International Surgery Journal
Naqvi RH et al. Int Surg J. 2022 Sep;9(9):1572-1576
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20222234

Original Research Article

Prospect of food bolus obstruction in a tertiary care hospital

Raheel Hussan Naqvi*, Aaina Gupta, Bhanu Khokher, Surbhi Dhar, Shaarang Gupta

GMC, Jammu, Jammu and Kashmir, India

Received: 26 June 2022
Revised: 29 July 2022
Accepted: 04 August 2022

***Correspondence:**
Dr. Raheel Hussan Naqvi,
E-mail: syedraheelnaqvi@gmail.com

ABSTRACT

Background: Small bowel obstruction (SBO) is a common general surgical emergency usually caused by adhesions, bands or hernias. Food bolus impaction or bezoars remain an uncommon cause, albeit well reported in literature. The objective was to outline the frequency, demographic features, etiopathogenesis and management patterns of acute SBO due to ingested food bolus.
Methods: An observational retrospective study was conducted whereby patients admitted to the surgical emergency of the associated hospital of Government Medical College, Jammu, Jammu and Kashmir, India as cases of acute SBO, who underwent laparotomy, over a period extending from August 2020 to June 2022 were selected and their records reviewed for history of ingestion/intra-operative finding of food bolus obstruction. Demographic, etiological and management patterns were noted. Descriptive analysis was done using Jamovi (version 1.6) (computer software).
Results: A total of 100 patients of food bolus obstruction were admitted and operated upon during the study period with a median age of 14 years, with 40% patients belonging to 11 to 20 years age group, with a male to female ratio of 3:1. Majority belonged to rural areas (86%). 97% cases were due to ingestion of date plum or persimmons (vernacular: "amlook"). Ileum was the most common site of impaction (63%). 90% cases were managed by fragmentation of bolus and milking of gut, whereas enterotomy and resection-anastomosis were performed in 5 patients each.
Conclusions: Food bolus obstruction especially due to phytobezoars of *Diospyros lotus* (date plum or "Amlook") is often encountered in our setup, especially in rural populations, predominantly affecting male children and adolescents.

Keywords: Food bolus, Small bowel obstruction, Phytobezoar, Persimmons

INTRODUCTION

SBO is a common surgical emergency, with majority of cases being due to adhesions or bands, especially as a complication of previous abdominal surgery. Hernias, malignancy, tuberculosis, worm infestation and Crohn's disease are other common causes.[1-3] Obstruction due to food material is uncommon, with various authors reporting the incidence between 0.3% to 6%.[4-6]

Bezoars are masses of foreign matter found in the gastrointestinal tract. The word 'bezoar' derives either from the Arabic term 'badzehr' or the Persian word 'padzahr', both of which denote counterpoison or antidote. The first diagnosis of phytobezoar in humans was described on autopsy of a patient who died from gastric perforation and peritonitis.[7,8] Bezoars are classified into four types according to their main constituents: trichobezoars, lactobezoars, pharmacobezoars and phytobezoars. Phytobezoars are the most common type of bezoars found in the alimentary tract and are formed of food fibers indigestible by humans (cellulose, hemicellulose, lignin and fruit tannins). Among phytobezoars, the most common cause worldwide is the fruit and seeds of *Diospyros sp.* (date

plum). The term diospyrobezoar was suggested by DeBakey et al for concretions of persimmon origin in the gastrointestinal tract after a review of 311 collected cases of bezoars.[9,10]

The persimmon skin contains shiboul, a cement substance, which is precipitated by the acid in the stomach and agglutinates the seeds and fibres into a bezoar. Obstruction due to this agent often becomes manifest long after eating persimmons.[11,12]

Previous gastric resection and bypass, diabetes, massive ingestion of fruits and seeds (especially persimmons, excess fiber intake, neuropathies, incomplete mastication have been implicated as predisposing factors in pathogenesis of food bolus obstruction.[13,14]

With this study, our aim was to delineate the demographic, etiological and management characteristics of such food bolus obstruction cases in our setup.

METHODS

The study entailed a retrospective review, conducted in the department of surgery of Government Medical College, Jammu, Jammu and Kashmir, India. After taking informed written consent for inclusion in the study and due clearance from the institutional ethics committee (IEC), we reviewed the records of patients who had undergone emergency laparotomy in surgical emergency of our department during the period extending from August 2020 to June 2022 and identified those with history of ingestion/intraoperative diagnosis of food bolus obstruction. A total of 100 such patients were identified. Their records were studied for relevant history, demographic data, etiological and predisposing factors, and diagnostic and treatment modalities used. Descriptive statistical analysis was done using Jamovi (version 1.6) (computer software).

Inclusion criteria

All patients of acute SBO who underwent laparotomy with history of ingestion of predisposing food stuffs or intraoperative finding of food bolus obstructing the small bowel were included in the study.

Exclusion criteria

Patients managed non-operatively and/or any other etiology identified on imaging and/or intra-operatively were excluded.

RESULTS

A total of 100 patients were studied as cases of SBO due to food bolus.

Most patients belonged to 11-20 and 0-10 years age group (40.00% and 31% respectively) with a mean age of 20.1 years and median age of 14 years. The patients ranged from 2.5 to 80 years old.

Table 1: Age distributions of patients.

Age group (years)	Number of patients	Percentage
0-10	31	31.00
11-20	40	40.00
21-30	14	14.00
31-40	5	5.00
41-50	2	2.00
51-60	1	1.00
61-70	3	3.00
71-80	4	4.00
Total	100	100

Table 2: Distribution of patients by residence and material ingested.

Residence	Ingested material		
Residence	Persimmons	Guava	Total
Rural	86	0	86
Urban	11	3	14
Total	97	3	100

Table 3: Site of obstruction.

Site of obstruction	Number of patients	Percentage
Ileum	63	63.00
Ileo-cecal junction	29	29.00
Jejunum	8	8
Total	100	100

75 patients were male and 25 were female, with male preponderance of 3:1.

86% patients resided in rural areas and 14% in urban areas.

Persimmon/date plum/amlook was the predominant cause of obstruction (97%) with 3 patients having obstruction due to guava seeds.

All rural-dwelling and 11 urban-dwelling patients had history of persimmon ingestion.

Most common site of obstruction was the ileum (63%), followed by ileo-cecal junction (29%) and jejunum (8%), with a mean distance from ileo-cecal junction of 52.3 cm (ranging from 10-120 cm).

90 patients were managed with manual fragmentation of food bolus and milking it past the ileo-cecal valve. 5 patients underwent enterotomy and 5 were treated with resection anastomosis of the involved segment (5% each).

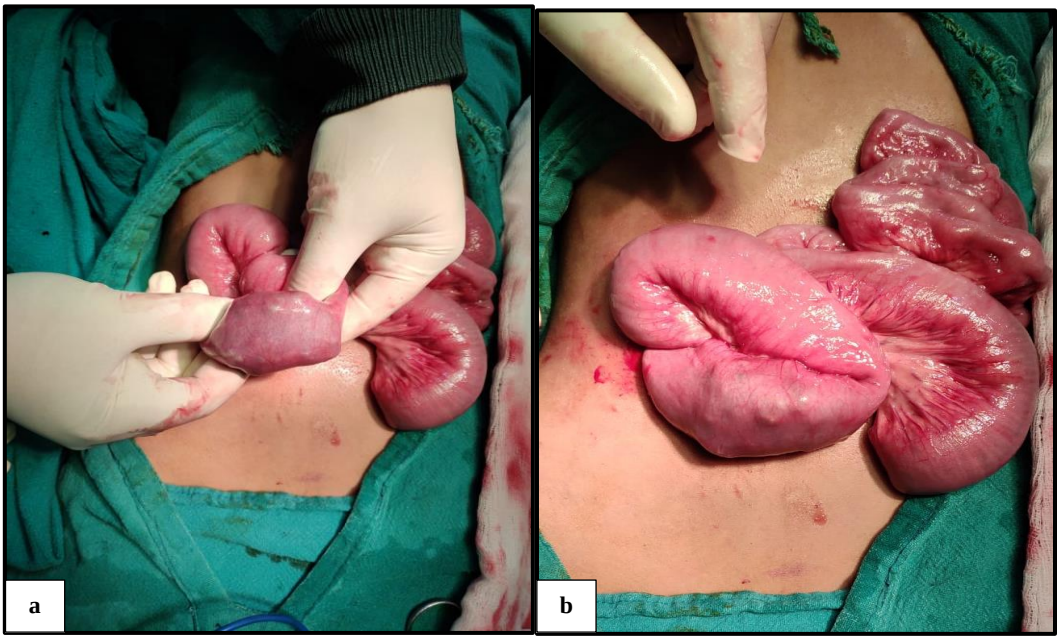

Figure 1: (a) Food bolus comprising seeds and fibers of persimmon fruit visible at site of impaction in proximal ileum, with distended proximal and collapsed distal bowel (left); (b) food bolus being fragmented and milked (right).

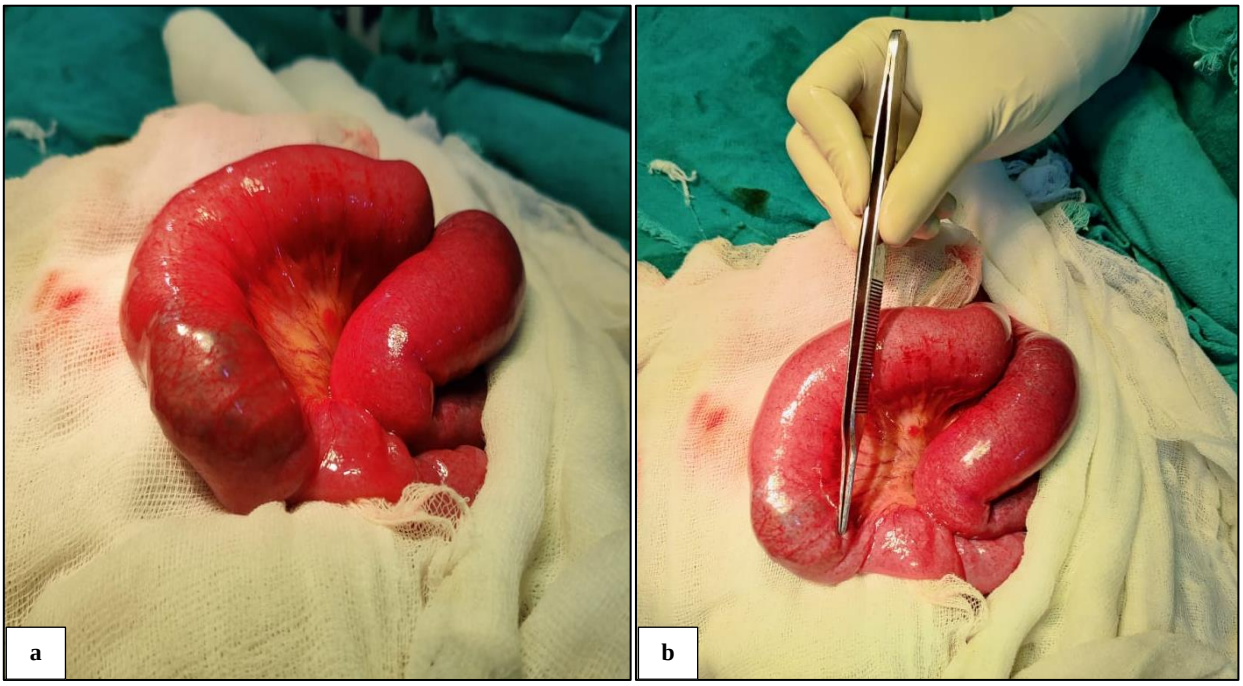

Figure 2: (a and b) Food bolus impacted near ileo-cecal junction causing stretching of the overlying bowel wall and proximal bowel distension.

DISCUSSION

SBO is a common emergency surgical entity. In this study, we explored the demographic, etiopathological and management characteristics of 60 patients with SBO due to food bolus impaction presenting to us over a period of one year who underwent laparotomy.

In the present study, mean age was 20.1 years with a median age of 14 years, with majority belonging to 0-10 and 11-20 years age groups. We had 7 elderly patients (age >60 years) in our study. Similar preponderance of food bolus obstruction in pediatric population was reported from the same hospital by Hussain et al in 2015. O'Leary 1953 also reported incidence of diospyrobezoar

obstruction in second decade, while noting that other studies have shown higher incidence in elderly populations, probably due to poor bowel motility and edentulous state leading to improper mastication.[12,15,16] The higher incidence in pediatric population was some series may be attributed to unsupervised ingestion of large number of persimmons and other fruit/plant matter or foreign bodies.[16]

There was a male to female ratio of 3:1, with 75% patients being males and 25% being females. This pattern had been noted in previous studies too and had been attributed to the fact that males were more likely to venture into the wilderness gathering and consuming such fruits.[12,15-17]

Most patients in our study belonged to rural areas (86%) and 97% had history of persimmon (date plum or amlook) ingestion. All rural and 11 of the urban dwelling patients had history of ingestion of this fruit. This can be accounted for by the geographical distribution of trees of this species in the mountainous rural stretches found in our region and the local dietary and cultural habits. That diospyros fruit ingestion was the most common cause of food bolus SBO in areas of its natural geographical distribution, had already been established in multiple other studies.[7,8,12,14-17]

Ileum and ileo-cecal junction were the most common sites of impaction of food bolus in our study of 100 patients (63% and 29% respectively). Ileum being one of the narrowest parts of the alimentary tract, especially in its distal portion, was more prone to food bolus impaction and similar distribution had been noted in other studies also.[12,16]

Out of a total of 100 patients, 90 were managed by manual fragmentation of bolus and milking of gut, in order to sweep it across the ileo-cecal valve, into the cecum. Enterotomy and removal of food bolus was performed in 5 patients and resection anastomosis was needed in 5 patients as well.

Although some authors suggested that milking may produce prolonged ileus due to bowel handling, we did not encounter such complication in our patients and wherever possible milking was tried as primary method of relieving the obstruction, with enterotomy or resection being done where milking was not possible or failed (multiple strictures, inability to manually fragment the bolus, unhealthy bowel).[9,12] Similar approach had been reported by others.[12,14,16]

With advances in minimally invasive techniques, laparoscopic treatment of food bolus obstruction had become a viable option, with early resumption of function and shorter hospital stay and less postoperative pain as compared to open techniques and may be used wherever infrastructure and expertise for emergency laparoscopy in such cases was available and patient physiology permitted its use. UGI endoscopy may also be used for removal of concomitant gastric phytobezoars with or without mechanical/chemical disintegration.[16,18]

Our study may be limited in assessing the true incidence of food bolus obstruction, since only operatively managed cases of SBO were included in our study, while a number of such patients may have been managed conservatively, which we excluded. We also could not compare the outcomes of different treatment modalities. Similarly, we did not control for the presence of any systemic comorbidities or intra-abdominal pathologies which might predispose to food bolus obstruction and/or significantly affect treatment outcome. Studies with larger sample size and comparative analysis are needed for such conclusions.

CONCLUSION

We conclude that food bolus obstruction, although uncommon should always be considered as a differential diagnosis of acute SBO, especially in male pediatric and adolescent patients and those with virgin abdomen, more so in areas with geographical distribution of diospyros trees, whose fruit (persimmon/date plum/amlook), remains the most common cause of food bolus obstruction.

Most patients can be managed by milking of the food bolus during laparotomy, with enterotomy and/or resection needed in difficult cases only. Laparoscopic treatment, if available, can be modality of choice in experienced hands.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Janež J. Bolus ileus-an occasional cause of small bowel obstruction-case report. Int J Res Med Sci. 2017;5(12):5447-9.
2. Kulaylat MN, Doerr RJ. Small bowel obstruction. In: Holzheimer RG, Mannick JA, eds. Surgical treatment: evidence-based and problem-oriented. Munich: Zuckschwerdt; 2001.
3. Smerieri N, Barbieri I, Fumagalli M, Luppi D. A rare cause of mechanical bowel obstruction: ingested vinyl glove. Unexpected diagnosis at laparoscopy. Clin Case Rep. 2017;5(6):1026-7.
4. Davies DGL, Lewis RH. Food obstruction of the small intestine. Br Med J. 1959;2(5151):545-8.
5. Bevan P. Acute intestinal obstruction in the adult. Br J Hosp Med. 1982;28(3):258-65.
6. Vellar DJ, Veller ID, Pucius R, Steedmon PK. Phytobezoars-an overlooked cause of small bowel obstruction following vagotomy and drainage

operations for duodenal ulcer. Aust N ZJ Surg. 1986;56(8):635-8.
7. DeBakey M, Oschner A. Bezoars and concretions. Surgery. 1938;4(1):934-63.
8. DeBakey M, Oschner A. Bezoars and concretions. Surgery. 1938;4(1):934-63.
9. Storck A, Rothschild JE, Ochsner A. Intestinal obstruction due to intraluminal foreign bodies. Ann Surg. 1939;109(5):844-61.
10. Cain GB, Moore P, Patterson M. Bezoars-a complication of the post-gastrectomy state. Am J Dig Dis. 1968;13:801-9.
11. Izumi S, Isioa K, Iwamoto M. The mechanism of the formation of phytobezoars with special reference to the persimmon ball. Jpn J Med Sci Biochem. 1933;2:21-35.
12. Ward-McQuaid N. Intestinal obstruction due to food. Br Med J. 1950;1(4662):1106-9.
13. Krausz MM, Moriel EZ, Ayalon A, Pode D, Durst AL. Surgical aspects of gastrointestinal persimmon phytobezoar treatment. Am J Surg. 1986;152(5):526-30.
14. Chisholm EM, Chung SCS, Leong HT. Phytobezoar: an uncommon cause of small bowel obstruction. Ann R Coll Surg Engl. 1992;74(5):342-4.
15. O'Leary CM. Diospyrobezoar: A review of fourteen cases with an analysis of forty-six collected cases from the literature. AMA Arch Surg. 1953;66(6):857-68.
16. Hussain Z, Singh V, Mattoo S, Rasool A, Kumar B, Kachroo SL. Diospyrobezoar induced small bowel obstruction in Children. JEMDS. 2015;4(34):5906-12.
17. Newburger B. Intestinal obstruction due to phytobezoar. Rev. Gastroenterol. 1941;3(8):293.
18. Yau KK, Siu WT, Law BKB, Cheung HYS, Ha JPY, Li MKW. Laparoscopic approach compared with conventional open approach for bezoar-induced small-bowel obstruction. Arch Surg. 2005;140(10):972-5.

Cite this article as: Naqvi RH, Gupta A, Khokher B, Dhar S, Gupta S. Prospect of food bolus obstruction in a tertiary care hospital. Int Surg J 2022;9:1572-6.