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Case Report

Duodenal Duplication Cyst in an Adult: First Simultaneous Laparoscopic and Endoscopic Surgery

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Abstract

Duodenal duplication cysts are rare congenital anomalies. The symptoms may appear during the neonatal period or later in life, depending on the degree of gastrointestinal outlet obstruction. Classically, symptomatic cases have been treated by surgical resection or endoscopic marsupialization of the cyst. In this paper, we describe a new method of total laparoscopic resection and defect closure after precise localization of the lesion by simultaneous gastrointestinal endoscopy in a 24-year-old woman.

Introduction

ALIMENTARY TRACT DUPLICATIONS are unusual anomalies. They may be found at any level from the mouth to the anus, and they are usually intimately attached to some portion of the gastrointestinal tract. The small intestine, large intestine, and esophagus are the sites most commonly affected.[1] The prevalence of gastrointestinal duplications is 1:4500 to 1:10,000 in the general population. Duodenal duplication cyts are extremely rare and constitute 5–7% of gastrointestinal duplications.[1] The clinical presentation of patients with alimentary tract duplications includes gastrointestinal bleeding from heterotopic gastric mucosa, abdominal pain, intestinal obstruction and palpable mass, intussusception, jaundice, pancreatitis, or it may be an incidental finding.

Case Report

A 24-year-old woman presented with intermittent upper abdominal discomfort accompanied by early satiety and occasional postprandial vomiting. Her past medical history was unremarkable. There was no history of jaundice, weight loss, or diarrhea. Physical examination and laboratory data were all within normal limits. Barium meal showed an extrinsic mass indenting the medial aspect of the duodenum (Fig. 1). Abdominal computed tomography (CT) revealed a hypodense, nonhenancing cystic mass measuring $2.7 \times 3.7 \times 6$ cm, located between the head of the pancreas and the duodenum. No lymphadenopathy, ascites, or liver metastases were found (Fig. 2). A magnetic resonance cholangiopancreatography (MRCP) scan revealed the cyst to be lateral to the confluence of the common bile duct and pancreatic duct without dilatation (Fig. 3).

With all these findings, the diagnosis of a duodenal duplication cyst was made, and a surgical resection was proposed to the patient. Because the traditional surgery for this kind of lesion is a very aggressive surgery, our patient agreed to a new approach, using simultaneous endoscopic and laparoscopic surgery, which is less invasive than the other option.

Because of the difficulty of localizing this kind of lesion using a laparoscopic approach without the possibility of finding it by touching the duodenum, the patient underwent a laparoscopic resection of the cyst after precise localization, using simultaneous laparoscopy and duodenoscopy. A laparoscopic operation under general anesthesia was undertaken, with the patient in the supine position and with the legs abducted. No macroscopic peritoneal seedling was found. A laparoscopic Kocher maneuver was performed. The retroperitoneum was entered by using the Ethicon Harmonic Scalpel G110 (Ethicon Endo-Surgery, Brussels, Belgium), and the dissection extended beyond the vena cava and the duodenum. An upper gastrointestinal endoscopic examination

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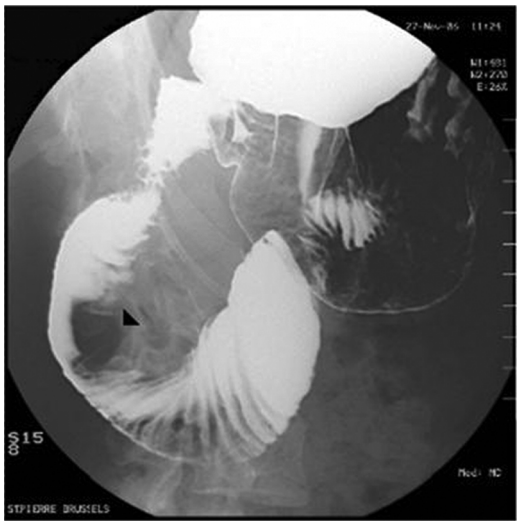

FIG. 1. Barium meal: extrinsic mass indenting the second portion of the duodenum

revealed a submucosal mass in the second part of the duodenum, like a prominent lesion in the wall with normal appearing overlying mucosa (Fig. 4), and the precise localization was made by using transillumination though the duodenal wall (Fig. 5).

FIG. 2. Abdominal CT: hipodense mass (white arrow) measuring 2′7 × 3′7 × 6 cm between the head of the pancreas and the duodenum (black arrow).

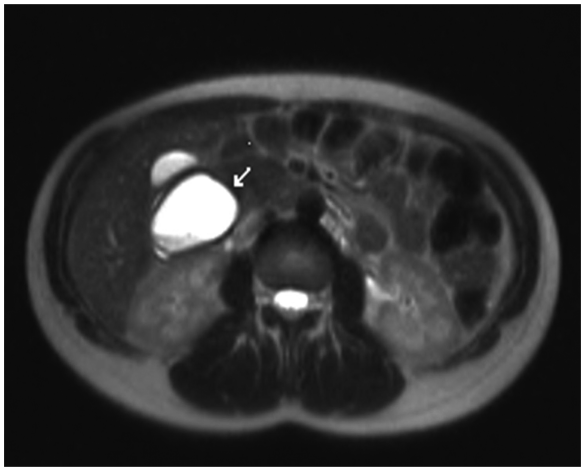

FIG. 3. MR cholangiopancreatography: duodenal duplication cyst (white arrow).

The excision of the lesion was performed by a duodenotomy in the anterior wall of the duodenum by using the Harmonic Scalpel (Figs. 6 and 7). Then, the reconstruction of the duodenotomy defect was performed by using intracorporeal suturing techniques. The resected lesion was then placed in a retrieval bag and extracted through the port incision. Operating time was 75 minutes and blood loss was 20 mL. The postoperative course of the patient was uneventful. The recurrent abdominal pain disappeared after the procedure, and our patient remained asymptomatic during the entire follow-up period (1 year). A histopathologic examination of the excised cyst indicated it to be a duodenal duplication cyst. There was no evidence of dysplasia or malignancy.

Discussion

A duplication cyst is a congenital anomaly acquired during the digestive system's embryonic development. They are

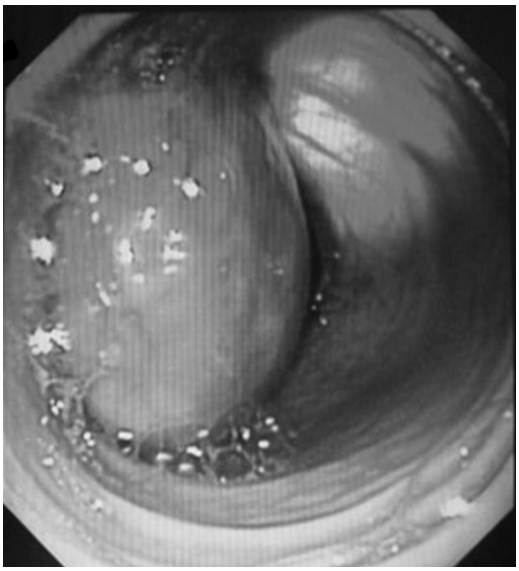

FIG. 4. Gastrointestinal endoscopy: prominent lesion in the wall with normal appearing overlying mucosa.

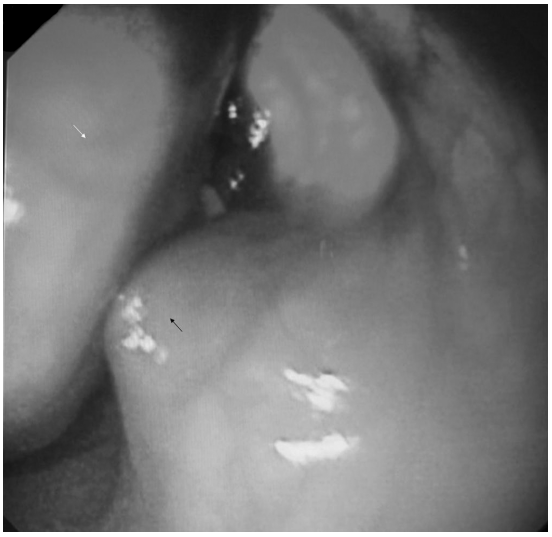

FIG. 5. Localization of the lesion: duodenal duplication (white arrow) endoluminal protuberance of the atraumatic grasper (black arrow).

structures with an internal lining of gastrointestinal epithelium, smooth muscle in its wall, and adherence to some portion of the alimentary tract. The most commonly affected site is the small intestine (47% of all cases), followed, in order, by the large intestine (20%), esophagus (17%), stomach (8%), and duodenum (5%).[1]

The origin of duplications is uncertain. In 1944, Bremer suggested that duplications were the result of errors of canalization. Because the stomach lumen does not go through a period of occlusion and recanalization, he suggested the adherence of longitudinal folds.[2] McLetchie's theory of a neurenteric band is based on the observation that during the third week of life, the primitive gut is developing and anomalies may occur in the separation of the notochord, resulting in a diverticulum of the foregut.[3]

FIG. 6. Duodenotomy in the anterior wall of the duodenum. Vision of the duplication cyst through the duodenal hole.

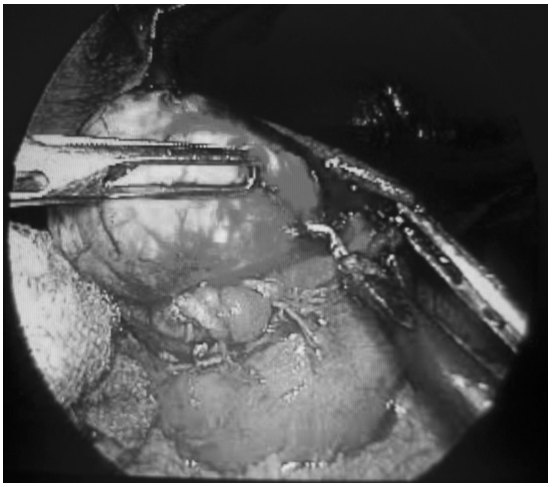

FIG. 7. Excision of the lesion using monopolar hook.

Macroscopically, they are spherical cysts or tubular structures located in, or immediately adjacent to, part of the gastrointestinal tract. Microscopically, alimentary tract duplications contain smooth muscle in their walls and are lined with alimentary tract mucosa. The lining mucosa, however, is not necessarily that of the adjacent segment of the gastrointestinal tract. Ectopic tissue, such as gastric, squamous, transitional, and ciliated mucosa, pancreas, and ganglion cells, can be found in its wall. Malignant change is a rare complication of alimentary tract duplications in adults, and to our knowledge, only 30 cases have been reported in the English-language literature. Histologically, these cases consisted of 21 adenocarcinomas, 4-squamous cell carcinomas, and 5 carcinoid tumors.[4]

As are generally found in large cysts of various organs with a chronic course, past hemorrhagic changes with chronic inflammation in the cyst, which consisted of lymphohistiocytic infiltration, were present in this case. These changes are probably associated with events raising intracystic pressure, such as an increase of intracystic materials and outer compression, mechanically injuring the cyst wall, or the inner surface of the cyst being exposed persistently to stimuli that are aberrantly secreted and held in the cyst. The environment inside a closed duplication cyst may also provide conditions that are favorable for the initiation of tumorigenesis, because the development of several kinds of tumors in various organs is accelerated in an environment with chronic inflammation and persistent stimuli.[5]

Duodenal duplications of a cyst is diagnosed more often in children. Presentation in adults is uncommon, and this entity is not normally considered in the differential diagnosis of cystic lesions of this area. In 20% of the cases, it communicates with the gastrointestinal tract through a single opening or through a proximal and distal opening. Most the duodenal duplications occur in the second portion of the duodenum along the posterior-medial wall. The mucosa is usually duodenal, but in 15% of the cases, there is gastric mucosa, and, very rarely, pancreatic tissue is found. The symptomatology may vary. Duodenal obstruction caused during the first days of life by a duodenal duplication cyst may resemble hypertrophic stenosis of the pylorus. In adult patients, however, this

anomaly may cause biliary obstruction, gastrointestinal bleeding, pancreatitis, or an acute abdomen.

Management may be based on the age and general condition of the patient, the location of the lesion, whether it was cystic or tubular and communicating with the true intestinal lumen, and whether it involved one or more anatomic locations. The need to treat a duplication cyst is unclear in patients who are asymptomatic or who have mild dyspeptic symptoms. However, because 30 cases of malignancy arising from gastrointestinal duplications have been reported, an invasive therapeutic approach with total resection is reasonable. Treatment has classically involved surgical resection, which can be complex because of the close proximity of the cysts to the papilla and the biliopancreatic confluence. Cyst excision with or without a Roux-en-Y pancreaticojejunostomy or a Roux-en-Y cystojejunostomy are commonly cited as surgical options.

Endoscopic therapy has been used as an alternative to surgery in a few selected cases.[6] The role of endoscopy was first described in 1984, when it was used to diagnose the cause of a duodenal obstruction in a patient who was treated by transduodenal excision of a duplication cyst.[7] In this way, endoscopic drainage of a symptomatic duplication is easily accessible and snare resection provides a better specimen than biopsy specimens for histologic confirmation of the diagnosis, but a total excision of the cyst is not possible with this approach, and compared with surgical resection, endoscopic therapy does not result in the complete ablation of the cyst mucosa, with the risk of malignancy in these cases. Laparoscopic surgery is less invasive, compared with conventional open surgery, and a total resection of the cyst can be performed.

Conclusion

In conclusion, laparoscopic resection could be an appropriate minimally invasive treatment for selected gastrointestinal duplications and may be a valid alternative to open surgery.

Disclosure Statement

No competing financial interests exist.

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