ISSN 2321 – 7359 EISSN 2321 – 7367

discovery

Medical Science

The International Weekly Journal for Medicine

Diospyrobezoars as a cause of intestinal obstruction in children - a case report

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Publication History

Received: 24 February 2014
Accepted: 9 April 2014
Published: 16 April 2014

Citation

Satish Kumar, Pramod Kumar Sharma, Suresh Gupta, Gupta AK. Diospyrobezoars as a cause of intestinal obstruction in children - a case report. *Medical Science*, 2014, 7(25), 60-62

ABSTRACT

Diospyrobezoars are the phytobezoars formed after ingestion of unripe persimmon fruits. They have been reported only once from our country in past. We report two such cases that came to us with intestinal obstruction and were successfully treated with enterotomies. The importance of understanding this entity lies in the fact that it may be preventable by patient education.

Key words: Diospyros, Persimmon, Phytobezoar, Pediatric Surgery

1. INTRODUCTION

Diospyrobezoars are the most common phytobezoars reported in the literature (Choi et. al., 1988). The fact that these bezoars are related to the ingestion of persimmon fruits (generic name Diospyros) gives them the name "diospyrobezoar", which is derived from the Greek words *Dios* and *Pyros*, means "Wheat of Zeus," (Carroll, 1959). The first case of diospyrobezoar was described in 1894. (Outten, 1894). Since then these bezoars have been reported from

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Figure 1

Operative photograph from case 2 showing a diospyrobezoar in the ileum

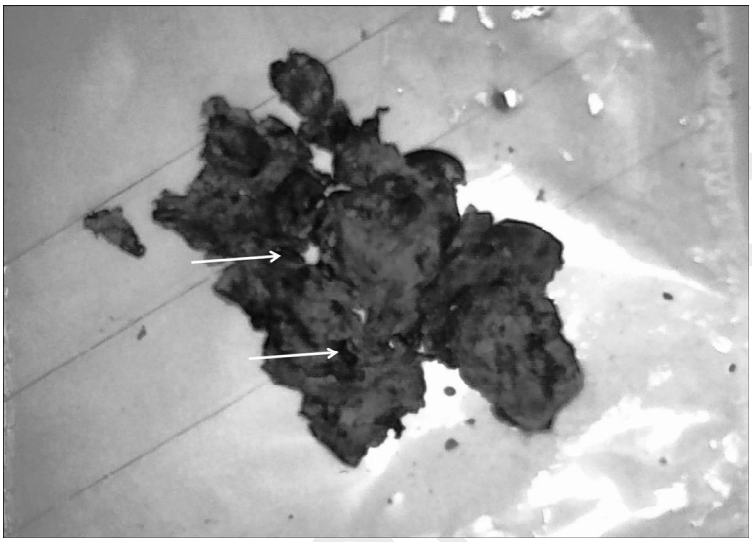

Figure 2

Diospyrobezoar from the caes 2. Dark coloured persimmon seeds (arrows) can be seen interspersed in a light coloured amorphous material

many parts of the world, mostly in adult patients (Choi et. al., 1988; Zafar et. al., 2003; Fu et. al., 2009; Krausz et. al., 1986). However even after widespread production and consumption of Persimmon fruits in India (Troup, 1921) till date only one confirmed case of diospyrobezoars in pediatric population has been reported from our country (Saha et al., 2001). We report two such cases and review the literature.

2. CASES

1. Case 1- A ten year old male child presented in the month of September 2011 with complaints of pain in abdomen and abdominal distension for three days. On examination the abdomen was tense and distended. An erect x-ray of abdomen was asked for and it showed multiple air fluid levels. A clinical diagnosis of acute intestinal obstruction was made and exploratory laparotomy was performed. A mass of about 4 c.m. diameters was found about 40 c.m. proximal to ileocaecal junction. The mass was hard and it was not possible to crush it in vivo and propel to colon, so an enterotomy was performed and the mass was removed. On cut section the mass was composed of persimmon seeds and vegetable fibers interspersed in a glutinous material. Post operative course was uneventful and the child was discharged on 8th post operative day.

2. Case 2- A four year old girl presented to casualty in the month of December 20011 with complaints of pain abdomen, abdomen distention and bilious vomiting for last four days. Unlike previous patient there was a history of recurrent pain in abdomen for last two three weeks. The patient was taken for exploratory laparotomy with a provisional diagnosis of acute intestinal obstruction. There was a mass of 3x3x4cms size present in the terminal ileum about 20cm proximal to the ileoceacal junction, again an enterotomy was performed and the mass removed (Figure 1 and 2). On cutting the mass was similar to the previous patient. The patient was discharged on the 9th post operative day.

In both the cases differential counts and serum Na^+/ K^+ values were unremarkable. The masses from both the patients contained seeds of persimmon fruits along with other vegetable material. In retrospect the parents of both the patients gave history of persimmon fruit ingestion; however there was no definite history of ingestion of unripe fruits. Neither of the patients had any history of previous surgery.

3. DISCUSSION

Persimmons are the members of Diospyros genus of plants, which in turn is a part the family Ebenaceae. They are widely grown in India including the state of Himachal Pradesh, Uttarakhand, Jammu and Kashmir (*Diospyros kaki*), Madhya Pradesh, Odisha, West Bengal, Andhra Pradesh, Maharashtra (*Diospyros melanoxylon*) and few other states (Troup, 1921). *Diospyros melanoxylon* is commonly known as '*Tendu*' or '*Kendu*' and is famous for its leaves used in *Bidi* manufacturing.

The mechanism of formation of diospyrobezoars is unique in nature. It's not the result vegetable fibers mechanically entangling together, but essentially a chemical phenomenon. Persimmons are of two main varieties, astringent and non-astringent. The unripe fruits of astringent varieties are rich in soluble tannin called '*Shibuol*' which forms a coagulum when comes into contact with hydrochloric acid in the stomach, followed by secondary trapping of fibers and seeds in the coagulum (Izumi et al., 1933). This means even the intestinal diospyrobezoars actually originate in the stomach.

Satish kumar et al.
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Saha et al. in 2001 reported two cases of phytobezoars which they attributed to the persimmons. Both of their patients gave history of persimmon ingestion in retrospect. However unlike our patients, the masses in these patients had cores of seeds. Based on this observation the authors proposed that the seeds of persimmon act as core around which the bezoars are formed, a mechanism which is not true for diospyrobezoars. To the best of our knowledge this is the only report of diospyrobezoars from India till date.

Patients of intestinal diospyrobezoars commonly present with signs of intestinal obstruction (Krausz et al., 1986) as happened in both of our patients. There may be a history suggestive of recurrent sub acute obstructions in past, like case 2 in this report. While a history of previous gastric surgery is very common in adult patients (Moriel et al., 1983), it is unlikely in children. More importantly a history of persimmon fruits ingestion is usually available but rarely of unripe fruits (Ripollés et al., 2001).

Both ultrasound and CT scan have been advocated as a part of radiological workup. While the CT scan is highly accurate in diagnosing the total number of bezoars in any patients, the ultrasound can miss most (Verstandig et al., 1989). Both the studies are also likely to misdiagnose the location of mass in gastro-intestinal tract. As far as acute intestinal obstruction is concerned, in our opinion these studies serve an academic purpose only.

Treatment depends on presentation and the location of the mass. If the patient has presented in intestinal obstruction, then surgery is usually the only option but conservative management with intravenous fluids and water soluble contrast meal has also been reported (Izumi et al. 1933). The mass is usually located in the distal ileum (Ripollés et al., 2001) (both of our cases), however other locations including jejunum (Verstandig et al., 1989), and colon have also been reported. It is mandatory to examine whole of the gastro-intestinal tract as multiple bezoars are not rare (Fu et al., 2009). The gastric bezoars can be retrieved endoscopically or through surgery. Some success has been reported with use of N-acetyl cystine or carbonated drinks (Azevedo et al., 2011).

To conclude, we suspect that the problem is much more common in our country than reported and educating patients about unripe persimmon fruits could help reduce it.

DISCLAIMER/ ACKNOWLEDGMENT

None

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