subcutaneous space
(B) Clear mucoid liquid resulting from accidental rupture of the cyst
(C) Cyst wall in cutaneous space
(D) Surgical view after the complete excision of the cyst

masses include thyroglossal duct cyst, epidermal inclusion cyst, sebaceous cyst, branchial cleft cyst, teratoma, and heterotopic salivary gland tissue.[7,10]

Histologically, bronchogenic cysts are characteristically lined by ciliated pseudostratified columnar respiratory epithelium and may contain cartilage, smooth muscle, mucous glands, or seromucinous material, differentiating them from thyroglossal duct cysts, which display thyroid follicular tissue.[10] Histopathological examination therefore remains indispensable for definitive diagnosis.

Complete surgical excision is the definitive treatment, providing both cure and histopathological confirmation. Needle aspiration is insufficient and should be discouraged: it does not remove the epithelial lining and invariably leads to recurrence, as illustrated in our case. Recurrence after complete excision is uncommon.[7,8]

CONCLUSION

Presternal subcutaneous bronchogenic cysts are rare ectopic congenital lesions that should be included in the differential diagnosis of anterior midline chest wall masses, particularly in children and adolescents. Preoperative diagnosis is often difficult, as imaging findings may mimic other cystic lesions. Complete surgical excision followed by histopathological examination remains the cornerstone of management and the only reliable means of preventing recurrence.

Conflict of interest

The authors declare no conflict of interest.

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