

## An Unusual Cause of Intestinal Obstruction in an Infant: Phytobezoar

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**Abstract** We reported a case of duodenal obstruction caused by phytobezoar in an 11 months old infant. There was absent history of unusual food ingestion and the definitive diagnosis could only be made intraoperatively as signs of intestinal obstruction evolved. The clinical course was described with a review of literature on this rare condition.

**Key words** Infant; Phytobezoar

### Case Report

The patient is an 11 months old Chinese girl, with good past health, presented with low-grade fever and vomiting for 2 days. A few tiny ulcers were noted on the soft palate and she was managed as herpangina. Fever subsided shortly after admission. She had a few episodes of coffee ground vomitus which resolved after giving intravenous ranitidine. Vomiting with yellowish fluid persisted and the patient was rather irritable. She passed normal stool on the day before admission but no bowel motion thereafter. Repeated

examination in the first 2 days revealed soft, non-distended abdomen, no mass was palpated and bowel sounds were active. Rectal examination showed only brownish soft stool. Blood tests included complete blood picture, renal function tests, serum amylase and C-reactive protein were normal. Abdominal X-ray showed reduced bowel shadow over the right lower quadrant with slightly dilated stomach shadow but no other signs suggestive of intestinal obstruction e.g. dilated bowel loop and air-fluid level. In view of persistent vomiting and absent bowel motion, upper gastrointestinal tract obstruction was suspected. However, ultrasound abdomen revealed no significant abnormality. On the third day, the patient was increasingly lethargic and the bowel sounds became more sluggish. In order to exclude other causes of repeated vomiting, a series of investigations including computed tomography (CT) brain and lumbar puncture was performed which turn to be normal. She was re-examined after sedation for the above procedures and a vague sausage-shaped mass about 4 cm x 1 cm was felt just above the umbilical region.

Patient was then transferred to a regional paediatric surgical unit for further management. Repeated ultrasound abdomen was normal. Water-soluble contrast examination of upper gastrointestinal tract showed passage of contrast through stomach to duodenum with cutoff at third (transverse) portion of duodenum (Figure 1). Laparotomy showed a mass at duodenum and a 3x2x2 cm bezoar composed mainly of an olive which was removed by enterotomy (Figure 2). Patient had an uneventful recovery.

The olive was shown to mother who subsequently

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Received June 23, 2009



**Figure 1** Water soluble contrast study showed attenuation of contrast at D3 level.



**Figure 2** The olive bezoar extracted from the duodenum.

recalled that patient might have swallowed the olive during a family gathering 4 days prior to admission. The adults ate fresh Chinese olives while the children played around. She remembered that patient did cough a bit while playing but no definite choking. Mother did not stock olive at home.

## Discussion

We described a case of unusual bowel obstruction caused by an olive containing phytobezoar in an infant. There was a delay in diagnosis. The initial presentation of fever and ulcers over the soft palate was a red herring to mislead the cause of vomiting as infective in origin. Retrospectively, the cause of ulcers was likely due to trauma induced by the

sharp ends of the olive stone. Moreover, despite the child was having persistent vomiting, absent bowel motion and yellowish fluid vomitus (likely bile stained), the alertness to an obstructive cause is carried away by the initial normal abdominal examination, apparently normal X-ray without dilated bowel loops and negative ultrasonography findings. Only as the clinical course evolved, the picture was more compatible with upper gastrointestinal tract obstruction leading to further investigations. The specific cause remained uncertain and the culprit was finally identified during surgical exploration. We postulate that the accidentally swallowed olive act as a nidus causing partial blockage of the duodenum. When the infant continued to feed, more food accumulate and form a bezoar leading to the total obstruction. Diagnosis of bezoar could be difficult especially in young children with absence of a suggestive history.

## Background

Bezoars are concretions of indigestible foreign materials that remain in gastrointestinal tract. Overtime, they associate with mucous and form masses. They are usually found in the stomach but can be found anywhere between the esophagus to the rectum. The word 'bezoar' derived from a Persian word 'pâdzahr' which literally means "protection from poison". Since 1000BC, bezoars in digestive tracts had been detected in some animals and humans. Baudamant made first report of human trichobezoar in 1779.<sup>1</sup> Most articles on bezoars are case reports or case series, with only a few on paediatric cases.

## Classification

Bezoars are traditionally classified according to their contents: trichobezoar (hair), phytobezoars (vegetable matters), pharmacobezoars (medication) and lactobezoars (concentrated milk formula).<sup>1</sup> More recent case reports created new terms based on the composition of the bezoars: diospyrobezoars (unripe persimmons),<sup>2</sup> chewing gums bezoars<sup>3</sup> and plastobezoars.<sup>4</sup>

Phytobezoars are the most common type of bezoars today. Food material non-digestible by humans including cellulose, hemicellulose, lignin and fruit tannins. These non-digestible materials are found in foods such as celery, pumpkins, grape skins, prunes, raisins, and most notably persimmons. In high concentration, fruit tannins may form a coagulum upon exposure to an acidic environment initiating the formation of a phytobezoar.<sup>5</sup>

Chinese Olive (*Canarium album* Raeusch.) is an oval fruits with an internal stone that is pointed at both ends.

The fruit can be eaten fresh or preserved. It has a size of around 3 cm in length with a glossy surface and crispy flesh; differs from the Mediterranean olive (*Olea europaea*) which is much smaller in size and usually softens after preservation. In our patient, the whole and un-chewed fruit olive was swallowed and obstructed the duodenum.

### **Risk Factors**

In adult population, risk factors for bezoars include previous gastric surgery, reduced gastric motility, hypoacidity, poor mastication, overindulgence of food with high fiber contents, and psychiatric illnesses.<sup>6,7</sup> There was a reported case of phytobezoar in a 64-year-old man with Noonan syndrome known to associate with gastrointestinal dysfunction and difficulties.<sup>8</sup>

Altered gastrointestinal anatomy and/or motility are rare in children. Bezoars complicating previous gastric pathology and operation in this age group are extremely rare.<sup>9</sup> Risk factors of any form of bezoars in children include developmental and behavioural problems, emotional disturbance, trichotillomania, pica, and history of ingestion of unusual substance.<sup>10,11</sup>

Our patient is developmentally normal with no history of unusual eating behaviour. The reported incident might well be an accident of swallowing of a unusual food.

### **Clinical Features**

Clinical manifestations of bezoars vary from asymptomatic to acute abdominal syndrome depending on the locations of the bezoars. Many of the patients are asymptomatic or just having vague symptoms. Up to 80% of patients with bezoars presented with vague feeling of epigastric discomfort. Other symptoms includes abdominal bloating, nausea and vomiting, early satiety, post-pandial fullness, halitosis, anorexia, dysphagia and weight loss that may last for weeks or months.<sup>5,10</sup>

Bezoars in the esophagus may present with dysphagia, reflux and retrosternal pain.<sup>5</sup> Gastric bezoars may present with epigastric pain, nausea and vomiting, gastric ulcers from pressure necrosis, and gastric outlet obstruction. Gastric bezoars may also break off and pass the pylorus causing small bowel obstruction.<sup>6</sup> There have been reported cases of gastric trichobezoars extending throughout the entire small intestine, known as Rapunzel syndrome.<sup>12</sup> Small bowel bezoars usually present more acutely with sign and symptoms of intestinal obstruction, or perforation<sup>5</sup>. Bezoar can also occurred in rectum that presented with faecal impaction.<sup>13</sup>

In a case series of 7 paediatric patients with bezoars (15

months to 9 years), all presented with vomiting and abdominal pain. Anorexia, nausea, weakness, weight loss and constipation were also noted. Six patients had trichobezoars, 5 developed complications like extension to the jejunum, intussusception, hypoproteinemia secondary to malnutrition, bowel obstruction, and fatal gastric perforation.<sup>10</sup>

### **Investigations**

Endoscopy is a diagnostic and therapeutic technique of choice for bezoars located in the esophagus and stomach. In cases of small bowel obstruction, plain radiography may show dilated intestinal loops, air-fluid levels and thickened bowel wall. Contrast studies are helpful in non-obstructive bezoars with classic appearance of gastrointestinal filling defects.<sup>5</sup> Abdominal sonography is useful in gastric bezoar. Typical finding of gastric bezoar is a hyperechoic band-like lesion and acoustic shadow. CT is useful in detection of intestinal bezoar that a characteristic small bowel mottled gas pattern may be noted.<sup>6,11</sup>

In our patient, the plain abdominal X-ray showed some vague signs of small bowel obstruction though the ultrasonography failed to target the obstructive site. Contrast study subsequently demonstrated nicely the filling defect caused by the obstruction.

### **Management**

The goal of treatment is removal of the bezoar and prevention of recurrence. The choice of treatment depends largely on the type of bezoar, its location and presence of underlying risk factors. Main state of management includes medical treatment with dissolution, gastric lavage, endoscopic fragmentation and/or removal and surgical removal.<sup>5</sup>

Fruit and vegetable fibres in phytobezoars can be enzymatically degraded by cellulase and papain.<sup>5</sup> A more recent and interesting report is a successful dissolution of a large gastric persimmon phytobezoar by coca cola lavage.<sup>14</sup>

Endoscopic removal or gastric lavage after mechanical fragmentation was being employed for esophageal or gastric bezoars.<sup>4-7</sup> However, mechanical fragmentation may complicate with distal migration of daughter fragments.<sup>6</sup>

Surgical extraction is indicated if medical therapy failed and/or endoscopic removal is unsuccessful. For trichobezoar, medical dissolution is mostly unsuccessful. The twisted strands of hair can result in pressure necrosis and subsequent gut perforation. Though endoscopic removal had been successful, most surgeons would agree

that trichobezoars require operative removal.<sup>5</sup>

Preventive measures for recurrence should be considered for patients with underlying risk factors. Patients should be educated to avoid a high fiber diet. Those with delayed gastric emptying may benefit from long term therapy with prokinetic agents like metoclopramide.<sup>5</sup> For patients with recurrent or trichobezoar, underlying psychological disturbance should be sorted and treated accordingly.

We believed that it was just a single incidence for our patient and risk of recurrence is low. The mother was educated on home safety to prevent further ingestion of unusual matter.

## Conclusion

Intestinal bezoar is a rare but important cause of intestinal obstruction in paediatric patients especially those with risk factors. There may not be an obvious history of ingestion of unusual substances or food, the clinical signs are vague and even misleading; and radiological findings are non-specific. A high index of suspicion and bearing in mind this differential diagnosis for patients with clinical picture of intestinal obstruction can help to make the definitive diagnosis earlier.

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