



BRIEF REPORT

Cellulase treatment in 3 cases of large phytobezoars

J. Fernández Morató,^{a,*} L. Ilzarbe Sánchez,^b J. Bessa Caserras,^b
and J. Mateu de Antonio^a

^a*Servicio de Farmacia, Hospital del Mar (IMAS), Barcelona, Spain*

^b*Servicio de Digestología, Hospital del Mar (IMAS), Barcelona, Spain*

Received May 26, 2008; accepted March 2, 2009

KEYWORDS

Phytobezoar;
Cellulase;
Intestinal obstruction;
Conservative
treatment;
Endoscopy

Abstract

Introduction: A bezoar is a hard mass of undigested foreign matter found in the gastrointestinal system. The most common type is the phytobezoar, which is composed of vegetable fibres. There is no current consensus as to its treatment. Three cases of phytobezoars treated with cellulase are described.

Patients and method: Case 1: patient with large gastric phytobezoar. Initial treatment with nasogastric cola drink lavages was ineffective. Subsequent treatment with cellulase was successful. Case 2: patient with gastric phytobezoar who was treated with cellulase and metoclopramide. Definitive fragmentation was performed with the endoscopy technique. Case 3: patient with large intestinal phytobezoar. The patient was treated by endoscopic lysis with partial success. Subsequent treatment with cellulase led to complete disintegration. In all the cases, cellulase was administered in pure form by nasogastric tube, and none of the patients suffered adverse effects.

Conclusions: Treatment with cellulase is based on the enzymatic degradation of the bezoar. It has been shown to be effective as the treatment of choice in earlier studies with few patients. This agent seems to be a good alternative for patients with large phytobezoars.

© 2008 SEFH. Published by Elsevier España, S.L. All rights reserved.

*Corresponding author.

E-mail address: 96736@mas.imim.es (J. Fernández Morató).

PALABRAS CLAVE

Fitobezoar;
Celulasa;
Obstrucción
intestinal;
Tratamiento
conservador;
Endoscopia

Tratamiento con celulasa en 3 casos de fitobezoares de gran tamaño**Resumen**

Introducción: Los bezoares son concreciones de material extraño no digerido localizadas en el tracto gastrointestinal. Los más comunes son los fitobezoares, formados por restos vegetales. Actualmente no hay consenso sobre su tratamiento. Se describen 3 casos de fitobezoares tratados con celulasa.

Pacientes y método: El caso 1 es un paciente con fitobezoar gástrico de grandes dimensiones. Se trató inicialmente con lavados de bebida de cola por sonda nasogástrica, pero resultó inefectivo. El tratamiento posterior con celulasa tuvo éxito. El caso 2 es un paciente con fitobezoar gástrico que se trató con celulasa y metoclopramida. La fragmentación definitiva se realizó mediante técnica endoscópica. Y el caso 3 es un paciente con un gran fitobezoar intestinal. Se trató mediante lisis endoscópica, que tuvo un éxito parcial. Posteriormente recibió celulasa y la disgregación fue completa. En todos los casos se administró celulasa como sustancia pura por sonda nasogástrica y ningún paciente presentó efectos adversos.

Conclusiones: La terapia con celulasa se basa en la degradación enzimática del bezoar. Ha demostrado eficacia como tratamiento de primera elección en estudios previos de pocos pacientes. Este agente parece una buena alternativa en pacientes con fitobezoares de gran tamaño.

© 2008 SEFH. Publicado por Elsevier España, S.L. Todos los derechos reservados.

Case 1

The patient is a female of 83-year-old, with no history of digestive pathology, who attended the emergency department due to general colicky abdominal pain which had developed over 1 month, with alteration in bowel movements, a clinical picture of gastroesophageal reflux, asthenia, and anorexia. She presented with an enlarged stomach with the sensation of obstruction of the left hemiabdomen on touching. A simple radiograph of the abdomen showed an accumulation of bubbles of gas in the left hemiabdomen which was initially thought to be an accumulation of faeces. Computerised tomography (CT) showed significant gastric swelling with abundant solid waste. An upper gastrointestinal endoscopy confirmed the intragastric presence of a large phytobezoar and probable partially stenosing pylorobulbar neoplasm. A nasogastric (NG) aspiration tube was inserted and coca-cola lavage was started every 8 h for 4 days. The clinical picture did not improve and therefore coca-cola lavage was replaced by cellulase treatment (Cellulase from Roig Farma, Fagron group, Barcelona). A total of 5 g in 300 mL of water instilled for 2 h a day was administered via the NG tube for 5 days. The volume of gastric waste suction increased and the abdominal swelling improved significantly. The disappearance of phytobezoar was confirmed via simple radiography. Subsequently, once the neoplasm was confirmed as a poorly differentiated gastric adenocarcinoma, a full gastrectomy was performed. There were post-operative complications, with peritoneal infection and

secondary sepsis, which required admission to the intensive care unit (ICU) 1 week following the intervention. Finally, the patient died from septic shock 24 h after admission into the ICU.

Case 2

A male patient of 68-year-old, who had undergone a cholecystectomy and Billroth type II gastrectomy 20 years previously for a peptic ulcer, with anastomotic leakage in an endoscopic control 3 years previously. The patient attended the emergency department due to abdominal pain in the left lumbar region lasting 3 days, accompanied with nausea, postprandial vomiting, diarrhoea with no traces of blood, and anorexia, with weight loss of 3-4 kg in the last month. The patient complained of frequent dyspepsia and early satiety, which was treated with omeprazole and almagate. In the physical examination the abdomen was soft but painful to touch. A simple radiograph of the abdomen showed an accumulation of bubbles of gas distributed throughout the left upper quadrant (Figure 1) and the CT showed gastric swelling with abundant retention of solid food compatible with a phytobezoar.

An NG aspiration tube was inserted and treatment with intravenous metoclopramide (10 mg every 6 h) and cellulase (5 g a day) was started for 5 days, administered in the same way as in case 1. A gastrointestinal endoscopy performed 24 h after finishing treatment showed vegetal waste forming a mass with a diameter of 4 cm and of average consistency.



Figure 1 Simple radiograph of abdomen before treatment. An accumulation of bubbles of gas is observed distributed throughout the left upper quadrant, corresponding to the gastric cavity occupied by the phytobezoar, which moved down towards the colon.



Figure 2 Simple radiograph of the abdomen following treatment with cellulase. The gastric area is seen as aerated and without solid content.

To eliminate this, it was fragmented using a polypectomy snare. After confirming the absence of any remains of the phytobezoar via radiology (Figure 2), oral diet was reintroduced without complications and the patient was discharged 48 h after finishing treatment.

Case 3

A male patient of 69-year-old, moderate alcohol consumer and type 2 diabetic, undergoing treatment with oral antidiabetics and ranitidine. Underwent Billroth II gastrectomy for gastroduodenal peptic ulcer 30 years previously (with extensive anastomotic leakage and no lesions in the last endoscopic control 10 years previously) and had undergone a cholecystectomy. Attended the emergency department with a clinical picture of 15 days vomiting and diarrhoea with no traces of blood, accompanied by weight loss of 8 kg, asthenia, and anorexia. The physical examination showed central abdominal swelling with pain to touch and preserved peristalsis. An NG tube was inserted on a slant and 800 mL of retained liquid was drained in the first 24 h. The gastrointestinal endoscopy showed gastroenteroanastomosis with erythematous, friable and ulcerated mucous, and a large phytobezoar in the efferent intestinal ansa. Fragmentation of the bezoar was attempted with 3-pronged tweezers, but this was only partially achieved.

Cellulase 5 g was then started for 72 h as described above. The patient remained in complete fasting during their admission. On completing the treatment, the abdominal CT was repeated and no remains of the phytobezoar were observed nor the presence of other intestinal lesions. Given the good clinical evolution, the patient was discharged 48 h after completing the treatment.

Discussion

Treatment of phytobezoars is based on surgical, endoscopic and/ or conservative methods.^{1,4-6} Surgical extraction is reserved for large or hard phytobezoars following an ineffective conservative approach. Endoscopic techniques offer good results in non-complicated cases; however they are not useful in cases of large phytobezoars or those with hard consistency or obstructions of the gastrointestinal tract.⁴⁻⁶ Conservative therapy is based on chemical deterioration and prokinetic treatment. The latter is contraindicated in cases of large bezoars and/ or those of hard consistency and in the presence of digestive haemorrhage or perforation.^{2,4} Breakdown of the bezoar is achieved with coca-cola drinks and/ or enzyme substances such as cellulase, papain, and acetylcysteine.²⁻⁵ To date, published experience with coca-cola is limited to a few cases; however its use has been effective, safe, fast and easily accessible. The action mechanism is not known, however it is suggested that the bicarbonate content or the carbon dioxide bubbles combined with the acidic pH levels produces a disintegrating effect.⁵⁻⁷ In case 1, this treatment was not successful, possibly since this was a large phytobezoar.

Cellulase acts by breaking the link between leuco-anthocyanin and hemicellulose-cellulose.²⁻³ Its successful use for this indication was first described in 1968.² A subsequent review of nine studies including 19 patients in total showed 100% efficacy.² Bonilla et al³ published a study with 7 consecutive patients, resulting in 100% efficacy on using cellulase as a first choice treatment.

In cases 1 and 3 this substance was used as an alternative treatment following the failure of the other options. The dose of cellulase varies depending on the administration method. In the first studies three 25 mg tablets of cellulase mixed with pepsin, pancreatic enzymes and ursodeoxycholic acid were administered after each meal for two to five days.² More recent studies describe the use of the pure substance at higher doses, however without any differences in terms of efficacy.² Several publications have described daily administration, either orally or by NG tube, of 3-5 g of cellulase in 300-500 mL of water for 2 h for 2 to 5 days.^{2,3} This administration was used in the patients included in this study, all of whom had NG tubes fitted. None of the patients showed adverse effects, thus coinciding with the good safety profile reported in the published cases.^{2-4,7} The only complication described was one case of intestinal obstruction due to the migration of fragments resulting from disintegration.⁸ In case 2, this problem was avoided with the endoscopic extraction of said fragments.

Experience reported to date with cellulase is based on hardly thirty or so patients. In our cases, the use of cellulase was effective and safe in disintegrating large phytobezoars.

References

1. Beppu T, Sugimoto K, Shiraki K, Takei Y, Yoshimura H, Tagawa S. Phytobezoars. *Inter Med.* 2008;47:119.
2. Walker-Penard P. Update on the Medicinal management of phytobezoars. *Am J Gastroenterol.* 1993;88:1663-6.
3. Bonilla F, Mirete JC, Questa A, Sillero C, González M. Treatment of gastric phytobezoars with cellulase. *Rev Esp Enferm Dig.* 1999;91:809-11.
4. Baker E, Baker W, Cloney D. Resolution of a phytobezoar with Aldolph's meat tenderizer. *Pharmacotherapy.* 2007;27:299-302.
5. Martínez de Juan F, Martínez-Lapiedra C, Fricazo V. Disolución de fitobezoar con Coca-Cola. *Gastroenterol Hepatol.* 2006;29:291-3.
6. Chung YW, Han DS, Park YK, Son BK, Paik CH, Jeon YC, et al. Huge gastric diospyrobezoars successfully treated by oral intake and endoscopic injection of Coca-Cola. *Dig Liver Dis.* 2006;38:515-7.
7. Matsushita M, Fukui T, Uchida K, Nishio A, Okazaki K. Effective "Cola-Cola" therapy for phytobezoars. *Inter Med.* 2008;47:1161.
8. Nomura H, Kitamura T, Takahashi Y, Mai M. Small-bowel obstruction during enzymatic treatment of gastric bezoar. *Endoscopy.* 1997;29:424-6.