

## Case Report

# A fruity bowel obstruction: ingested dehydrated apple as a cause for small bowel obstruction

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### ABSTRACT

Small bowel obstructions are common acute surgical presentations often as a result of intraabdominal adhesions or herniations; rarer causes include malignancies, strictures, foreign bodies and bezoars. Phytobezoars (bezoars composed of undigested plant material) account for <4% of small bowel obstructions. Here we report an unusual case of a 56-year-old male with a virgin abdomen presenting with a small bowel obstruction, a CT scan of his abdomen and pelvis was suggestive of a closed loop small bowel obstruction. The patient progressed to have an emergency laparotomy and was found to have multiple intraluminal obstructing foreign bodies within the distal ileum. On making an enterotomy to remove and examine these, they were found to be rehydrated apple segments that the patient had ingested in the dehydrated form several hours earlier. This is an example of a phytobezoar causing bowel obstruction, contributing factors to the occurrence of these include poor gastrointestinal motility and problems of mastication; in this instance the patient had poor dentition that likely pre-disposed him to this problem.

**Keywords:** Small bowel obstruction, Phytobezoar, bezoar, Dehydrated fruit, Apple, Acute abdomen

### INTRODUCTION

Small bowel obstruction is a prevalent acute surgical presentation with common aetiologies been intraabdominal adhesions, herniation through body cavities and less commonly from inflammatory bowel strictures, small bowel malignancy and foreign bodies including bezoars and phytobezoars (bezoars composed of undigested plant material). In the context of a virgin abdomen without obvious evidence of external herniation raises the likelihood of these rarer causes.<sup>1</sup>

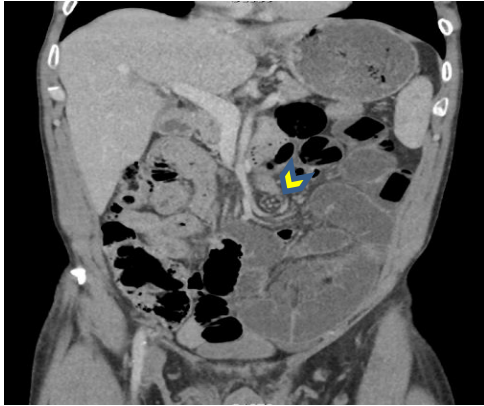
Here we present an unusual case of patient with a virgin abdomen attending hospital with an acute abdomen and CT proven small bowel obstruction that turned out to be secondary to ingestion of dehydrated apple that rehydrated within the small bowel resulting in a distal small bowel obstruction.

### CASE REPORT

A 56-year-old male presented to the emergency department with acute onset central colicky abdominal pain with associated abdominal distention without vomiting, he had a history of intravenous drug use, was HIV positive, and had a virgin abdomen. Clinically he was hypothermic to 35.8 degrees with rigors, he had normal haemodynamics, and a distended abdomen with localised peritonism. A CT scan (Figure 1) was suggestive of a closed loop small bowel obstruction as a result of an internal hernia and bowel volvulus. Given these findings there was concern for evolving bowel ischemia and the need for urgent exploration.

After urgent transfer to theatre laparoscopy found a moderate amount of free fluid, grossly distended small bowel and poor laparoscopic working space. After

conversion to laparotomy the small bowel was delivered and inspected. There were multiple transition points along the distal ileum as a result of the intraluminal contents, which varied in size and shape (Figure 2). An enterotomy was made and the obstructing bodies removed. On closer examination these were multiple pieces of fruit (Figure 3).



**Figure 1: Contrast CT in coronal plane demonstrating dilated loops of small bowel with mesenteric swirl (yellow arrow) but no radio-opaque intraluminal obstruction.**



**Figure 2: Intraoperative image of small bowel with sausage shaped intraluminal obstruction (white arrows).**



**Figure 3: Operative specimen of multiple pieces of apple milked from small bowel.**

The patient was questioned in retrospect and he advised that he had ingested multiple pieces of dehydrated apple approximately 10-12 hours preceding his onset of symptoms. Post operatively he experienced ileus but had an otherwise uneventful recovery and was discharged day 7 post operatively.

## DISCUSSION

Phytobezoars are an accumulation of indigestible plant material within the bowel, they are a rare cause of small bowel obstruction accounting for less than 4% of cases.<sup>2,3</sup> Typically, they occur in people with poor gastrointestinal motility or problems of mastication; conditions including Guillain-Barre syndrome, hypothyroidism, post truncal vagotomy and poor dentition.<sup>3,4</sup>

Dehydrated fruits have been described in cases to result in small bowel obstruction however they are rare. Previously described cases include dehydrated apple and apricot. The likely underlying mechanism of them causing small bowel obstruction is the high cellulose content as per all phytobezoars with the capability to absorb large quantities of water with subsequent rapid expansion in size and then luminal obstruction of the bowel.<sup>5,6</sup> One experimental study looked at the rate of expansion of dehydrated apple and found they can increase their dehydrated diameter by up to 35%.<sup>6</sup>

Diagnosing dehydrated fruit and phytobezoars as a cause of small bowel obstruction is challenging. Although CT is useful at demonstrating a small bowel obstruction and associated complications, and probable transition points it is poor at specifically demonstrating phytobezoars. They often have an appearance similar to faeces. Tell-tale signs to differentiate the two are vague; these may include a phytobezoar been a well-defined oval (rather than elongated) intraluminal mass with gas in its interstices in context of phytobezoars that have formed over a period of time.<sup>7</sup> Dehydrated fruit that has absorbed large amounts of water will be radiolucent and unlikely to be visible on CT and therefore non diagnostic.

Ultrasound maybe more sensitive in select patient groups with some reports of ultrasound demonstrating intraluminal obstruction in paediatric cases from rehydrated peaches.<sup>8</sup> Nevertheless, this modality has limitations secondary to patient body habitus, availability and findings are not specific outside of the context of a consistent clinical history.

The most important note from this case is that in order to pre-operatively diagnose dehydrated fruit and other phytobezoars as a cause of small bowel obstruction a high index of suspicion is required as clinical examination and imaging are not specific to this underlying cause. This would include identifying risk factors as discussed above and specifically asking about the consumption of dehydrated food products which a patient may not reveal otherwise.

In this case a pre-operative diagnosis would not have altered management given the presentation and operative intervention was indicated. Medical interventions can be trialled with gastric bezoars including dissolution therapy with carbonated drinks or cellulase however these would likely be ineffective in distal obstructions.<sup>9</sup>

## CONCLUSION

Small bowel obstructions are common surgical presentation and most commonly will be a result of intrabdominal adhesions or herniations. Rarer aetiologies such as phytobezoars and specifically in this case dehydrated fruits require a high index of suspicion and a careful clinical history to establish them as an underlying cause.

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