

## Esophageal Obstruction After Ingestion of a Fiber-Containing Diet Pill

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**Foreign bodies of the esophagus in adults may be the result of a food bolus that becomes lodged proximal to a structural abnormality of the distal esophagus. A case of peptic stricture of the esophagus in a patient who presented with acute dysphagia after ingesting an over-the-counter diet pill composed of guar gum is discussed. It is recommended that anorectics composed of dietary fiber should not be used in patients with a history of esophageal stricture.**

Esophageal foreign bodies in adults most commonly result from the impaction of meat and other food stuffs (1). They may be the result of an underlying anatomical abnormality such as benign peptic strictures, esophagitis, and hiatal hernias (1). Imbibing alcohol and the presence of dental prosthesis are additional risk factors for food bolus impaction because of inadequate mastication and impairment of oropharyngeal sensation. One might expect esophageal malignancy to be commonly associated with foreign bodies of the esophagus; however, this is often not the case (2). This problem may also be seen in psychiatric patients and prisoners; in many of these instances the foreign bodies are truly "foreign." In this latter group and in alcoholics, a host of objects have been reported, including coins, pins, dental prostheses, tooth picks, and bottle caps (3,4).

Medications, on the other hand, rarely cause symptomatic esophageal obstruction. More commonly, medicinals cause erosion and ulceration of the esophageal mucosa which is asymptomatic in most patients, but may lead to odynophagia, retrosternal pain, and dysphagia (5). Failure to consume an adequate amount of fluid or lying in the supine position while taking medicinals are the most common factors associated with pill-induced injury. Prolonged retention within the esophagus may also occur in the presence of a hiatal hernia, stricture, or dysmotility. Antibiotics, especially doxycycline, account for most pill-induced

lesions; however, many other commonly prescribed medications have also been involved, including potassium chloride tablets, ferrous sulfate, quinine, and nonsteroidal antiinflammatory drugs (6). Esophageal obstruction as a result of medicinals is a rare event; the current report describes a case of esophageal obstruction caused by an over-the-counter appetite suppressant tablet which expanded on contact with liquid.

### Case Report

A 70-year-old male Baptist minister was admitted to the emergency ward with sudden onset of inability to swallow. For 6 years he had noticed nonprogressive dysphagia to incompletely chewed solid food which occurred half a dozen times per year. Barium swallow and esophageal manometry had been performed 5 years earlier at another institution; they were notable for the presence of a hiatal hernia. Two days before admission, the patient began to take an over-the-counter anorectic, Calban 3000 (Anderson Pharmaceuticals, Lutz, FL), in hopes of losing several pounds. On the morning of admission, he took three Calban 3000 tablets with a glass of water 15 minutes before breakfast and on eating two spoonfuls of bran flakes experienced an inability to swallow food or saliva. There was no history of alcohol or tobacco consumption.

The patient's medical history was significant for hypertension and gout, for which he took atenolol and sulfinpyrazone, respectively. Review of systems was remarkable for heartburn and regurgitation no greater than two times per year.

Examination showed a robust-appearing white male without apparent distress. His temperature was 36.8°C, pulse 60 beats/min, respiratory rate 16 breaths/min, and blood pressure 138/80 mm Hg. His dentition was good and his neck was supple without tracheal deviation. Cardiovascular and pulmonary examination showed no abnormality. The pa-

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Abbreviation used in this paper: MCV, mean corpuscular volume.

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tient's abdomen was soft and nontender with normoactive bowel sound and no organomegaly. Rectal examination revealed modest prostatic enlargement and brown, hemocult-negative stool. Neurological examination showed no abnormality.

The hemoglobin count was 14.6 g/dL (146 g/L) with mean corpuscular volume (MCV) 103; white blood count 14,700/mm<sup>3</sup> (14.7 10<sup>9</sup>/L) with 78% neutrophils, 2% band forms, 13% lymphocytes, and 7% monocytes; and the platelet count was 210,000/mm<sup>3</sup>. Prothrombin time and the activated partial thromboplastin time were 12.0 and 29.6 seconds, respectively. Sodium level was 138 mmol/L (138 mEq/L); potassium, 5.0 mmol/L (5.0 mEq/L); chloride, 104 mmol/L (104 mEq/L); bicarbonate, 24.2 mmol/L; blood urea nitrogen 6.5 mmol/L (18.2 mg/dL); creatinine, 106 μmol/L (1.19 mg/dL); and glucose 7.7 mmol/L (138 mg/dL). X-ray film of the chest and electrocardiogram showed no abnormality.

In the emergency ward, a barium swallow showed a high-grade obstruction caused by a lesion measuring 2 × 3 cm lying in the distal esophagus (Figure 1A). The esophagus proximal to the lesion was mildly dilated with normal peristalsis and scant tertiary contractions. Just distal to the mass, an irregular stricture 4 cm in length led into a small hiatal hernia. Only a scant amount of barium was noted to pass the mass lesion. Sequential doses of sublingual nitroglycerin, 0.4 mg; sublingual nifedipine, 10 mg; and SC glucagon, 1 ampule, did not relieve the esophageal symptoms.

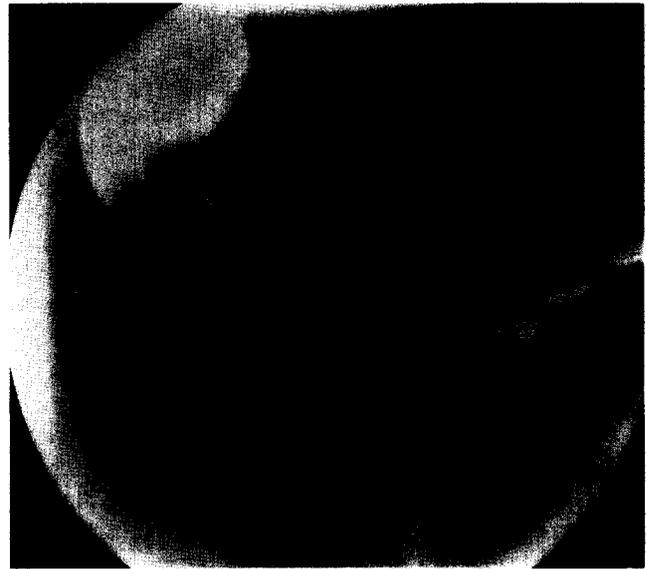
Esophagogastroduodenoscopy was performed using an Olympus GIF V10 endoscope (Olympus Corp., Lake Success, NY) after conscious sedation with 3 mg of midazolam and 60 mg of meperidine IV. A large white gelatinous mass was encountered 37 cm from the incisors and was readily broken up with a polypectomy snare and passed into the stomach with the tip of the endoscope. A stricture of the esophagus between 41 cm and 45 cm was present; no mass of tumor was seen. The remainder of the exam showed no abnormality. Under direct vision, a flexible guide wire was placed into the stomach, and 33, 36, and 48 French Savary dilators (Wilson-Cook, Winston-Salem, NC) were advanced past the region of stricture using the Seldinger technique. The patient tolerated the procedure well. Repeat contrast examination of the esophagus showed increased patency of the lumen in the region of the stricture but continued irregularity of the mucosa (Figure 1B). There was no extravasation of barium.

The patient was discharged after tolerating clear liquids and was instructed to have follow-up evaluation by his personal gastroenterologist.

### Discussion

Calban 3000 is a guar gum composed of the endosperm of *Cyanopsis tetragonolopus*. To our knowledge, this is the first case of esophageal obstruction due to an expanding foreign body.

Esophageal foreign bodies should be removed within 24 hours to avoid the risk of aspiration pneumonia, airway obstruction, penetration of the esophageal wall, perforation or fistulization to surrounding structures, and local or systemic infections (7). Flexible fiberoptic esophagoscopy is the procedure of choice



**Figure 1.** A. Barium esophagram demonstrating a distal esophageal stricture (small arrow) with irregular mucosa, mild prestenotic dilatation, and an impacted foreign body (large arrow).

B. Barium esophagram after removal of the impacted Calban 3000 tablet and bouginage of the peptic stricture. Esophageal dilatation is now absent and contrast moves freely into the stomach.

because of its efficacy, safety, and ability to assess underlying mucosa (8). Treatment with agents including sublingual nitroglycerine and nifedipine (9) which relax smooth muscle, subcutaneous glucagon (10) which lowers lower esophageal sphincter pressure, and gas-forming substances (11) which propel the foreign body from the esophagus into the stomach have also been reported.

Dietary fiber may be divided into three broad categories; cellulose and lignin, which are components of the cell wall of plants, and hemicelluloses, which are ground substances that include gums and mucilages (12). Fiber may be useful in a broad array of gastrointestinal (13) and metabolic disorders (14), including the irritable bowel syndrome, colon cancer prevention, constipation, diarrhea, diabetes mellitus, and certain hyperlipidemias. By and large, dietary fiber is safe; however, when taken in excess, complications including steatorrhea (15), divalent cation deficiency (Ca, Mg, and Zn), and the development of sigmoid volvulus have been recognized (12).

Several nonprescription anorectics contain plant fibers such as fruit pectins, cellulose, and soy fiber alone or in combination with phenylpropanolamine, caffeine, acetaminophen, and salicylic acid. If one considers the prevalence of real and perceived obesity in our society, it is not surprising that over-the-counter diet pills are a \$228 million/year industry. When used as part of a weight-reduction program, increasing dietary fiber theoretically results in early satiety and diminished caloric intake. Medicinals that have been reported to cause esophageal hemorrhage, stricture, penetration, and perforation rarely cause obstruction (6). Conversely, dietary fiber has been reported to cause gastrointestinal obstruction in both the small (16,17) and large (18) bowel. Obviously, the presence of an esophageal stricture and the dehydrated fiber in tablet form were predisposing factors in our patient. Certain fiber supplements have many health benefits; however, we suggest that "diet pills" that contain swelling fibers such as Calban 3000 be contraindicated in patients with a history of esophageal stricture.

## References

1. Webb WA, McDaniel L, Jones L. Foreign bodies of the upper gastrointestinal tract: current management. *South Med J* 1984;77:1083-1086.
2. Nandi P, Ong GB. Foreign body in the oesophagus: review of 2,394 cases. *Br J Surg* 1978;65:5-9.
3. Taylor RB. Esophageal foreign bodies. *Emerg Med Clin North Am* 1987;5:301-311.
4. Rottman SJ, Lindsay KL, Kuritzkes R. Of college fads, bottle caps, and esophageal obstruction (letter). *Ann Emerg Med* 1988;17:869.
5. Lewis JH. Gastrointestinal injury due to medicinal agents. *Am J Gastroenterol* 1986;81:819-834.
6. Kikendall JW, Friedman AC, Oyewole MA, Fleischer D, Johnson LF. Pill-induced esophageal injury: case reports and review of the medical literature. *Dig Dis Sci* 1983;28:174-182.
7. Chaikhouni A, Kratz JM, Crawford FA. Foreign bodies of the esophagus. *Am Surg* 1985;51:173-179.
8. Webb WA. Management of foreign bodies of the upper gastrointestinal tract. *Gastroenterology* 1988;94:204-216.
9. Bell AF, Eibling DE. Nifedipine in the treatment of distal esophageal food impaction (letter). *Arch Otolaryngol Head Neck Surg* 1988;114:682-683.
10. Marks HW, Lousteau RJ. Glucagon and esophageal meat impaction. *Arch Otolaryngol* 1979;105:367-368.
11. Rice BT, Spiegel PK, Dombrowski PJ. Acute esophageal food impaction treated by gas-forming agents. *Radiology* 1983;146:299-301.
12. Jenkins DJA. Carbohydrates: dietary fiber. In: Shils ME, Young VR, eds. *Modern nutrition in health and disease*. 8th ed. Philadelphia: Lea & Febiger, 1988:52-71.
13. Jenkins DJA. Nutrition and diet in management of diseases of the gastrointestinal tract: (1) colon (2) fiber and colonic disease. In: Shils ME, Young VR, eds. *Modern nutrition in health and disease*. 8th ed. Philadelphia: Lea & Febiger, 1988:1176-1181.
14. Jenkins DJA, Reynolds D, Slavin B, Leeds AR, Jenkins AL, Jepson EM. Dietary fiber and blood lipids: treatment of hypercholesterolemia with guar crispbread. *Am J Clin Nutr* 1980;33:575-581.
15. Levine AS, Livis SE. Steatorrhea due to high dietary fiber (abstr). *Gastroenterology* 1979;76:1183.
16. Cooper SG, Tracey EJ. Small-bowel obstruction caused by oat-bran bezoar. *N Engl J Med* 1989;320:1148-1149.
17. Allen-Mersh T, De Jode LR. Is bran useful in diverticular disease? (letter). *Br Med J* 1982;284:740.
18. Kang JY, Dow WF. Unprocessed bran causing intestinal obstruction. *Br Med J* 1979;1:1249-1250.

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