

# The Perils of Passover: Small Bowel Obstruction from a Matzah Bezoar

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**B**ezoar obstruction accounts for 3–4% of all causes of small bowel obstruction. Predisposing factors include gastric stasis or dysmotility, an edentulous state, and disorders of mastication. We treated an otherwise healthy male with an acute abdomen, complete small bowel obstruction, and significant acidosis caused by overindulgence of *matzah*, a traditional food eaten during Passover, an 8 day Jewish religious holiday. We report the specifics, review the literature and make recommendations to suspect this entity.

## PATIENT DESCRIPTION

A 68 year old male, otherwise healthy, presented to the emergency room with

a 2 day history of mid-abdominal pain, increasing in intensity and associated with nausea and vomiting. In the emergency room, his hemodynamic status was stable and the abdomen was mildly distended and tender in the mid-abdomen. Abnormal laboratory tests included leukocytosis of 15.9 and hemoglobin concentration of 19.2. There was marked metabolic acidosis, with pH 7.37 and lactic acid 6.8. A computed tomography scan [Figure A] revealed a dilated proximal and mid-small bowel, an intraluminal mass, and a collapsed bowel distal to this point.

After obtaining consent, abdominal surgery was performed. An initial laparoscopic examination showed small bowel dilatation with diffuse patchy hemorrhagic changes on the serosa and mesenteric border throughout the dilated small bowel. The operation was converted to an open procedure, and a mass completely obstructing the mid-ileum was palpated. Suspecting a bezoar, manual disimpaction was attempted without success. Because of

concern of an ischemic segment, a resection of the segment of ileum was done with an ileoileostomy. The procedure was well tolerated, the acidosis was corrected, and after an uneventful 5 day convalescence he was discharged and remains well. The opened specimen [Figure B] showed an impacted matzah bezoar.

## COMMENT

The term bezoar has its origins in ancient Persian and Arabic languages and means antidote. It was found in the stomach of goats and ruminants and was formed from undigested vegetable or fruit fiber. The bezoar “stone” was a valuable possession and was used for seven centuries as a medicinal remedy and as an antidote for poison [1].

Bezoars may form de novo but are more common after gastric surgery, particularly after vagotomy, which lowers gastric acid and may alter motility and emptying. The incidence of bezoars after gastric surgery is 5–12% [2]. In a series of 43 small bowel bezoars, gastric surgery preceded bezoar formation in 65%, and 88% were edentulous. In other reports, chewing or swallowing disorders coexisted in a quarter of the bezoars detected. Other causes of delayed gastric emptying and predisposition to bezoar formation include diabetes, hypothyroidism and Guillain-Barre syndrome [3]. Most bezoars form in the stomach, and when they enter the small bowel they may pass or cause partial or complete obstruction. This depends on their size and the luminal diameter of the small bowel. The narrowest part of the small bowel is within the distal 75 cm of ileum, and many bezoars obstruct there [4].



**[A]** CT scan revealing dilated loops of small intestine with air fluid levels and a transition point (white arrow) in the mid-abdomen



**[B]** Opened pathologic specimen with impacted matzah bezoar and resected intestinal segment

Matzah has not been reported as an obstructing bezoar but undoubtedly has been an unreported contributor. Our patient observed the dietary restrictions of Passover. The five commonly eaten grains – wheat, spelt, barley, oats, and rye – are forbidden except for matzah. Matzah is baked with flour and water for less than 18 minutes, obviating its rising, softening or leavening. Therefore, it becomes flat, hard and more difficult to digest in the stomach.

On presentation to the emergency room the patient was acutely ill. In view of the CT findings and marked acidosis, surgery was indicated. When possible, manipulation and fragmentation of the bezoar and milking it to the cecum is advised. If that fails and the bowel is not compromised, an enterotomy with extrac-

tion is suggested; finally, if perforation or ischemia is a concern a segmental resection of the involved portion is required.

The unusual features of this case were the cause (matzah), the relatively short time of ingestion to onset (2 days), the absence of predisposing and associated conditions (disorders of mastication, an edentulous state, or gastric surgery), and the severity of obstruction (acidosis, bowel dilatation and ischemia).

In conclusion, an uncommon case of complete small bowel obstruction, necessitating a segmental ileal resection, caused by a matzah bezoar is reported. The relatively short time of ingestion (2 days) suggests that overindulgence of matzah at Passover has unintended and unreported consequences.

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### Capsule

#### Humans can discriminate more than 1 trillion olfactory stimuli

Humans can discriminate several million different colors and almost half a million different tones, but the number of discriminable olfactory stimuli remains unknown. The lay and scientific literature typically claims that humans can discriminate 10,000 odors, but this number has never been empirically validated. Bushdid et al. determined the resolution of the human sense of smell by testing the capacity of humans to discriminate odor mixtures with varying numbers of shared components. On the basis of the results

of psychophysical testing, they calculated that humans can discriminate at least 1 trillion olfactory stimuli. This is far more than previous estimates of distinguishable olfactory stimuli. It demonstrates that the human olfactory system, with its hundreds of different olfactory receptors, far outperforms the other senses in the number of physically different stimuli it can discriminate.

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### Capsule

#### A randomized trial of hyperimmune globulin to prevent congenital cytomegalovirus

Congenital infection with human cytomegalovirus (CMV) is a major cause of morbidity and mortality. In an uncontrolled study published in 2005, administration of CMV-specific hyperimmune globulin to pregnant women with primary CMV infection significantly reduced the rate of intrauterine transmission, from 40% to 16%. Revello et al. evaluated the efficacy of hyperimmune globulin in a phase 2, randomized, placebo-controlled, double-blind study. A total of 123 women could be evaluated in the efficacy analysis (1 woman in the placebo group withdrew). The rate of congenital infection was 30% (18 fetuses or infants of 61 women) in the hyperimmune globulin group and 44% (27 fetuses or infants of 62 women) in the placebo group (a difference of 14 percentage points; 95% confidence interval -3 to 31,  $P = 0.13$ ). There was no

significant difference between the two groups or within each group, between the women who transmitted the virus and those who did not, with respect to levels of virus-specific antibodies, T cell-mediated immune response, and viral DNA in the blood. The clinical outcome of congenital infection at birth was similar in the two groups. The number of obstetric adverse events was higher in the hyperimmune globulin group than in the placebo group (13% vs. 2%). The authors conclude that in this study of 123 women who could be evaluated, treatment with hyperimmune globulin did not significantly modify the course of primary CMV infection during pregnancy.

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