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Phytobezoar

by

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Introduction

Bezoar is a term applied to masses found in the stomach of animals and man (Allen, 1938), which were classified according to the content of the material as: (1) Trichobezoar (hair ball), (2) Phytobezoar (vegetable matter), (3) Trichophytobezoar (mixture of vegetable matter and hair), and (4) concretions (DeBakey and Ochsner, 1938). Bezoar formed by using to concentrated milk formulas, called lactobezoar, were also reported in the litterature (Wolff, 1959; Wolff, 1963; Levkoff et al., 1970; and Majd et al., 1972).

Phytobezoars were most commonly formed after ingestion of persimmon (Allen 1938; Canlas, 1953; Chont, 1942; Dann, 1959), but formation has also been described due to variety of other foodstuffs, e.g. orange, fig fibers, apple peel (Buchholz, 1972), pine-apple, dried coconut (McKechnie, 1972), prune, raisin seeds and skin (Chont, 1942). A case of bezoar consisting of cotton or woolen particles was also reported (Edell, 1971).

The present report is a case of phytobezoar, of which banana was the cause of the formation of the mass and which was removed by way of gastrostomy.

Case report

E., a 2-month-old Indonesian girl was admitted to our department on August 16, 1973 with a 7 days history of extensive vomiting, followed by diarrhea 2 days before admission.

The baby was born at-term, by breech presentation from an uneventful twin pregnancy by a doctor. Her birth weight was 2500 gm. and the body-length was 45 cm., while her twin sister who was born 6 hours earlier had a body-weight of 3200 gm. and a body-length of 48 cm. She was

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fed and did well for about 1 week on Loma 11 formula in the proportion of 2 measuring cups by volume of powdered milk to 200 ml. by volume of water. The amount of milk given was 6 to 7 times 60 ml. daily. At the age of 7 days, Loma 11 was changed to SGM also a milkformula with the same dilution, and 2 pieces of banana (pisang Ambon) a day were added to her meal. After 1 week, pisang Ambon was changed to pisang Siam which was more astringent especially when unripe. Pisang Siam was given 3 times 3 pieces a day (9 pieces a day). At the age of 1 month (4 weeks prior to admission) she began to vomit, whereas her appetite became poor. Three weeks later she got fever and vomited more frequently. Since 2 days before admission she also got diarrhea 20 times a day until she was taken to the hospital.

On admission we found a female baby of 2250 gm. with a body-length of 54 cm. She looked very ill, was apathetic, in a poor nutritional condition and severily dehydrated. The body temperature was 40° C. The pharynx was hyperemic. The heart and lungs were found to be normal. The abdomen was slightly distended, and an abdominal mass of about 3 cm. width and 7 cm. length was palpable in the upper part of the abdomen. The mass was tender and elastic on palpation and was easily movable, whereas the liver and spleen were not palpable. Hemoglobin was 13.8 g%; white blood cells 9.000/ mm^3 with 68 percent polymorphonuclears. Some leucocytes were found on stool examination.

The patient was started on intravenous fluids and got antibiotics to combat the pharyngitis. She was then referred to the Surgical Department for further consultation of the intra-abdominal tumor and no acute abdomen could be regarded. On radiological examination (August 18, 1973) a plain film of the abdomen was made revealing a dense shadow with a concave lower border in the abdomen, resembling the shadow of the stomach. The upper border coulnot be differentiated from the liver (fig. 1). The baby was then given a barium meal. As barium entered the stomach, it was observed that the barium film glided slowly downward on either side of the mass, following the regular contour of the greater and lesser curvatures (fig. 2). The barium entered the duodenum easily (fig. 3). All these pictures suggested a bezoar without any obstruction of the gastric outflow. Three days after ingestion of barium, a small amount of barium still remained in the gaster mixed with the mass. The same pictures were seen 1 week after barium-meal.

During hospitalization, the patient suffered several times from vomiting and diarrhea. Ten days after admittance, the general condition improved a little bit, but the mass was still pelpable. Because of persisting symptoms, gastrostomy was performed

on August 27, 1973. A firm, light brown gummy appearing mass was removed, weighing about 100 gm. Further exploration of the stomach revealed no abnormalities of the mucosa and the prepyloric area. The pathological report described an amorphous mass, without any definite structure. Biochemical analyses disclosed that the mass constituent was carbohydrate, namely cellulose. Judging from the absence of calcium ions in the mass, lactobezoar was excluded.

The post-operative course was uneventful, and the patient was discharged 7 days after the operation.

Discussion

The word bezoar is derived from the word "badzahr" or "padzahr", "pad" meaning protecting (against) and "zahr" meaning poison; thus a bezoar originally meant a counterpoison or antidote. In medical science the term bezoar is used to describe large concretions in the human stomach (Bockus, 1963). Quain in 1854 is said to have described the first case of phytobezoar. It consisted of coconut fiber and string. Since then, numerous case reports of phytobezoar were published in the medical literature. About 40 per cent of the reported cases of bezoars are of the phytobezoar variety (Bockus, 1963).

The mechanism of formation of phytobezoar is still obscure. Soluble shibuol, a phlobotannin composed of phloroglucine and gallic acid was identified as the alement producing astrigency in the persimmon. This substance, which is present in large amounts in the unripe fruit, is transformed under the influence of gastric acid into a sticky coagulum, insoluble shibuol, which cements the pieces of skin and seeds into a ball.

This was supported by a laboratory experiment, which proved that hydrochloric acid is essential for the formation of persimmon bezoars (Chont, 1942). However, disintegration of a phytobezoar by a stimulating proteolytic action of hydochloric acid, which dissolves the vegetable cement substances was also reported (Hart, 1923). Most of the phytobezoars in adults so far reported, were patients after gastrectomy or gastric surgery (Cohen, 1971; McKechnie, 1972; Buchholz et al., 1972).

Cohen stated that surgery interfered with the mechanial and acid secreting mechanisms of the gastrointestinal tract causing the formation of bezoar. Buchholz added some factors in the etiology of obstruction in connection with bezoar formation such as physical characteristics of the bolus, condition of the chewing mechanism, and nature of foodstuffs involved. Duodenal stenosis contributing to bezoar formation has been repor ted in a 16-month old white boy (Edell, 1971).

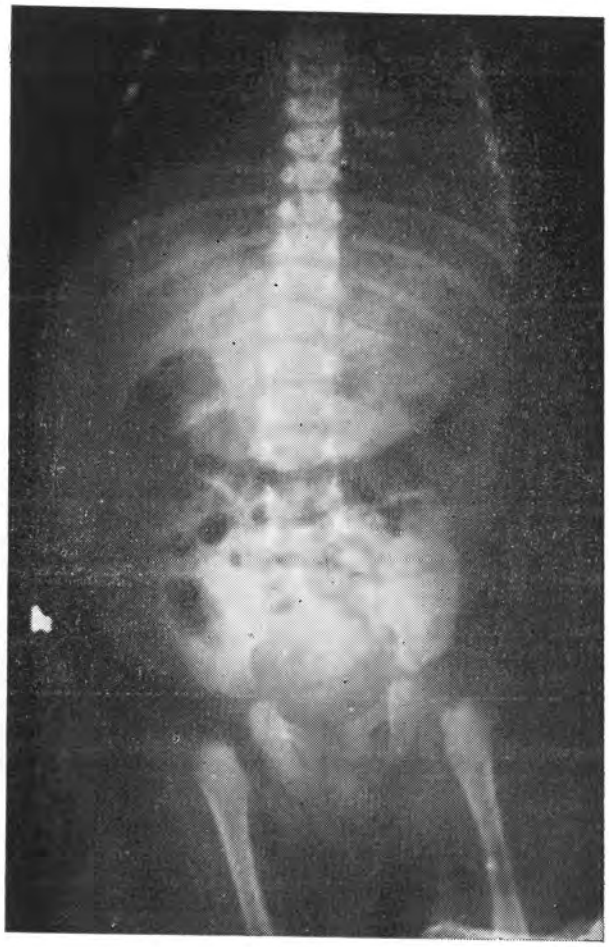

FIG. 1 : *A plain film of the abdomen in upright position showed a dense mass the mid- abdomen. The upper border couldn't be differentiated from the liver, but the concave lower border resembled the shadow of the stomach.*

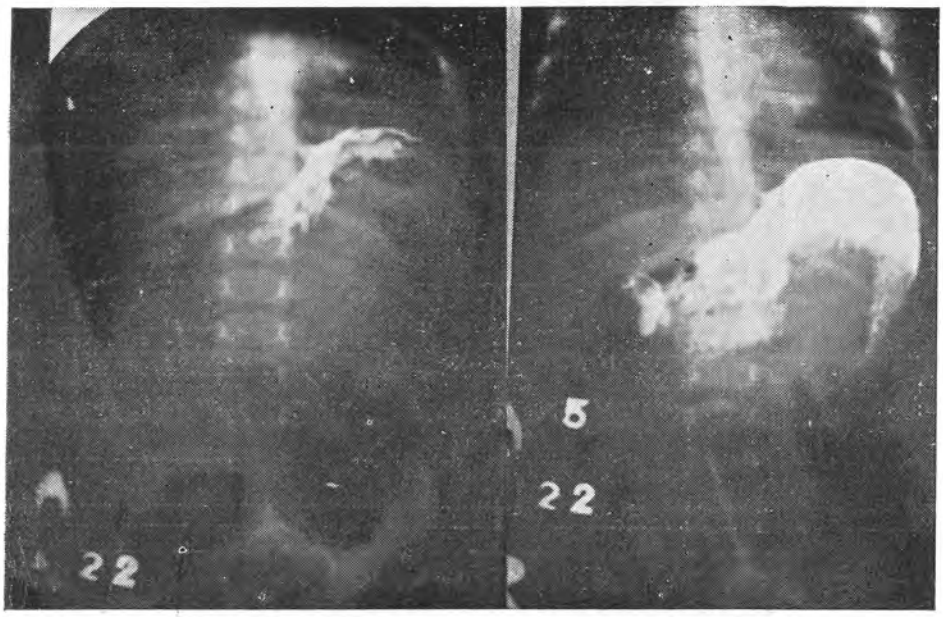

FIG. 2 : *After 5 minutes the barium film spread on either side of the mass and formed a cap covering the upper portion of the mass.*

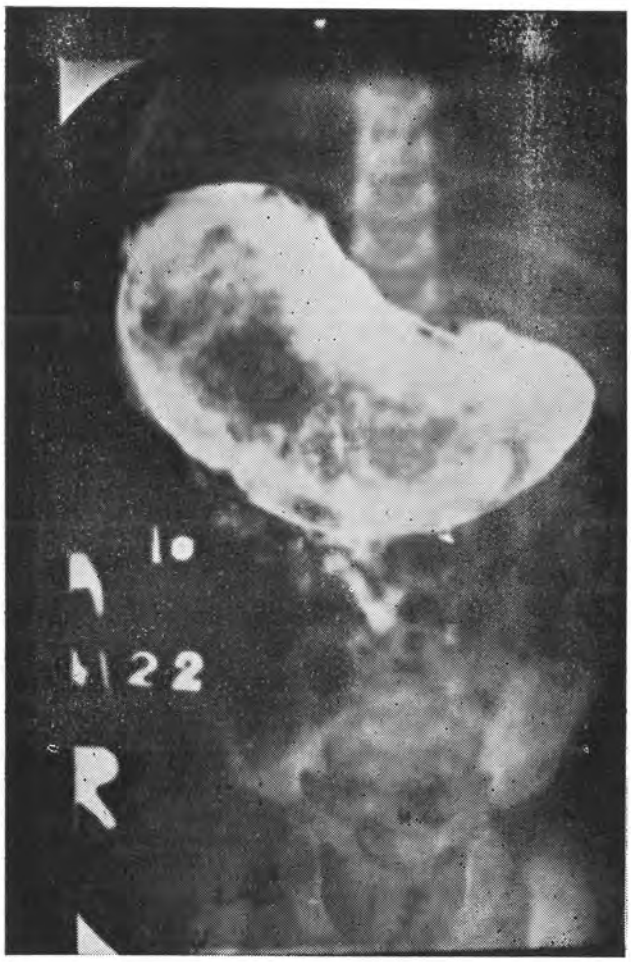

FIG. 3 : *After 10 minutes the bezoar was clearly outlined by a big central defect surrounded by contrast material along the greater and lesser curvature between the mass and the stomach walls.*

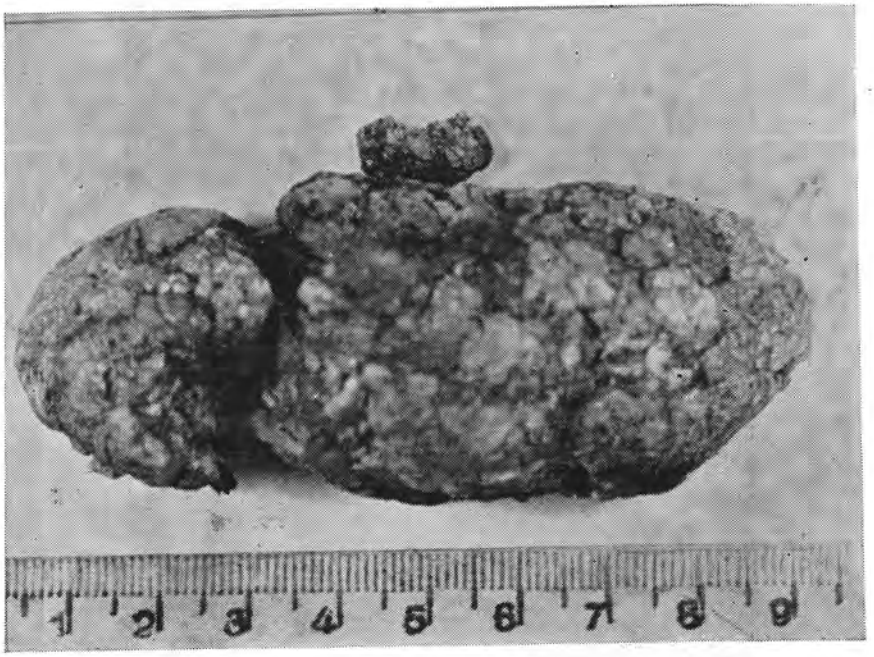

FIG. 4 : *The bezoar after removal from the stomach.*

The symptoms are those of an acute gastroenteritis of a severe type. Attacks of diarrhea alternating with constipation of an obstinate type are common (Hart, 1923). The usual complaints are a vague fullness, gas, nausea and vomiting, paroxysms of upper abdominal pain, and the sensation of a lump in the upper abdomen (Allen, 1938). Very often the patient remains comparatively symptom-free for months or even several years thereafter. The symptoms to be anticipated from the foreign body itself will obviously depend upon its size, location and the degree of dis turbance of gastric physiology (Bockus, 1963).

A reliable diagnosis can be made by the characteristic roentgenographic findings. A plain film of the abdomen shows a dense area in the epigastric region (Canlas, 1953). Fluoroscopy of the stomach with barium meal reveals a single or sometimes multiple central filling defect, usually freely movable on manipulation (Chont, 1942). When the bezoars are large, the meal may be seen to form as a cap copering something in the stomach, and canalize along the greater or lesser curvature, between the mass and the stomach walls (Hart, 1923).Gastroscopy has also been put forward as a diagnostic procedure (Browne, 1940; McKechnie, 1972; and Buchholz et al., 1972).

Gastrotomy had been considered to be the treatment of choice (Bockus, 1963). However, other methods have been tried to remove phytobezoars. Dann et al. (1959) succesfully treated a patient suffering from persimmon type bezoar without operation, by giving papain- sodium bicarbonate (0.5 gm.) in a glass of water every 3 hours. Acetylcysteine (Shlang, 1970), and Adolph's Meat Tenderizer (Buchholz, 1972) have been given to patients with undetermined phytobezoar. Gastroscopic biopsy has also been performed to tear bezoar apart piece to piece (McKechnie, 1972).

Our case presented had clinical signs of gastroenteritis and an intra-abdominal tumor. Based on history, roentgenographic findings, surgical report, pathological and biochemical analyses, the diagnosis of banana phytobezoar was established. It might be the youngest case of phytobezoar ever reported in the literature.

It is the purpose of this paper to draw attention especially to Indonesian pediatricians, to the possibility of phytobezoar due to banana, since in large areas of Indonesia there is still a habit of giving banana to newborn babies.

Summary

A case of a 2-month-old Indonesian baby suffering from phytobezoar of the banana type has been reported. The bezoar was removed by way of a gastrotomy. The literature on phytobezoar has been briefly reviewed.

Acknowledgement

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