



Case report

Khat induced bezoar; a rare cause of small bowel obstruction: a case report



Badhaasaa Beyene^{*}, Burka Mohammadsani, Minewor Abdlhadi, Kedest Getachew, Hatae Ahmedin

Haramaya University, College of Health and Medical Sciences, Department of Surgery, Ethiopia

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ABSTRACT

Introduction: Bezoar-induced small bowel obstruction (sbo) is a rare entity that might be difficult to establish diagnosis preoperatively. There are a multitude of factors attributed to its occurrence in different literature. Khat chewing which is widely practiced in eastern African and Middle East countries might contribute directly or indirectly to bezoar formation. It has chemicals known to decrease bowel motility thereby, possibly leading to concretion of proximal gastrointestinal contents. The aim of this case report is to give emphasis on the effect of khat towards bezoar formation as a result of alteration in bowel motility.

Case presentation: This is the case of a 60 years old farmer presented to our Hospital complaining Periumbilical abdominal pain of 3 days duration. He had the cardinal symptoms of obstruction. Historically he used to have intermittent episodes of constipation, otherwise no similar attack before. His staple diet was porridge made of wheat flour mixed with cooked and crushed potato along with cabbage consumed twice a day. He regularly chews Khat, a green leaf which has different chemicals known to have stimulant effect and cause decreased bowel motility.

Discussion: There are diverse reasons behind bezoar formation that cause bowel obstruction; out of which a preoperative diagnosis is made for few. The attributing factors were known retrospectively for majority of the cases but others remain speculations with different scientific reasoning.

In our case, almost the main risk factors incriminated in the causation of bezoar formation and bowel obstruction were assessed with no supportive evidence other than khat associated constipation which has normalized after chewing khat was stopped. Additionally, tannin, an extract of khat polymerizes in an acidic environment to form a glue-like coagulum which can affix to other materials in the stomach that predisposed to bezoar formation.

Conclusion: In patients having features of small bowel obstruction, complaining chronic constipation and who has regular khat chewing habit has to be suspected to have a bezoar as a cause. Bowel motility improves upon stopping chewing khat which may help decrease the recurrence of bezoar formation.

1. Introduction

Bezoars are masses formed from mixed substances in the gastrointestinal system, and they contribute to 4% of small bowel obstructions. Bezoar-induced small bowel obstruction does not show significant clinical difference from bowel obstruction induced by other causes. Therefore, most of the cases are diagnosed postoperatively [1]. Bezoar impaction is considerably less common, with the report frequency around 0.4–4% [2,3]. Similarly a systemic review conducted by Iwamura et al. reported a pooled prevalence of small intestine bezoars within the range of 0.4–4.8% [4].

Bezoar formation is related to various factors, such as

gastrointestinal motility disorders and gastrointestinal surgery for intestinal diverticula, surgical enteroanastomoses, blind pouches, afferent loops, and stenosing or strictures secondary to Crohn's disease and intestinal tuberculosis [5,6].

We present this new finding so far not documented and reported in literature in association with khat chewing that come with complete small bowel obstruction. Surgical intervention was given in a tertiary teaching university hospital led by a senior general surgeon on an emergency base.

The case report was organized according SCARE 2020 guideline [7].

Abbreviations: HFSUH, Hiwot Fana Specialized University Hospital; sbo, small bowel obstruction.

^{*} Corresponding author at: Haramaya University, CHMS, Harar, Ethiopia.

E-mail address: Badhok@gmail.com (B. Beyene).

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2. Presentation of the case

A 60 years old farmer presented to Hiwot Fana Specialized University Hospital (HFSUH) complaining periumbilical abdominal pain of 3 days duration. Associated to this, he had history of frequent bilious vomiting, abdominal distension and failure to pass feces and flatus for 2 days before his presentation. Historically he used to have intermittent episode of constipation; otherwise no similar attack before. His staple diet was porridge mixed with cooked and crushed potato along with cabbage consumed twice a day. He regularly chews approximately 200 gm of Khat on a daily bases. Other than this, he has no history of abdominal surgery and illicit drug use. He has no known family history of genetic diseases and similar illness. He has no psychiatric problem or chronic medical illnesses except hypertension.

Physical examination revealed BP 150–160/85–100 mmHg PR 120 T 36.9 °C. He had dry buccal mucosa but clear sensorium. Abdominal examination showed distended abdomen which moves with respiration. Bowel sound was hyper active with hyper tympanic percussion note. There was only discomfort on deep palpation. Digital rectal examination indicated empty rectum.

Investigations ordered showed: plain abdominal x ray displayed multiple fluid air levels more located at central abdomen with features of complete small bowel obstruction (Fig. 1). Complete blood count and other investigations were determined: White blood cell count = 10.36×10^3 cells/ μ l Neutrophil = 78% hemoglobin = 13.7 mg/dl, Hematocrit = 42%, Platelet count = 626×10^3 cells/dl Blood Urea Nitrogen (BUN) = 66.7 mg/dl, creatinine = 0.98 mg/dl; Alanine transaminase = 22.9 IU/l, Aspartate transaminase = 46.6 IU/l, Alkaline phosphatase (ALP) = 114 IU/l; Serum Electrolyte sodium (Na^+) = 139 mmol/l potassium (K^+) = 3.62 meq/l and chloride (Cl^-) = 109.6 mmol/l.

Patient optimized with crystalloids. Nasogastric tube inserted and drained nearly 500 ml bile mixed GI content. Prophylactic antibiotic and antihypertensive were given as per the protocol of the hospital. With the impression of complete small bowel obstruction, exploratory laparotomy was done and the findings were: distended small bowel starting from distal ileum approximately 20 cm above ileocecal junction; distal to the obstruction, the bowel was collapsed. There was an obstructing intraluminal mass that spans over a length of 5 to 10 cm (Fig. 2). Milking either way was difficult. A 5 cm long enterotomy was made at anti-



Fig. 2. Intraoperative image of a bezoar causing sbo to distal ileum in a 60 years old patient, HFSUH, Ethiopia, 2022.

mesenteric border of the obstructed bowel slightly to the distal normal end; a conglomerated food material whitish to brown in color was removed by crushing into multiple parts (Fig. 3). Enterotomy was closed in transverse fashion; abdomen closed layer by layer. Intraoperative blood loss was less than 50 ml and the duration of surgery was 45 min. Post operatively he stayed smooth course and discharged on sixth day after he tolerated feeding. He was appointed to come to surgical referral clinic at two weeks for follow up. He had hospital visit after two weeks of surgery and reported that he had an improved bowel habit following abstaining khat chewing. Then after, he was followed on telephone calls for nearly six months with no complaint.

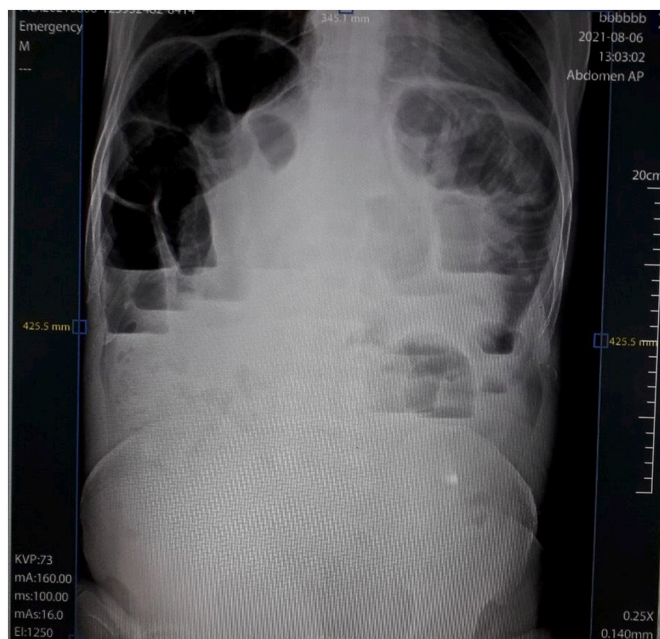


Fig. 1. Plain abdominal x ray of a 60 years old patient showing complete sbo, HFSUH, Ethiopia, 2022.

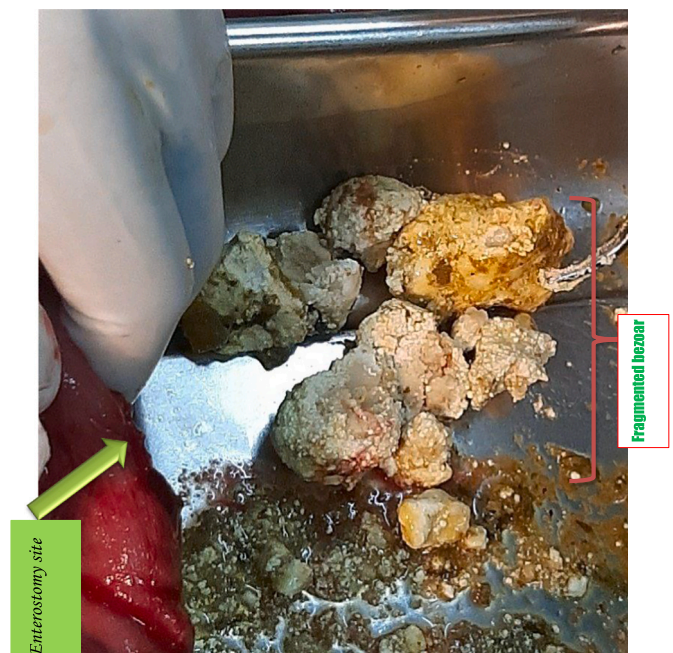


Fig. 3. A bezoar removed through distal ileal enterostomy in a 60 years old patient diagnosed with sbo, HFSUH, Ethiopia, 2022.

3. Discussion

Bezoar-induced small bowel obstruction is a very rare entity that might be difficult to establish diagnosis preoperatively [6,8]. Bezoars are of different types depending on their composition. Those made of plant materials such as fibers, skins and seeds of vegetables and fruits (phytobezoars), ingested hair (trichobezoars), medications (pharmacobezoars), and milk protein in milk-fed infants (lactobezoars) [4].

The risk factors for its formation are diverse; they themselves can cause bowel obstruction. Preoperative diagnosis is rarely made to take non operative measures except few. These common attributing factors were diagnosed, in majority of the cases, retrospectively being anatomical but functional pathologies remain speculations with fewer scientific reasoning. It can be diagnosed with a better accuracy using CT scan but impractical due to resource limitation in low income counties where only few hospitals have it.

In our case, almost all factors incriminated in the causation of bezoar formation and bowel obstruction were dropped out except a known risk factor, khat, which has established effect on bowel motility. It was mentioned in article published by Kemet et al. that Tannin, which is an extract of khat, polymerizes in an acidic environment to form a glue-like coagulum, which can affix to other materials in the stomach [9]. Decreasing intestinal motility is another mechanism through its cathinone, noradrenaline and amphetamine like compounds leading to constipation possibly then bezoar formation [10,11]. A single center study conducted on university students revealed that, constipation was found to be a problem of 80.0% of daily chewers. Hemorrhoid was found in 25.0% of daily chewers and 5.6% of those who chew khat once per week [11,12].

Khat (ch'at, in Ethiopia also called 'Jimaa' in Oromo language) is a green leaf, a plant under genus *Catha* and species of *Catha edulis*, which is largely grown and used in east African countries; particularly in wider eastern parts of Ethiopia, Somalia, parts of Middle East countries; mainly used as psycho-stimulant and for different cultural and social reasons. It is said to enhance social interaction, playing a role in ceremonies such as weddings. Khat contains many compounds that can cause different effects. The major ones include those on the gastro-intestinal system and on the nervous system. Constipation, urine retention and acute cardiovascular effects may be regarded as autonomic (peripheral) nervous system effects; increased alertness, dependence, tolerance and psychiatric symptoms as effects on the central nervous system [10]. This substance is considered as illicit drug in some western countries but its use as well as export is legal in Ethiopia and the horn.

There are different approaches in treating bezoars located at different parts of gastrointestinal tract. Traditionally, different chemicals including coca cola were used to dissolve the concretion in stomach effectively so that patients can pass distally or ease endoscopic removal. The other options of management can be either laparoscopic or open surgery depending on the presence or absence of complications like bowel perforation with intra-abdominal abscess collection. Laparoscopic surgery is a procedure of choice when preoperative diagnosis affirms non complicated obstruction. For the setups where laparoscopic surgery is not available and complicated obstruction is suspected, open surgical approach has to be done promptly. Resection and anastomosis or stoma can be done depending on the presence of complication like gangrenous bowel or perforations [13]. Enterotomy was more successful for bezoars located in the proximal small intestine [3]. In our patient, as mentioned in the case presentation, fragmentation was not successful and removal achieved through enterotomy without difficulty and primary repair was done.

The outcome of patients treated for bezoars are generally good but recurrence is not uncommon if the primary pathology was not removed or treated [2]. Our patient has improved bowel habit after advised on cessation of chewing khat postoperatively. He didn't have any complaint during the six months of follow up period related to his bowel habit change.

4. Conclusion

High index of suspicion has to be made for intestinal obstruction as a result of bezoars especially in those who complains constipation associated to khat chewing. Early intervention minimizes associated complications and decrease duration of hospital stay. Enterotomy is a good option for distal bowel bezoar which is not amenable to manual fragmentation. Lastly, cessation of chewing khat significantly improves bowel bladder habit changes.

Informed consent

A Written informed consent was obtained from the patient for publication of this case report and related image and pictures. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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CRediT authorship contribution statement

BB and HA involved in conception, writing up and interpretation of the case report. BM, MA, KG have involved in editing, interpretations and preparation of the manuscript.

Declaration of competing interest

Authors has no conflict to declare.

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