

Minimally Invasive Management of Lesser Sac Bronchogenic Cyst

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ABSTRACT

Bronchogenic cysts rarely develop in the abdomen they typically reside in the mediastinum. We present a unique case of a bronchogenic cyst within the lesser sac. Endoscopic ultrasound proved to be a critical diagnostic tool, and the patient underwent a laparoscopic resection of the lesion.

Key Words: Bronchogenic cyst, Endoscopic ultrasound, Laparoscopy.

INTRODUCTION

Bronchogenic cysts are congenital anomalies of the tracheobronchial tree that are normally found within the mediastinum. They rarely develop inferior to the diaphragm, in either a retroperitoneal or intraperitoneal location. We report a case of an intraperitoneal paraesophageal bronchogenic cyst within the lesser sac. This cyst was diagnosed by endoscopic ultrasound and aspiration, and it was successfully treated with laparoscopic resection.

CASE REPORT

A 33-year-old man presented with a 9-month history of intermittent epigastric and right upper quadrant pain and burning, and a pressure sensation like “a ball” within the abdomen. His past medical history was significant for recurrent spontaneous pneumothoraces, requiring pleurodesis and resulting in chronic chest wall pain and narcotic requirements. Clinical examination did not reveal any palpable masses but was significant for mild to moderate tenderness of the deep epigastrium. Laboratory values, including liver chemistries, were normal. Ultrasonography suggested a 4.3cm x 1.7cm echogenic lesion in the caudate lobe of the liver, consistent with either a hemorrhagic cyst or thrombosed vascular structure. Magnetic resonance imaging (MRI) demonstrated a 4.5cm x 1.7cm ovoid, well-circumscribed lesion abutting the caudate lobe of the liver and the proximal stomach near the gastroesophageal junction (**Figure 1**). There was no air fluid level to suggest communication with the gastrointestinal tract.

Endoscopic ultrasound (EUS) revealed a large cystic structure without internal nodules or masses adjacent to the liver and proximal stomach in the lesser sac. The aspirate was a thick, turbid, mucus-like material. Its cytology included squamous cells, ciliated glandular cells, and clusters of foam cells, all consistent with a bronchogenic cyst.

The abdomen was explored with a 30-degree laparoscope. Upon evaluation of the lesser sac, we discovered a 6cm x 3cm thick-walled cyst superior to the celiac axis. Its fibrous and areolar attachments were divided with a Harmonic scalpel and electrocautery, and the oblong cyst was

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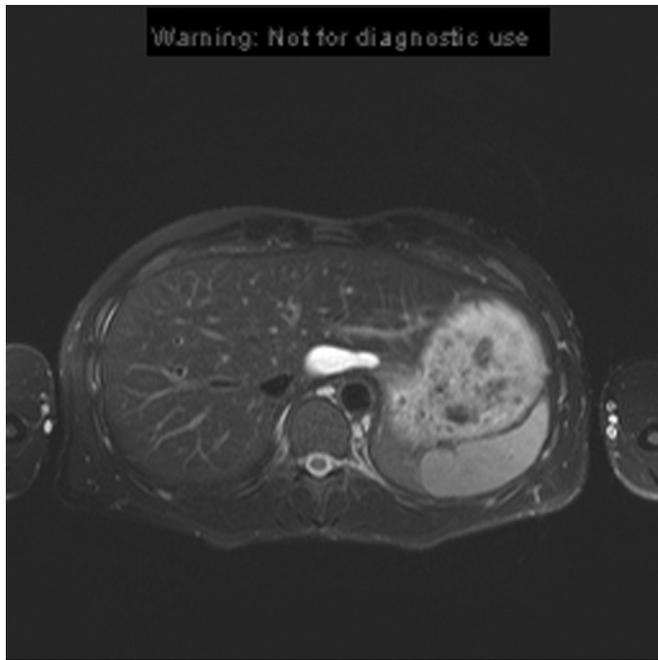


Figure 1. MRI showing bronchogenic cyst at gastroesophageal junction (Axial T2 GRASE (gradient and spin echo) with fat suppression).

removed intact and in its entirety. The cyst was not contiguous with the adjacent viscera, including the gut, nor was there any adjacent pathology. The patient was discharged home a few hours later, and his preoperative abdominal symptoms resolved, although he continues to experience chronic chest wall pain. Histology of the cyst revealed respiratory epithelium with a chronic lymphocytic infiltrate lining a smooth muscle wall, consistent with a bronchogenic cyst.

DISCUSSION

Bronchogenic cysts are rare congenital anomalies of the ventral foregut that arise from abnormal budding of the tracheobronchial tree during the fifth week of fetal development.^{1,2} They are typically found in the mediastinum in presternal, pulmonary, or pericardial areas,³⁻⁵ but there have been infrequent reports of bronchogenic cysts being discovered inferior to the diaphragm. The most common site of these abdominal cysts is in the retroperitoneum, and they are often thought to be adrenal masses.⁶⁻⁸

The location of a bronchogenic cyst inferior to the diaphragm is attributable to the fact that, until the sixth week of development, the pleuroperitoneal membrane and embryonic diaphragm have not yet fused. Consequently, abnormal tracheobronchial buds can be isolated by the

growing diaphragm and migrate into the abdomen.⁵ Bronchogenic cysts are composed of smooth muscle, cartilage, and glands lined with ciliated columnar epithelium.^{6,9} This is in contrast to esophageal duplication cysts that have 2 smooth muscle layers, as does the esophagus.^{9,10}

A literature review yielded over 40 reported cases of intraabdominal bronchogenic cysts, of which 13 were truly intraperitoneal.^{11,12} Most intraperitoneal bronchogenic cysts are associated with the stomach, diaphragm, pancreas, or gallbladder.^{5,7,12-14} There are only 2 other reports of adults with intraperitoneal paraesophageal bronchogenic cysts, both of which were immediately adjacent to the gastroesophageal junction, and apparently not within the lesser sac.^{15,16} Only one other intraperitoneal paraesophageal bronchogenic cyst has been reported within the lesser sac, and that was in a 10-year-old boy.¹⁷

Intraabdominal bronchogenic cysts are often asymptomatic and discovered incidentally.^{6,18} When symptoms are present, as in our case, they may be nonspecific, such as intermittent discomfort or epigastric pressure. The symptoms may be due to cyst expansion and compression of adjacent viscera, rupture, or secondary infection.^{6,17,19,20} When imaging reveals an upper-abdominal cyst, the differential diagnosis is a function of the cyst's location and the patient's age. A differential diagnosis for adults includes cystic lesions of the liver, pancreas, or spleen; gastrointestinal stromal tumor (GIST); teratoma; dermoid cyst; lipoma; adrenal tumor; paraganglioma; pheochromocytoma; lymphangioma; mesothelioma; hemangioma; lymphoma; dermoid cyst; gastrointestinal (eg, esophageal) duplication cyst; bronchogenic cyst; leiomyoma; neurofibromas; hematoma; abscess; or cystic degeneration of a neoplasm.^{6,17,18,20} Pediatric patients could have many of the same diagnoses, but the diagnoses in children are likely to be dermoid cysts, teratomas, adrenal tumors, duplication cysts, bronchogenic, or other cysts originating from foregut and urogenital malformations, or neuroblastoma/ganglioneuroblastoma.^{17,18}

Computed tomography (CT) and MRI are frequently used in the assessment of an abdominal mass. However, these modalities have limitations with bronchogenic cysts.⁶ With CT, bronchogenic cysts may appear to be hyperdense, due to the thick proteinaceous fluid contents, suggesting a calcified solid mass.²⁰ An MRI scan may reveal a cystic pattern, when long T1 and T2 signals are present.^{6,20,21} However, it may be difficult to determine the origin of the lesion and whether it is adherent to or intrinsic to an intraabdominal organ such as the liver or pancreas.²¹

Endoscopic ultrasound (EUS) has enhanced the assessment of pancreatobiliary diseases and gastrointestinal malignancies, and it also permits aspiration for cytology.^{22,23} Endoscopic fine needle aspiration secured a diagnosis of a bronchogenic cyst in our case. Furthermore, the absence of 2 muscle layers offered us assurance that the patient did not have an esophageal duplication cyst that might have required a more elaborate, and perhaps open, operation. To the best of our knowledge, EUS has been reported in the diagnosis of a bronchogenic cyst just once before our case, and that was done without aspiration. This diagnostic option is available to both adults and children, although general anesthesia may be necessary for younger patients.²⁴

The treatment of bronchogenic cysts is surgical resection. Removal of the cyst will most likely alleviate symptoms and avoid complications, such as infection, rupture, or compression of adjacent viscera, as well as the rare but dangerous possibility of malignant transformation.^{25–28} Moreover, once the cyst is removed, a definitive diagnosis is established.

CONCLUSION

Bronchogenic cysts rarely develop in the abdomen, but they should be entertained in the differential diagnosis of lesser sac cystic lesions. Endoscopic ultrasound with aspiration is a valuable diagnostic adjunct that can determine the nature, location, and histology of the cyst, and whether it may be amenable to laparoscopic resection. The majority of intraabdominal bronchogenic cysts reside in the retroperitoneum, and many of those can be resected with minimally invasive techniques similar to the treatment of those found within the peritoneal cavity. To our knowledge, this is the second reported case of a lesser sac bronchogenic cyst being laparoscopically resected, and the first such case described in adults.

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