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Surgical Management of Symptomatic Intraluminal Duodenal Diverticulum in an Adolescent

Vivian Lam Saavedra

Timothy D. Kane
George Washington University

Stefany Garrity

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Brief Report

Surgical Management of Symptomatic Intraluminal Duodenal Diverticulum in an Adolescent

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Vivian Lam Saavedra, MD[1,2], Timothy Dennis Kane, MD, FACS[3,4], and Stefany Honigbaum Garrity, MD[5,6]

Case Report

A 17-year-old female presented to clinic with several months of dull, typically postprandial left upper quadrant abdominal pain associated with bloating and nausea. The pain occurred near daily and self-resolved. She denied loss of appetite but had lost 5 pounds in the past 6 months. Bowel movements were soft and occurring every 1 to 3 days. Her past medical history was notable for history of prematurity at 33 weeks gestational age and history of appendectomy several years prior. Her mother passed away of alcohol-induced liver failure but there was no other family history of gastrointestinal disorders.

Physical examination at initial presentation demonstrated a well-developed, well-nourished girl in no acute distress. Vital signs were normal. The abdomen was soft and nondistended with pain present on palpation to the left of the umbilicus. Laboratory investigation showed normal complete blood count, comprehensive metabolic panel, C-reactive protein, erythrocyte sedimentation rate, celiac panel, and stool studies. An abdominal X-ray showed mild increased stool burden. A small intestine bacterial overgrowth (SIBO) breath test was borderline positive. The patient was treated for both presumed SIBO as well as constipation.

Three months later, the patient returned with no improvement in her previous symptom despite adherence to laxatives and SIBO treatment. She now also endorsed new symptoms of heartburn. She was started on a 2-week trial of proton pump inhibitor therapy without improvement. An upper endoscopy was then performed, which showed a large intraluminal duodenal diverticulum (Figures 1 and 2). Biopsies in the duodenum, stomach, and esophagus were normal. Computed tomography scan of the abdomen was done to evaluate for presence of other diverticulum and this confirmed just one exophytic diverticulum in the third portion of the duodenum (Figure 3).

Procedure

The patient was sent for laparoscopic duodenal diverticulectomy. The patient was placed in a supine position for the operation. Four trocars were utilized: one 12-mm trocar in the umbilicus; two 5-mm trocars in the right upper abdomen; and one 5-mm trocar in the left mid-abdomen. The right colon and hepatic flexure of the transverse colon were mobilized to expose the duodenum. The diverticulum was located posteriorly emanating from the third portion of the duodenum. Once the duodenum was mobilized, the diverticulum was completely exposed and resected using an Endostapler (Ethicon, Cincinnati, OH). The operation lasted 100 minutes, and the patient was discharged home on postoperative day 1. In follow-up, her previously described symptoms had completely resolved. The final pathology revealed a 3 cm × 1.5 cm "small intestine lined structure" with focal mucous gland hyperplasia.

Discussion

Intraluminal duodenal diverticulum (IDD) is typically a diagnosis made in adulthood with the median age of diagnosis being between the ages of 30 and 39 years.[1] The diagnosis of IDD is rarely made in pediatrics despite being considered to be of congenital etiology, likely secondary to most cases being largely asymptomatic until

[1]Georgetown University, Washington, DC, USA
[2]Children's Hospital Los Angeles, CA, USA
[3]George Washington University, Washington, DC, USA
[4]Children's National Medical Center, Washington, DC, USA
[5]Pediatric Specialists of Virginia, Fairfax, VA, USA
[6]Inova Children's Hospital, Fairfax, VA, USA

Corresponding Author:
Stefany Honigbaum Garrity, Pediatric Specialists of Virginia, 3023 Hamaker Court, Fairfax, VA 22031, USA.
Email: sgarrity@psvcare.org

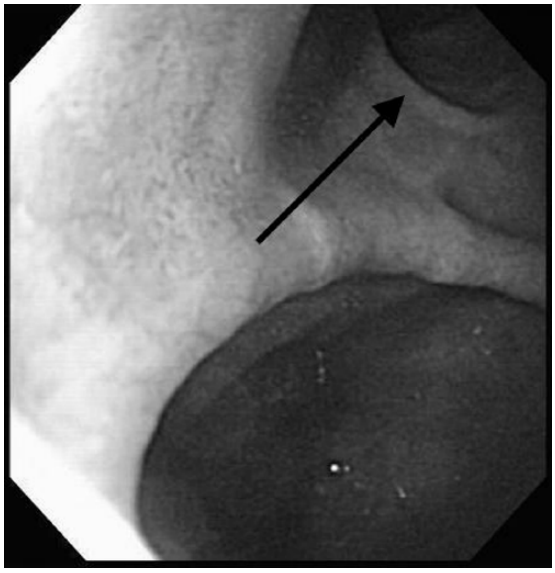

Figure 1. Endoscopic view of the duodenal diverticulum as indicated by black arrow.

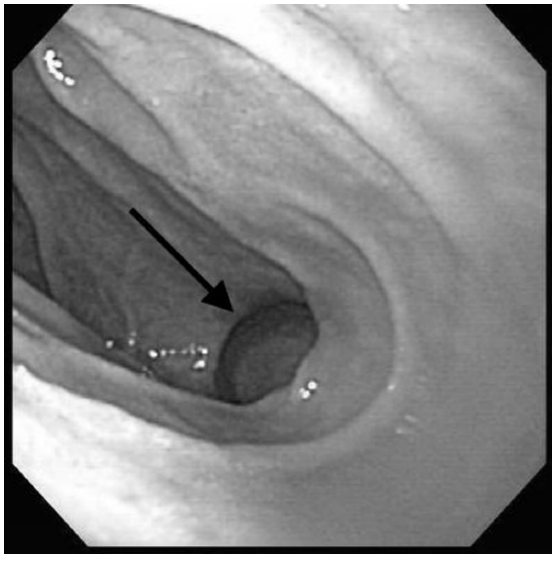

Figure 2. Endoscopic view of the duodenal diverticulum as indicated by black arrow.

later in life. Pediatric literature on the subject is scarce, especially with regard to management.

IDD is thought to occur as a result of improper vacuolization and recanalization of the duodenum between the fourth and eighth weeks gestation. The resulting

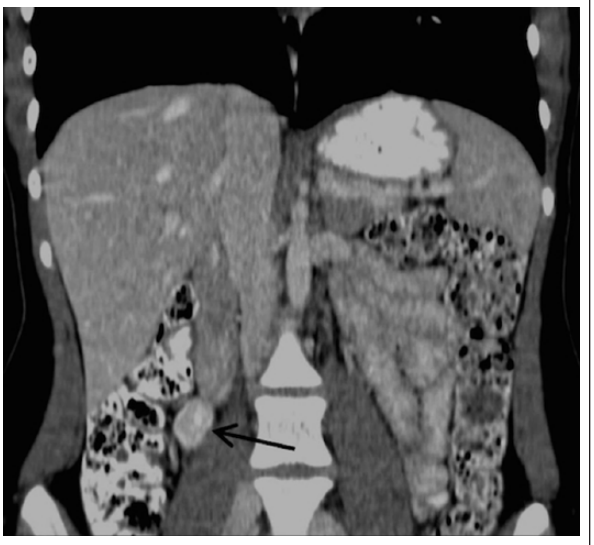

Figure 3. Computed tomography (CT) scan of the abdomen showing single exophytic diverticulum in the third portion of the duodenum as indicated by black arrow.

mucosal web can expand into a diverticulum 3 to 4 times its original size because of a lack of innervation and peristaltic waves.[2,3] Therefore, it is thought that IDD begins initially as a congenital abnormality that develops over time into a larger mucosal insult as a result of intestinal peristalsis.[1] The distended diverticulum is thought to cause intermittent obstruction of the lumen, contributing to many of the common symptoms associated with this finding.[2,3]

Despite its rarity in pediatrics, IDD is actually thought to be quite common in adults with a reported frequency as high as 22% at time of autopsy but with less than 10% of duodenal diverticula actually causing symptoms and 1% requiring definitive treatment.[4,5] When symptoms do occur, they are typically nonspecific symptoms of chronic epigastric pain, obstructive symptoms, nausea, vomiting, and gastrointestinal bleeding.[1]

The first documented case in childhood was thought to be in 1968 with the child complaining of a cramping abdominal pain without emesis, which was likely related to intermittent obstruction given its resolution with symptomatic treatment.[6] Since then, very few additional symptomatic childhood cases of IDD have been reported in the literature. Other cases of symptomatic IDD were discovered under similar circumstances related to obstruction: (1) obstruction from ingestion of a foreign body in conjunction with a diverticulum[7] and (2) obstruction causing secondary acute pancreatitis.[8]

No definitive management or treatment strategy has yet been established for IDD in children. Surgical repair is considered the definitive treatment for symptomatic IDD in adults given high recurrence with conservative treatment[9] and is therefore considered a reasonable treatment option in children. Of the previous case reports of pediatric IDD, 3 improved with surgical repair of the defect[7,8,10] whereas one improved with symptomatic treatment.[6] We presented above another pediatric case where surgical repair of IDD resulted in successful treatment of symptoms.

Author Contributions

VLS: Contributed to conception and design; contributed to analysis and interpretation; drafted the manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.
TDK: Contributed to acquisition and analysis; drafted the manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.
SHG: Contributed to conception; contributed to acquisition, analysis, and interpretation; critically revised the manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

Declaration of Conflicting Interests

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References

1. Meinke AK, Meighan DM, Meinke ME, Mirza N, Parris TM, Meinke RK. Intraluminal duodenal diverticula: collective review with report of a laparoscopic excision. *J Laparoendosc Adv Surg Tech A*. 2013;23:129-136.
2. Grande L, Latre ML, de Lacy AM, Pera M, et al. Intraluminal diverticulum of the duodenum: report of 3 cases and review of the literature. *Dig Surg*. 1988;5:47-52.
3. Huang FC, Chuang JH, Ko SF. Intraluminal duodenal diverticulum presenting as obstructive chronic pancreatitis. *J Pediatr Gastroenterol Nutr*. 1998;27:593-595.
4. Balkissoon J, Balkissoon B, Leffall LD Jr, Posey DA Jr. Massive upper gastrointestinal bleeding in a patient with a duodenal diverticulum: a case report and review of the literature. *J Natl Med Assoc*. 1992;84:365-367.
5. Psathakis D, Utschakowski A, Muller G, Broll R, Bruch HP. Clinical significance of duodenal diverticula. *J Am Coll Surg*. 1994;178:257-260.
6. Newman A, Nathan MH. Intraluminal diverticulum of the duodenum in a child. *Am J Roentgenol Radium Ther Nucl Med*. 1968;103:326-329.
7. Fujiwara T, Kino M, Takeoka K, Kobayashi Y, Hamada Y. Intraluminal duodenal diverticulum in a child: incidental onset possibly associated with the ingestion of a foreign body. *Eur J Pediatr*. 1999;158:108-110.
8. Massironi S, Penagini R, Bardella MT, Di Carlo V, Conte D, Quatrini M. An unusual endoscopic feature in the duodenum of a young girl with intraluminal duodenal diverticulum. *Endoscopy*. 2002;34:350.
9. Economides NG, McBurney RP, Hamilton FH 3rd. Intraluminal duodenal diverticulum in the adult. *Ann Surg*. 1977;185:147-152.
10. Jana M, Gupta AK. Intraluminal duodenal diverticulum causing upper GI obstruction. *Indian J Pediatr*. 2016;83:908-909.