CLINICAL CASE

NOT EVERYTHING IS AS IT SEEMS: UNILOCULAR THYMIC MEDIASTINAL CYST, CLINICAL CASE REPORT

NO TODO ES LO QUE PARECE: QUISTE MEDIASTINAL TÍMICO UNILOCULAR, REPORTE DE CASO CLINICO

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RESUMEN:

Los quistes mediastínicos primarios son lesiones malformativas benignas que representan entre el 12% al 30% de las lesiones del mediastino dentro de los cuales los quistes tímicos son extremadamente raros. Estos quistes suelen ser hallazgos incidentales hasta que por sus características represente algún componente clínico patológico que suelen ser causa de estudio o preocupación por su semejanza son entidades malignas y benignas. Se presenta un caso clínico de un quiste mediastinal de localización superior y medio que ocupaba gran parte de la ventana intertraqueo cava y desplazaba estructuras adyacentes en una paciente en quien inicialmente se sospechó una lesión ocupante de espacio de origen tumoral. Se sometió a resección quirúrgica exitosa del quiste por toracoscopia. El estudio citológico reportó el contenido como liquido turbio, extendido hemorrágico con abundantes células de aspecto hemato linfoide, algunos de tipo polimorfonuclear neutrófilo y en la biopsia se evidenció tejido de consistencia cauchosa con pared del quiste con revestimiento focal de epitelio plano sin atipia que requirió inmunohistoquímica para clasificación

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definitiva cuyo diagnóstico anatomopatológico final consistió en un quiste tímico unilocular.

PALABRAS CLAVES: Quiste mediastínico, quiste broncogénico, Neoplasias del Mediastino

ABSTRACT:

Primary mediastinal cysts are benign malformative lesions that represent between 12% and 30% of mediastinal lesions within which thymic cysts are extremely rare. These cysts are usually incidental findings until due to their characteristics they represent some clinical-pathological component that is usually the cause of study or concern due to their similarity between malignant and benign entities. We present a clinical case of a mediastinal cyst located upper and middle that occupied a large part of the intertracheo cava window and displaced adjacent structures in a patient in whom a space-occupying lesion of tumor origin was initially suspected. She underwent successful surgical resection of the cyst by thoracoscopy. The cytological study reported the content as cloudy liquid, hemorrhagic spread with abundant cells with a hematolymphoid appearance, some of the polymorphonuclear neutrophil type and in the biopsy evidenced rubbery tissue with a cyst wall with a focal lining of squamous epithelium without atypia that required immunohistochemistry to definitive classification whose final anatomopathological diagnosis consisted of a unilocular thymic cyst.

KEY WORDS: Mediastinal Cyst, Bronchogenic Cyst, Mediastinal Neoplasms

INTRODUCTION:

Primary mediastinal cysts account for approximately 12% to 30% of mediastinal lesions. Their main etiology is congenital, with a smaller proportion acquired during life. These are malformative, benign lesions whose characteristics vary according to their tissue origin. Among the existing types, the most common are bronchogenic cysts (40%), pleuropericardial cysts (20%), enteric

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cysts (10%), and, less frequently, thymic and Müllerian cysts. (Syred, 2020; Cooley-Riders, 2022)

Clinical manifestations are highly varied, despite the fact that most cases are asymptomatic. The most typical symptom is pain, which is often retrosternal, radiating to the back or spine, and may present as erosive, neuralgic, or brachialgic in nature. Less common manifestations result from location and compression of venous return circulation, causing neck and facial edema, swelling, vein engorgement at the base of the tongue that worsens with talking, coughing, swallowing, or tilting the head and chest forward. Other rare and late signs include cyanosis and collateral circulation in the anterothoracic region, shoulders, and base of the neck. Respiratory symptoms may include dry cough and inspiratory-predominant dyspnea. Digestive symptoms are often attributable to esophageal compression, such as dysphagia, which is almost always late-onset, intermittent, and sometimes paradoxical. (Syred, 2020; Cooley-Riders, 2022; Keita, 2020)

Once a mediastinal lesion is suspected, computed tomography (CT) and magnetic resonance imaging (MRI) are used to evaluate its characteristics. On CT scans, mediastinal cysts appear as well-defined spherical lesions with aqueous content and low attenuation intensity. They are typically unilocular with thin walls, although they may occasionally present septations and wall thickening. Additionally, secondary inflammatory changes can lead to calcifications in the cyst walls. On MRI, mediastinal cysts usually exhibit low signal intensity on T1-weighted images and high signal intensity on T2-weighted images. (Park, 2021; Le Pimpec-Barthes, 2010; Hsu, 2022)

Surgical resection is indicated for patients whose symptoms correlate with the radiological findings of a mediastinal cyst, in cases of compression of adjacent structures or suspicion of malignancy. (Cooley-Riders, 2022; Park, 2021; Le Pimpec-Barthes, 2010)

Thymic and parathyroid cysts originate from the development of the third and fourth pharyngeal pouches before

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migrating ventrally and caudally behind the thyroid gland and sternocleidomastoid muscles. Radiologist Ronald Seltzer was the first to describe thymic cysts in 1968. During the embryonic period, the thymus arises from the third pharyngeal pouch during the sixth week of gestation and then descends, fusing at the midline to its proper position in the anterior thorax. During this process, ectopic thymic tissue can become implanted anywhere from the hyoid to the diaphragm, with anterior locations being the most common.

Thymic cysts can occur at any level from the base of the neck to the diaphragm and range in size from 1 to 18 cm in maximum dimension. They have a smooth external surface and a fibrous, thin, or thick compact wall. These cysts may be unilocular or multilocular, congenital, or acquired. Regarding their content, unilocular thymic cysts typically contain serous fluid, whereas multilocular cysts vary in content, ranging from clear and watery to turbid or hemorrhagic. Microscopically, the walls of unilocular thymic cysts are usually thin and lined with flat, cuboidal, columnar, or stratified squamous epithelium. In contrast, multilocular cysts are more complex, with florid inflammatory changes such as fibrosis, chronic inflammatory cell infiltrates, reactive lymphoid follicles, granulomas, and granulation tissue. These are lined by squamous or cuboidal to columnar epithelium without cytological atypia. (Syred, 2020; Cooley-Riders, 2022)

Congenital cysts tend to be unilocular, while inflammatory cysts are often multilocular, though this rule is not always consistent. It is important to note that multilocular cysts are more frequently associated with thymic neoplasms, mediastinal germ cell tumors, and lymphomas, making a careful evaluation of the lesion crucial to exclude these diagnoses. These types of cysts can cause compressive symptoms and may require surgical resection, as they can continue to grow and exacerbate such symptoms. Thoracotomy or sternotomy is the standard surgical approach, offering greater visibility and accessibility, especially for lesions near critical structures. However, these methods

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have disadvantages, including postoperative pain and prolonged hospital stays. Conversely, it has been demonstrated that video-assisted thoracoscopic surgery (VATS), whether three-port or uniport, is a safe and effective option for cysts in all three compartments of the mediastinum. The advantages of VATS include reduced pain, shorter hospital stays, and lower morbidity. (Park, 2021; Le Pimpec-Barthes, 2010; Hsu, 2022)

CLINICAL CASE:

A 55-year-old female patient with a history of exposure to biomass and chemicals presented to the emergency department with a clinical picture of chest pain lasting two days. The pain radiated to the interscapular region of the back and had an intensity of 8/10 on the analog pain scale. It worsened with inspiration, abrupt movements, or lifting objects. During admission, laboratory and complementary tests were performed, all of which were within normal parameters. However, the initial chest X-ray revealed thoracic opacity in the middle lobe of the right lung field and the anterior segment of the upper lobe. The cardiothoracic index and rib cage appeared normal. The findings were interpreted as a potential space-occupying lesion in the right lung, prompting a consultation with the thoracic surgery department.

As part of the evaluation for thoracic lesions, complementary imaging studies were requested, and infectious etiologies were ruled out. A simple and contrast-enhanced chest CT scan revealed findings compatible with a mediastinal cyst. The imaging showed a hyperdense formation occupying the superior and middle mediastinum, largely involving the intertracheal-caval window, with well-defined margins and dimensions of 81 x 81 x 75 mm. The lesion did not uptake intravenous iodinated contrast and exhibited fluid density, consistent with a mediastinal cyst (Figures 1 and 2). Thoracic MRI demonstrated a hypodense lesion on T1-weighted sequences and hyperintense on T2-weighted sequences. The lesion lacked hemorrhagic or proteinaceous content, showed no diffusion restriction foci, and did not enhance with contrast. It was located in the

anterior-middle mediastinum, displacing the superior vena cava laterally to the right and the innominate vein superiorly and anteriorly. Its dimensions were approximately 65 x 84 x 83 mm, with a volume of 235 cc. There was no evidence of intralesional fat content or septations, nor was there apparent communication with the tracheal tree, findings consistent with a benign-appearing cystic mass in the anterior-middle mediastinum. Given these findings, surgical management was recommended for mediastinal lesion resection via thoracoscopy following pre-anesthetic evaluation. A radiology-guided biopsy and pathological study were performed, with cytological findings confirming cystic content.

THERAPEUTIC MANAGEMENT

During the surgical procedure (Figure 3), a fibrobronchoscopic evaluation via an endotracheal tube was performed, revealing a tracheobronchial tree without endobronchial lesions or bleeding, and a supracarinal endotracheal tube. An incision was made in the eighth intercostal space along the mid-axillary line, dissecting through the layers to access the pleural cavity. A trocar and video camera were introduced, identifying the presence of a giant cystic lesion in the visceral mediastinum with a thin capsule, closely related to the cavo-azygos confluence. Pleural adhesions to the adjacent lung parenchyma and congestive parietal pleura were also observed. A parietal pleurectomy was performed to free the pleural and mediastinal structures. Subsequently, a mediastinal approach was made parallel to the lesion, where the cyst was drained and subsequently resected (Figure 3). The cyst content appeared yellowish in nature. During the dissection, the azygos vein ruptured, resulting in bleeding that required ligation and sectioning. Finally, a thoracoscopic intercostal block was performed, and a 32F chest tube was placed and connected to a pleural drainage system. On the first postoperative day, the patient experienced controlled thoracic pain and minimal drainage through the pleural system. By the third day, following favorable clinical evolution, the patient was discharged without complications and referred for

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interdisciplinary management with a thoracic wall rehabilitation team.

Three weeks later, the patient attended an outpatient follow-up with improved pain, no dyspnea or other issues, normal pulmonary function, and well-healed surgical wounds.

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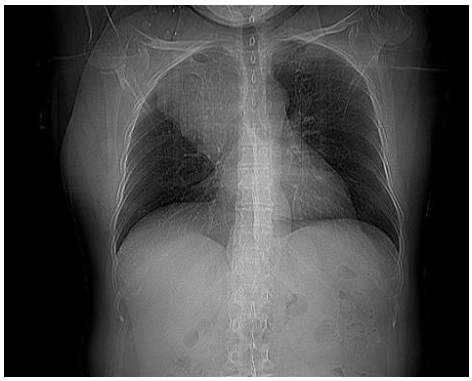

Figure 1. Preliminary view of chest computed tomography. Findings: chest opacity at the level of the upper and middle lobes of the right lung, normal cardiothoracic ratio, normal rib cage.

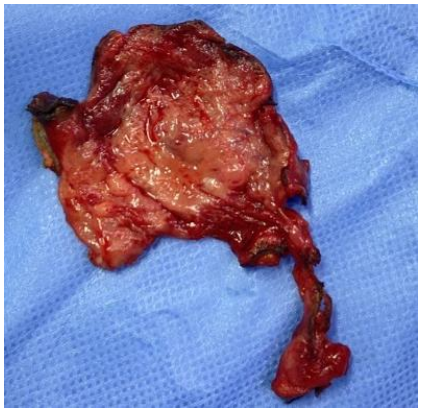

Figure 2. Coronal, sagittal, and axial cuts of chest computed tomography showing findings of a mediastinal mass with hyperdense formation occupying the upper and middle mediastinum, with a large part of the intertracheal-caval window, well-defined borders, dimensions of 81 x 81 x 75 mm, no iodinated intravenous contrast enhancement, and fluid density consistent with a mediastinal cyst.

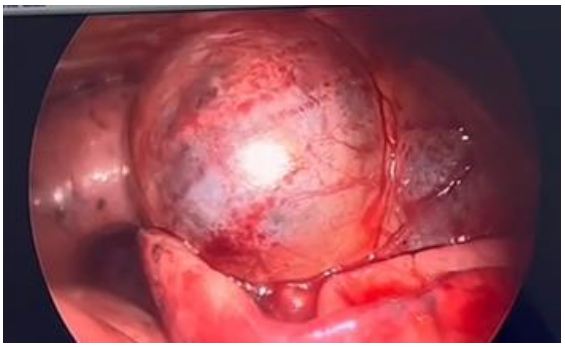

Figure 3. Right mediastinal cyst, displacing the pleura and phrenic nerve.

Figure 4. Surgical specimen of excised mediastinal cyst.

The pathological anatomy report of the lesion (Figure 4) consisted of: Cytological study: turbid fluid, approximately 40 cc. Hemorrhagic spread with abundant cells of hematolymphoid appearance, some of which were polymorphonuclear neutrophils and others of lymphoid appearance. Ziehl-Neelsen staining negative for acid-fast bacilli.

Biopsy: An irregular fragment of white tissue with a rubbery consistency

measuring 6 x 5 x 0.1 cm. Cyst wall with focal epithelial lining of flat cells without atypia, with adherent reactive lymphoid tissue that requires immunohistochemical staining for definitive classification. Immunohistochemistry required with CD34, CD31, D2-40, CALRETININ, CKAE1/AE3, and SMOOTH MUSCLE ACTIN.

Immunohistochemical study: Study of cyst wall fragments with epithelial lining without atypia, dense fibrocollagenous tissue with chronic lymphoid inflammation and presence of follicles. No presence of mitosis, necrosis, or atypia. In the complementary study, CD31, CD34, and D240 were reactive in the vascular structures. AML reactive in the lesion wall. Negative for CALRETININ and AE1/AE3.

Anatomopathological diagnosis: Unilocular thymic cyst.

CONCLUSIONS

Mediastinal cysts are rare entities that require extensive sampling and clinical suspicion to determine their benign or malignant origin. The radiological diagnosis through computed tomography and magnetic resonance imaging allowed for the identification of the classic cystic composition and the exclusion of other pathological entities. Surgical resection via thoracoscopy is the preferred treatment recommended in the literature due to its excellent long-term results with minimal morbidity and mortality.

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