

ORIGINAL ARTICLE

Complication of Early Banana Feeding in Neonates

by

E.M. HALIMUN, JOKO SUNYOTO, S.K. HUTOMO
OEN L.H* and V. YUWONO**

(From the Department of Surgery Medical School University of
Indonesia / Children & Maternity, Biochemistry* and Pathology**
"Harapan Kita", Jakarta)

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Abstract

Early introduction of banana in newborn babies is still practiced by many mothers from different areas throughout the country and gastric perforation due to phytobezoars are still a problem in the country.

During the years 1984 through 1991 at the Children and Maternity Hospital Harapan Kita Jakarta, fifteen neonates were treated for gastric perforation among which 6 were due to banana bezoar, 6 were due to defect of the gastric muscle, 2 were due to necrotizing enterocolitis (NEC) and 1 was due to iatrogenic duodenal obstruction.

Pathogenesis of gastric perforation due to phytobezoar and the macroscopic and histopathological appearance of the perforation and its differences with perforations due to other causes were discussed.

Introduction

The prevalence of disorders in any environment often reflects the interplay of climate, customs, ignorancy and nutritional factors of that community. After delivery, the production of colostrum or breast milk is delayed or inadequate. In some rural areas of Indonesia, the mother substitutes breast milk with plain water, sucrose sweetened water, rice water or even bananas.

Early banana feeding in newborn babies is practiced by many mothers from different areas in the country, since this fruit is easy to get and the banana tree

grows in almost every house yard in the country side. They noticed that the female bird always feed their young with bananas. The advantages of banana as a constituent in normal infant meals has been described in many reports since 1931. However, the finding of banana remnants as a cause of gastric perforation in neonates is unknown in the Western literature. In this communication, we would like to present 6 (six) cases of gastric perforation due to banana feeding out of a total of 15 cases of gastric perforation.

Materials and Methods

Data were obtained from records compiled by the authors from neonates who underwent surgical treatment for gastric perforation at the Children & Maternity Hospital Harapan Kita Jakarta between 1984 and 1991. The surgical finding, the

location of the perforation, foreign mass found in the peritoneal cavity such as fibrin, milk or banana mass, the macroscopic and microscopic appearance of the gastric wall were recorded to determine the cause of the perforation.

Results

During the 8 years period, 15 neonates were treated surgically for gastric perforation. The various causes of perforation are shown in Table I.

Among the 15 neonates presented in our hospital with gastric perforation, 6 cases or 40 % were due to defect of the gastric muscle proven by macroscopic appearance and histologic findings. In one of the six neonates with muscle defect, a female child of 4 days old, we also found a banana mass inside the perforated stomach and a history of banana feeding at day two. However this case is not

included in the following 6 cases for investigation of gastric perforation due to banana bezoar. Two cases out of 15 were due to necrotizing enterocolitis (NEC) and one case was iatrogenic in a case of duodenal atresia with nasogastric tube.

Table II describes the clinical data of the 6 neonates presented at our hospital with perforation of the gastric wall and the finding of banana constituent as the sole suspected cause of perforation. Only one case (case no. 3) died, occurring 3 days post operatively due to septicemia.

Table I. Fifteen cases of gastric perforation in neonates treated at Children & Maternity Hospital Harapan Kita (1984-1991)

Pathology	Number	Age range (days)
Muscle defect	6	3 - 5
NEC	2	8 and 11
Iatrogenic in duodenal atresia	1	6
Banana	6	3 - 27

The macroscopic appearance of the perforation found during surgery are described in Figure I. Perforations due to banana bezoars were found at different sites, but mostly in the greater curvature.

Gastric perforation due to muscle defect (Fig.II) was found only at two loca-

tions either at the greater or the lesser curvature with predominance at the greater side. The width of perforation in bezoar cases are between 4 - 7 mm in diameters, while in those caused by muscle defect it was more than 20 mm in length.

Table II. Clinical data of 6 neonates with banana bezoar in Children & Maternity Hospital Harapan Kita

Case no.	Sex	BW	Age/days	Birth attendant by	Sign
1	M	3.200	6	Traditional birth attendant	Constipation
2	M	2.600	3	Midwife	Constipation
3	F	3.800	4	Midwife	Constipation
4	M	2.500	27	Midwife	Diarrhea
5	M	2.700	6	Doctor	Hyperbilirubinemia
6	M	3.000	15	Doctor	Constipation

Case no.3 died 3 days post op: septicemia

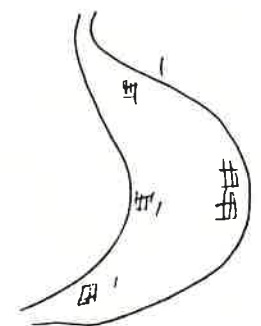


Figure 1. Sites of gastric perforation due to banana bezoar in 6 neonates

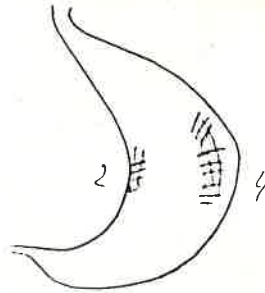


Figure 2. Sites of gastric perforation due to muscle defect in 6 neonates

Excision of the perforated margin was done in every case before closing the defect. The histologic findings of the specimens were described in Table III.

Table III. Histologic appearance of 6 neonates with gastric perforation due to banana bezoar

Ischemic	: - edematous stroma - congestive vessels - bleeding
↓	
Necrosis	: covered by fibrin
↓	
Perforation	: necrosis of all layers

Discussion

The value of banana in the diet has been known for sometime and ancient Chinese writings ascribed marvelous healings and medicinal effects; not only to the fruit, but also to the roots, leaves and flowers of the plant [5]. Banana in diet is primarily a source of carbohydrates. The ripe fruit contains a lot of sugar, cellulose and a small amount of starch. From the time that Haas (1924) demonstrated the value of banana in the treatment of celiac disease, the fruit has been accepted as a constituent of the diet in normal infants [1]. The feeding of bananas as the first

solid food of all infants entering the New York Foundling Hospital as a routine practice was started in 1931 [2]. In the newborn the main enzyme for carbohydrate is amylase which is present in the saliva. A greater amount of amylase comes from the pancreatic juice, but is available insufficient amount until the age of 4 months.

Undigested food concretions are called bezoars, and banana remnants are known as phytobezoars. Banana bezoars in the stomach will cause any harm if accompanied by conditions such as :

bulk of undigestible material; stasis due to gastric outlet obstruction; disturbance in gastric motility. This three conditions combined with the accumulation of gastric acids will tear the surface of the mucous membrane and thus may produce a wound in the gastric wall. Laboratory analysis of a phytobezoar obtained from a surgical case revealed coarse cellulose fibers as the nucleus of the water insoluble mass. Insoluble and quantitation of the fiber content of two types of banana, usually fed to newborns, respectively the Ambon and the Raja Siam variety, revealed about twice the amount of coarse cellulose fibers in the first mentioned variety. The phytobezoars were found in neonates fed this variety of banana. The Ambon variety contains predominantly fine fibers. The cellulose fibers were digested by the enzyme cellulose.

The purpose of our investigation men-

tioned above is that in the future, treatment of early cases of phytobezoar in neonates before perforation occurs is first medical management before to surgical intervention.

In every neonatal emergency case with distended abdomen and a history of ingestion of bananas, one should be aware of phytobezoars. Examination including X-Ray and sonography is needed to detect the presence of gastrointestinal obstruction and foreign mass. If the mass is still inside the stomach, gastroscopy is the next step. The obstructive material can be removed by endoscopy, attempts should be made to dissolve the mass namely by the administration of enzymes. The medical dissolution of phytobezoars in adults using enzymes have been described in many reports. A certain enzyme has been given to specific plant fibres such as cellulase or proteolytic enzymes [3,4,5,6].

Conclusion

There are big differences in cases of phytobezoar in the stomach between reports in many literatures with this present communication. Previous reports concerned gastric outlets obstruction due to foreign mass, while our cases present-

ed with gastric perforation as an emergency situation. The education to the mothers about the proper time to give banana to their babies (not younger than 4 months old) is important to prevent this condition.

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