A new technique for endoscopic treatment of gastric phytobezoars : fragmentation using guidewire

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Abstract

Background and Study Aims : **Bezoars result from accumulation of indigestible materials in the gastrointestinal tract and often occur in the stomach. In this study, we evaluated the use of guidewires in patients with gastric phytobezoars (PBs) as a new method for PB removal and examined the safety of the procedure.**

Patients and Methods : **Between February 2009 and January 2013, we analyzed data from 11 patients with gastric PBs. We fitted a transparent cap to a standard endoscope (EG450WR5, Fujinon), and a 0.025 inch guidewire was passed through the standart endoscope. PBs were surrounded by a loop in the guidewire and destroyed. After 2 weeks of treatment, patients were re-evaluated for effectiveness.**

Results : **PB fragmentation time was 5-11 minutes. In five patients with a history of gastric surgery, we needed an additional 16-28 minutes for removal of the fragments. In six patients additionally treated with enzymatic degradation after the breaking procedure, PBs completely disappeared within 2 weeks. There were no complications during the procedure.**

Conclusions : **The guidewire and fragmentation procedure for PBs is an efficient and reliable method. When combined with enzymatic degradation, PBs can be managed quickly and effectively.** (Acta gastroenterol. belg., **2014**, 77, **389-392**).

Key words : gastric phytobezoar, endoscopic treatment, guidewire.

Introduction

Bezoars result from accumulation of indigestible materials in the gastrointestinal tract and often occur in the stomach. Three general types of bezoars have been identified : phytobezoars (PBs), which are caused by accumulation of indigestible herbal products ; trichobezoars, which are caused by accumulation of hair and hair-like materials ; and pharmacobezoars, which are caused accumulation of medication (1).

Among these, PBs are the most common type. Although the prevalence of gastric PBs has been reported as 0.4%, the exact figure is unknown (2). Nutriment containing large amounts of indigestible fibers such as celery, zucchini, prunes, raisins, leeks, red beets, and dates, and cellulose, hemicellulose, and lignin have been implicated (3,4). Clinical symptoms can change according to bezoar location, and some patients who have gastric bezoars can be asymptomatic.

The target for treatment of bezoars is their removal and prevention of recurrence. Although surgical treatment is used frequently for trichobezoars (1), PBs can be extracted in many ways including gastric lavage, enzymatic dissolution, endoscopic fragmentation, or conventional or laparoscopic surgery (1,5-8).

In this study, we retrospectively observed a new technique, including the procedure and its reliability, efficiency, and results, for fragmentation of bezoars with the help of a guidewire in patients with gastric PBs that could not be removed by conservative and standart endoscopic approaches.

Materials and methods

Records of 11 patients (three female, eight male, aged 40-72 years, median age 63 years) diagnosed with gastric PBs between February 2009 and 2013 were retrospectively collected. Nine patients were referred for surgery because their PBs could not be removed by endoscopic at other institutions. Patients with a diagnosis of acute abdomen and/or intestinal obstruction were excluded from evaluation. Patients' age, sex, smoking/alcohol history, treatment, surgical history, comorbidity, clinical findings, size of bezoars, and complications observed during the procedure were collected. Patients were prepared with topical anesthesia (lidocaine spray) and sedation (5 mg midazolam) before the endoscopic procedure. After esophageal intubation with a standard gastroscope (Fujinon EG 450 WR 5, Fuji Photo Optical Co. Ltd., Tokyo, Japan), the PBs were observed in the stomach. First, except for the patients who underwent subtotal gastrectomy, we confirmed that the pylorus and duodenum were normal. Then, with a large polypectomy snare, we attempted to catch and disintegrate the PBs. For those that could not be destroyed by fragmentation, electrocautery was used. For patients whose PBs could not be destroyed by these procedures, patients were advised to pineapple juice and/or Coca Cola. Two weeks later, in patients with no change in PB size, the esophagus was intubated by standard gastroscope, to which was attached a transparent cap to prevent damage to the device during

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Fig. 1. — Preparing the guidewire and advancing through the scope channel

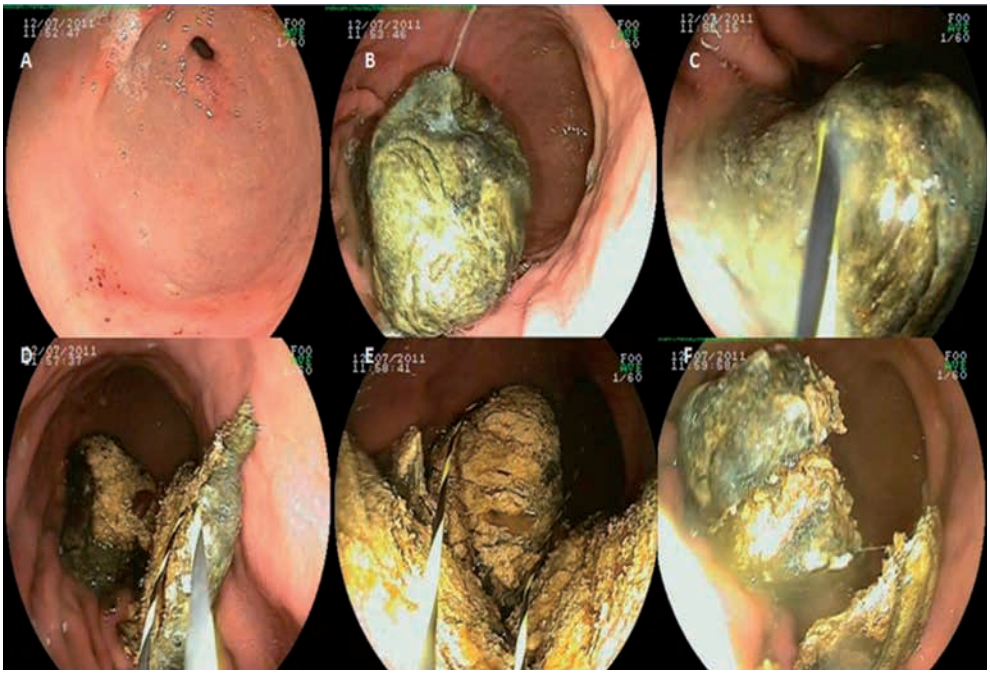

Fig. 2. — Fragmentation of a gastric phytobezoar in a patient with type II diabetes mellitus. A : Superficial ulcerations and erosions at antrum ; B : Phytobezoar at body-antrum border ; C-F : Fragmentation of a gastric phytobezoar with the help of guidewire.

the procedure. With gastric intubation, a guidewire (size : 0.025 inch x 480 cm ; product no : M0055656010 ; Boston Scientific, Alajuela, Costa Rica) was passed through the gastroscope lumen. The guidewire was formed into a ring shape by pushing one of the folded ends against the gastric lumen. The PB was then divided into small pieces by grasping it in the guidewire loop and retracting the wire toward the endoscope (Fig. 1 and Fig. 2). In some patients in whom use of the guidewire was unduly restricted by the transparent cap, the procedure was completed without the cap.

Results

The patients' symptoms, the size of the bezoar and concomitant lesions are shown in Table 1. Five patients (45%) had a history of gastric surgery (two with truncal vagotomy and pyloroplasty, two with gastroenterostomy, and one with subtotal gastrectomy via a Billroth II operation), two (18%) patients had type II diabetes mellitus, one (9%) had clinical hypothyroidism and diabetes mellitus type II, one (9%) had chronic renal failure, and no predisposing factors or anatomical abnormalities (e.g.,

Table 1. — **Size of gastric bezoars and the accompanying lesions and symptoms**

Patient number	Age	Sex	Size of Bezoar (mm)	Associated with Gastric Lesion	Symptoms
1	40	Woman	45 × 60	Gastric erosions	Epigastric pain
2	48	Man	50 × 80	Gastric ulcer	Epigastric pain, epigastric sense of fullness, nausea
3	72	Man	60 × 70	Gastric erosions	Epigastric pain, epigastric sense of fullness, nausea, womiting, weight loss
4	58	Woman	45 × 50	Gastric erosions and superficial ulcers	Epigastric sense of fullness, nausea, womiting
5	63	Man	50 × 60	Gastric ulcers	Epigastric pain, epigastric sense of fullness
6	66	Man	45 × 50	Gastric erosions	Epigastric pain
7	52	Woman	50 × 60	Gastric ulcers	Epigastric pain
8	68	Man	60 × 60	Feature is not observed	Epigastric sense of fullness, nausea
9	57	Man	45 × 70	Gastric ulcers and scars of healed ulcers	Epigastric pain, epigastric sense of fullness, nausea
10	63	Man	60 × 60	Gastric erosions	Epigastrik pain, epigastric sense of fullness
11	69	Man	80 × 60	Gastric erosions	Epigastric pain, epigastric sense of fullness, nausea, womiting, weight loss

Note: sizes of bezoars were measured and reported by use of large polypectomy snare (diameter 40 mm) in all patients.

stenosis) were present in two (18%) patients. The time between detection of the PBs and operation was 3-8 years. Two patients (18%) had hypertension, and one (9%) had coronary artery disease. Two patients (18%) who had no history of alcohol consumption were smokers.

The time required for the fragmentation of PBs with the guidewire ranged from 5 to 11 minutes. Among patients with a surgical history, bezoar pieces were removed with the endoscopic procedure in five patients ; then, five patients who had normal pyloric valves and no duodenal obstruction were given pineapple juice (once/day) after the procedure, and one was given pineapple juice (once/day) and Coca Cola (once/day). The process of removing the bezoar pieces required an additional 16-28 minutes for five patients. In six patients who underwent dissolution treatment, no PB or other symptom (such as intestinal obstruction due to bezoar migration) was seen at 2 weeks after the procedure.

During the PB fragmentation procedure with the guidewire, no additional problems were experienced by the patients except for superficial erosions. During and after the procedure, no complications were seen. A significant risk of the procedure is the potential for damaging the endoscope during fragmentation after the PB has been caught with the guidewire. To prevent this, a cap must be attached to the end of endoscope. However, when we performed the procedure without the cap, no damage was observed.

Discussion

Gastric PBs often occur in conjunction with gastrointestinal motility disorders, sometimes due to previous gastric surgery. Motility disorder leads to the accumulation of undigested nutriment. It has been reported that 20-93% of PB patients have a history of gastric surgery (5,9). Gastric surgery may delay gastric emptying by reducing motility, which may contribute to loss of pyloric function and hypoacidic bezoar formation (10,11). In patients affected by gastric motility, such as those with diabetes mellitus, the risk of bezoar development is increased. However, in 6-14% of patients, no predisposing risk factors could be detected (8,12,13). In the present study, 45% of patients had a history of gastric surgery, and three (27%) had diabetes mellitus ; no predisposing factors were observed in two.

In 85-90% of patients with gastric PBs, treatment with enzymatic dissolution and endoscopic mechanical fragmentation is successful. It has been reported that treatment-resistant gastric bezoars can be treated with the help of lithotripsy, Nd :YAG laser treatment, needle-knife sphincterotomy (3), or endoscopic suction (6). In particular, if lithotripsy (14) and Nd:YAG laser (15) fail in treatment-resistant gastric bezoars, surgical treatment is required. With these methods, the majority of gastric bezoars can be treated. However, an important disadvantage is the length of time required for the procedure. The risk of aspiration increases with the duration of the procedure. Another problem is that some of the necessary equipment is not found in all endoscopy units. An important advantage of fragmentation of bezoars with a guidewire is the short duration of the procedure (5-11 minutes). Especially in patients with preserved pyloric function, when fragmentation is used in combination with enzymatic degradation, no significant additional time is required for the procedure, although the time increases if the fragmented bezoars are removed. Guidewires are also readily accessible in endoscopy units.

It has been reported that gastric PBs can be effectively dissolved and treated by enzymatic degradation using

papain, cellulose, and, more recently, Coca Cola. However, enzymatic degradation requires a long treatment time to achieve effective results, and at high doses, these treatments (especially papain) may cause gastric ulcers and electrolyte disturbances (7,16). Furthermore, data about the action of these substances vary, and despite the addition of endoscopic treatment, surgery may be needed (17,18). Some PBs may not respond to either standard endoscopic fragmentation (i.e., snare, electrocautery, or forceps) or enzymatic degradation (such as pineapple juice and Coca Cola). The proportion of patients with gastric PBs that fail conservative and endoscopic treatment is low. These patients are treated with surgical procedures (conventional or laparoscopic) (8). Nine of our patients in this study whowere referred by other centers had been treated with standard endoscopic methods without success. By using a 0.025 inch guidewire, the PBs were successfully fragmented in all 11 patients in the present study. Patients whose disintegrated bezoars could not be removed endoscopically and who were treated with follow-up enzymatic degradation for 2 weeks showed no sign of PBs at follow-up.

No complications were observed in the present study except minor erosion due to contact between the guidewire and the mucosa.

Another important procedure-related issue is the possibility of damage to the camera when the endoscope comes in contact with the PBs. This can be avoided by using a cap on the endoscope ; however, there was no damage to the endoscope during the procedures conducted without using a cap. Especially when using large-channel endoscope, passing the guidewire through the endoscope channel is another precaution that can prevent damage. During the procedure, the guidewire should be folded so that a loop can easily be formed when the wire exits from the endoscope. For this reason, if standard endoscopes are used, 0.025 inch or thinner guidewire should be used. In large-channel endoscopes, other size of guidewires can be used.

This procedure has shown good results for gastric PBs, and it has also been tested on one patient with an intestinal PB. This procedure is not suitable for patients whose intestinal lumen is fully obstructed with bezoars (especially large ones) because of luminal stenosis and luminal cell structure. It has been observed that luminal stenosis and tortuosity do not allow the guidewire to open sufficiently.

Considering the results of the present study, PBs, especially large ones that cannot be removed by conventional endoscopic methods (with the help of snares or forceps), can be treated safely, successfully, and rapidly with the help of a guidewire. In patients with pylorus preservation, a combination of fragmentation with a guidewire and enzymatic dissolution (pineapple juice and/or Coca Cola) significantly shortens the procedure time. Especially in patients with gastric PBs without precise indications for surgery (such as perforation or ileus), this method can be used safely and reduces the need for surgical intervention due to its ease of use and impressive results.

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