CASE REPORT

Laparoscopic Removal of a Large Gastric Trichobezoar in a 4-Year-Old Girl

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ABSTRACT

Background: Standard treatment of large gastric bezoars not amenable to medical or endoscopic management is surgical removal. The optimal operative approach, laparotomy versus laparoscopy, is a contested subject. Though laparoscopic removal has been described, it remains a relatively new technique for surgical management with outcome literature limited to case reports. In addition, currently described laparoscopic techniques often involve limited midline laparotomy incisions or >3 cm extensions of port sites.

Methods: The following describes the case of a 4-year-old girl with a large gastric trichobezoar.

Results: The gastric trichobezoar was successfully removed through a 12-mm left lower quadrant trocar incision cosmetically hidden within a skin crease.

Conclusion: This case, along with accumulating literature, supports the use of laparoscopy to treat large gastric bezoars.

Key Words: Bezoar, Trichobezoar, Laparoscopy.

INTRODUCTION

Gastric trichobezoars are rare occurrences that must be surgically addressed when not amenable to medical therapy or endoscopic removal. Literature regarding laparoscopic removal is sparse, and extraction methods currently involve limited midline laparotomy or port-site extension. Herein, we describe a case of the youngest reported patient to undergo laparoscopic removal of a large, obstructing gastric trichobezoar though a 12-mm incision hidden in a left inguinal skin crease.

CASE REPORT

A 4-year-old girl presented to her primary care physician with 1-month history of weight loss, decreased appetite accompanied by emesis after meals, and abdominal pain that had acutely worsened over the past 2 weeks. The patient had a 1-year history of observed trichotillomania and trichophagia. Although her mother reported a history of "tantrums," the patient had never been seen by a therapist or psychiatrist. Her primary care physician ordered laboratory studies that revealed anemia and a computed tomography (CT) scan that demonstrated a 9.8 x 9.6 x 4-cm gastric mass extension into the proximal duodenum. She was subsequently referred to our institution.

Upon examination, the patient was noted to be underweight, have alopecia, and appeared pale and anxious. A large, tender mass was palpated in the left upper quadrant (LUQ) and epigastric region and extended to the right upper quadrant (RUQ). An endoscopy was performed that confirmed the presence of a large gastric trichobezoar partially obstructing the gastric lumen. In addition, a 3-cm gastric ulcer was appreciated at the lesser curve of the stomach **(Figures 1 and 2)**. Endoscopic removal was unsuccessfully attempted, and the decision was made to proceed with surgical intervention.

Operative Procedure

Entry into the abdomen was achieved via a 5-mm infraumbilical incision. A 30-degree laparoscope was introduced, and 2 additional 5-mm trocars were placed in the right upper quadrant and left mid abdomen. A fourth incision was made in a left inguinal skin crease through which a

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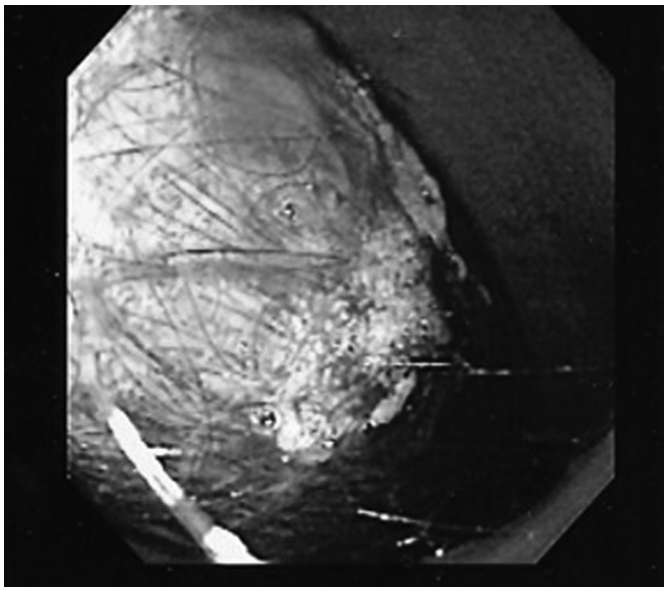

Figure 1. Endoscopic visualization of trichobezoar.

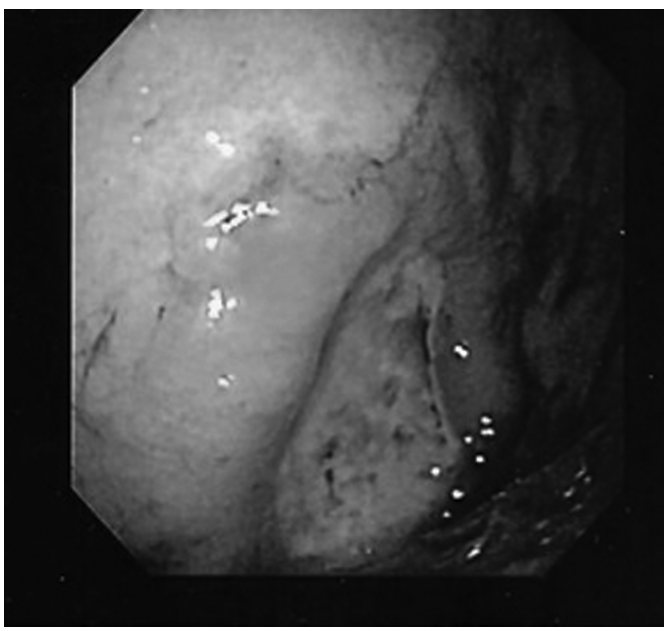

Figure 2. Endoscopic visualization of 3-cm gastric ulcer at lesser curve of stomach.

12-mm trocar was placed **(Figure 3)**. An anterior gastrotomy extending from mid antrum to the body of the stomach was made with a Harmonic scalpel. The bezoar was immediately visualized, and gentle traction was applied to deliver the mass through the gastrotomy in one piece along with the hair that trailed into the duodenum. The bezoar was transferred en bloque to an Autosuture Endo-

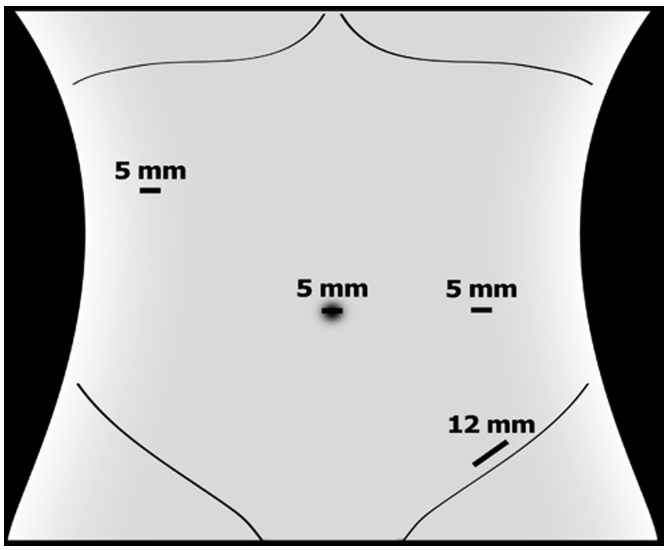

Figure 3. Diagram of port placement for laparoscopic removal of trichobezoar. The 12-mm trocar site hidden in the left inguinal skin fold was also used as the extraction site.

catch-II bag. Because the bezoar was too large to deliver intact, the neck of the bag was brought through the 12-mm trocar incision in the left lower abdominal skin crease. The trichobezoar was then fragmented using clamps and extracted piecemeal resulting in a 192 gm, 15x15x7-cm aggregate. Once the bezoar was removed, the gastrotomy was repaired laparoscopically in 2 layers with a running 2–0 absorbable suture. The peritoneal cavity was explored for debris and copiously irrigated. At the end of the procedure, a nasogastric tube was placed. Total operating time was 2 hours and 58 minutes. Estimated blood loss was 20 cc.

The postoperative course was uncomplicated. The nasogastric tube was removed on postoperative day 1, and the patient was tolerating a regular diet by postoperative day 2. Though medically cleared for discharge on postoperative day 2, she remained in the hospital until postoperative day 4 to ensure arrangement of appropriate psychiatric follow-up. At 6-month follow-up, she has no wound complications, is tolerating a diet with appropriate weight gain, and at present no longer suffers from trichotillomania.

DISCUSSION

Trichobezoars refer to accumulations of hair resulting from long-term ingestion. They are associated with the psychiatric condition trichotillomania, an impulse disorder in which patients compulsively pull out their hair, and

trichophagia. Trichotillomania in children under 6 years of age is considered a more benign and self-limited psychiatric condition than the more common syndrome of late childhood or adult onset hair pulling.[1] Trichobezoars are most commonly found in the stomach, often extending into the first portion of the duodenum. Less common presentations include extension of hair from the stomach throughout the small bowel, a phenomenon known as Rapunzel syndrome.[2] Hair has also been reported to be caught at the ileocecal valve causing intestinal obstruction.[2]

Large gastric bezoars may result in numerous complications, most commonly intestinal obstruction, failure to thrive, and iron deficiency anemia. Anemia, as seen in this patient, is secondary to nutritional deficiency as well as chronic gastrointestinal (GI) bleeding from mucosal irritation and gastric ulcer. Concurrent presence of a gastric ulcer is a well-documented finding in cases of gastric bezoars.[7] If not actively bleeding, gastric ulcers are sufficiently treated by bezoar removal accompanied by re-establishment of nutrition and short-term gastric mucosal protection with either proton pump inhibitors (PPI) or H_2 blockers.

Although nonsurgical interventions exist, including nasogastric lavage or suction, prokinetic agents, enzymatic fragmentation, and endoscopic retrieval, they are often unsuccessful in treating large trichobezoars that cause obstructive symptoms, and surgery is required.[3] The standard surgical approach consists of open gastrotomy via an upper abdominal laparotomy. This procedure leaves patients with a large abdominal incision and increased propensity to develop wound complications. Accumulating data,[4–6] including the case we present, support the use of laparoscopy to treat large gastric bezoars even in small patients.

The first successful laparoscopic removal of a gastric bezoar was reported in 1998 by Nirasawa et al,[7] also a pediatric case. Since then, several successful laparoscopic cases have been reported, primarily in adults and adolescents.[8–10] Though mainly limited to case reports, comparison of laparoscopic and open surgical treatment of bezoars causing small bowel obstruction found fewer postoperative complications and reduced hospital stay in those patients treated laparoscopically[6] **(Table 1)**.

One reason for the decreased complication rate may be related to incision size. Incision size affects recovery time, cosmesis, and the potential for wound complications. Case reports of laparoscopic gastric trichobezoar removal describe incision sizes ranging from mini-laparotomy incisions extending from a suprapubic port site[7] to 4-cm extension of 10-mm abdominal trocar sites.[11] Kanetaka et al[12] were the first to report bezoar removal via a small 2-cm incision. Though minimal, the incision was made in the epigastric region and did not provide the cosmesis afforded by an incision hidden in the suprapubic skin crease[7] or in the inguinal skin fold, as in our case. In particular, our modified technique of hiding a 12-mm trocar incision in the inguinal skin fold provided the patient with an excellent functional and cosmetic outcome.

Though laparoscopy confers many advantages, critics of the technique cite abdominal spillage with concomitant contamination as well as longer operative times as major drawbacks. Minimization of spillage can be accomplished by careful transfer of the trichobezoar and associated debris to a sturdy endobag that will not tear easily. In

Table 1.
Laparoscopic Removal of Gastric Bezoars: Comparison of Reported Cases Using Laparoscopy and a Combined Laparoscopic and Gastroscopic Approach

Case Report	Year	Age/Sex of Patient	Max. Incision Site Size	Operating Time	Time to Tolerating PO*	Time to Discharge
Nirasawa et al	1998	7 F	Minilaparotomy (unspecified length), Suprapubic	5 hours	Not Reported	Not Reported
Kanetaka et al	2003	11 F	2 cm Epigastric	2 hours	POD 5	POD 11
Shami et al	2007	19 F	4.1 cm Left Lower Quadrant	3 hours, 40 minutes	POD 1	POD 3

*PO = by mouth; POD = postoperative day.

† patient was ready for d/c on POD2 but remained for psychiatric follow-up

addition, abdominal spillage was successfully avoided upon specimen retrieval by pulling the neck of the bag through the 12-mm incision and extracting the bezoar fragments without their contacting the patient. This method also likely contributed to wound protection. Once the specimen was removed, careful inspection of the abdomen with copious irrigation also prevented potential intraabdominal complications. Laparoscopy may be preferable in this situation, as it permits extensive exploration of the peritoneal cavity to assure removal of all debris.

Another potential drawback of laparoscopy is increased operative time. The first reported case of laparoscopic removal in a 7-year-old girl with an 11 x 9 x 6-cm bezoar required 5 hours.[9] As surgeons have become more experienced with advanced laparoscopy, operative time has improved. A recent case report demonstrated removal of a 720 g gastric bezoar in a 19-year-old in 3 hours and 40 minutes.[11] Our intraoperative time for a 192 g trichobezoar was just under 3 hours. We noted that the most significant factor contributing to procedure duration was the fragmentation and removal of the bezoar. Bezoar, incision, and patient size as well as medical condition will all effect operative time and should be taken into consideration when weighing surgical risk and selection of the appropriate intervention. Though technically feasible, laparoscopic removal in a small pediatric patient increases procedural difficulty given the smaller space within which to work. Also, patients who are unstable or critically ill may benefit from shorter intraoperative time and may not be appropriate candidates for laparoscopic intervention.

CONCLUSION

Laparoscopic removal of large gastric trichobezoars is technically feasible though small incisions without requiring port-site extension or limited midline laparotomy. Laparoscopy confers many advantages over laparotomy as demonstrated by our patient. The outcome of this case in addition to a growing body of literature supports laparoscopic removal of large gastric bezoars, even in young pediatric patients.

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