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Duodenal Duplication Cyst in a Newborn: A Case Report and Literature Review

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Abstract **Case Report**

Duodenal duplication cysts are congenital gastrointestinal anomalies characterized by a cystic structure contiguous with the duodenum and lined by gastrointestinal epithelium, often sharing a common muscular wall. Ultrasonography is the first line imaging modality, demonstrating a well circumscribed cyst with a double layered wall, consisting of an echogenic mucosal layer and a hypoechoic muscular layer, sometimes containing fine echogenic debris. Computed tomography provides complementary evaluation, delineating cyst wall thickness, anatomical relationships with the duodenum and adjacent organs, mass effect, and associated pericystic fluid. These imaging features are pathognomonic and crucial for differentiating duplication cysts from other cystic abdominal lesions. We report the case of an 11-day old female neonate presenting with an epigastric and right paramedian abdominal mass, in whom ultrasonography established the diagnosis of a duodenal duplication cyst.

Keywords: Duodenal duplication cysts, Abdominal ultrasound.

INTRODUCTION

Duodenal duplication cysts are congenital anomalies characterized by the presence of a cystic structure contiguous with the duodenum and lined by gastrointestinal epithelium, often sharing a common muscular wall [1]. These lesions are usually asymptomatic in early life but may present with nonspecific gastrointestinal symptoms such as abdominal pain, vomiting, or jaundice, depending on their size and location [2]. The diagnosis is primarily based on imaging studies, with ultrasound serving as the first line modality for initial detection [3]. Computed tomography (CT) and magnetic resonance imaging (MRI) provide detailed characterization, allowing precise assessment of the cyst's size, wall structure, relation to adjacent organs, and presence of complications [4,5].

PATIENT AND OBSERVATION

We report the case of an 11day old female neonate, without significant past medical history, who was admitted to the pediatric surgery department for evaluation of an abdominal mass in the epigastric and right hypochondrial regions, associated with non-bilious vomiting, without disturbances of bowel movements or fever.

Abdominal ultrasonography, performed as part of the etiological workup, demonstrated a well-circumscribed, rounded cystic lesion located in the mid-epigastrium and right paramedian region, medial to the duodenum. The lesion exhibited an echogenic inner layer corresponding to mucosa and a hypoechoic outer layer continuous with the duodenal muscular wall. It contained finely echogenic mobile material and measured 6 × 5.45 cm, associated with a small adjacent anechoic fluid collection. These imaging features were consistent with a gastrointestinal tract duplication cyst of duodenal origin.

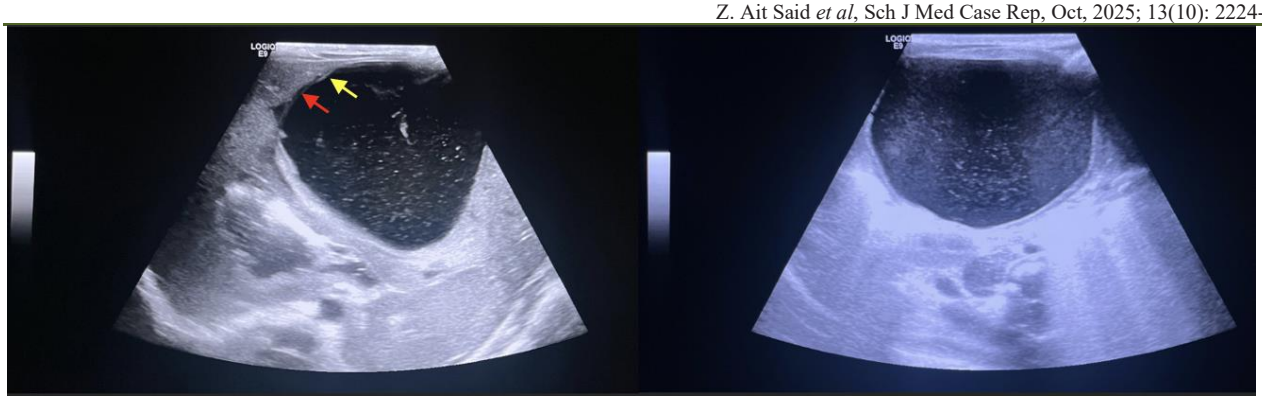

Figure 1: Echographic image showing an abdominal cystic formation, roughly rounded in shape, well defined, located in the median epigastric region and right paramedian, medial to the duodenum. The image reveals an internal echogenic layer (mucosa) (yellow arrow), and an external hypoechoic layer, continuous with that of the duodenum (muscular layer) (red arrow). The content appears finely echogenic and mobile, consistent with a duodenal duplication cyst

DISCUSSION

Duodenal duplication cysts are congenital anomalies, accounting for less than 5% of all gastrointestinal duplications [6,7]. They are more frequently diagnosed in the pediatric population, with a slight male predominance, though cases can occur in both sexes [8]. These cysts may be asymptomatic at birth or present with nonspecific symptoms such as vomiting, abdominal distension, feeding intolerance, or jaundice, depending on their size, location, and potential complications [9].

The pathogenesis of duodenal duplication cysts remains incompletely understood. Two main hypotheses have been proposed: the aberrant recanalization theory, suggesting failure of normal intestinal lumen recanalization during embryogenesis, and the split notochord theory, which accounts for cysts associated with vertebral anomalies [10,11]. Local anatomical factors, including proximity to the pancreaticobiliary ducts and duodenal lumen, may predispose to cyst enlargement and obstruction, while associated congenital anomalies may influence clinical presentation [12].

Imaging plays a central role in the diagnosis and management of duodenal duplication cysts. Ultrasound is typically the first line modality and can demonstrate a well circumscribed cystic lesion with a characteristic double layered wall: an inner echogenic layer representing mucosa and an outer hypoechoic layer corresponding to muscularis propria [13]. The internal content may be anechoic or contain fine echogenic debris. Ultrasound also allows assessment of cyst size, location relative to the duodenum, and presence of adjacent fluid collections or mass effect on neighboring structures.

Computed tomography provides complementary information, particularly in complex or large cysts. CT delineates cyst wall thickness, internal density, relationship to surrounding organs, and potential compression of the pancreaticobiliary system. It can identify complications such as obstruction, hemorrhage, or pancreatitis [14]. Magnetic resonance imaging, although less frequently used, offers superior soft tissue contrast and multiplanar assessment, facilitating preoperative planning and differentiation from other cystic abdominal lesions [15].

Imaging also plays a key role in differentiating duplication cysts from other cystic abdominal masses, including mesenteric cysts, choledochal cysts, pancreatic pseudocysts, and enteric cystic neoplasms. Features favoring a duplication cyst include contiguity with the gastrointestinal tract, a double layered wall, and the presence of peristaltic or motile contents [16].

Management is surgical, with complete excision being the treatment of choice to prevent complications and potential malignant transformation. Imaging findings guide the surgical approach, helping determine whether simple cyst excision, segmental bowel resection, or mucosal stripping is indicated [17,18]. Early diagnosis and timely surgical intervention generally result in excellent outcomes [19].

CONCLUSION

Duodenal duplication cysts, though rare, are significant congenital anomalies primarily diagnosed through imaging. Ultrasound, as the first line of investigation, reveals a characteristic cystic lesion with a double layered wall, while CT and MRI provide detailed information on size, relationship to adjacent structures, and potential complications. Early diagnosis and appropriate surgical intervention are crucial to avoid severe complications. The specific radiological features help differentiate these cysts from other abdominal masses and guide clinical management.

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