Case Report

Decorative crystal balls causing intestinal perforation

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ABSTRACT

Crystal jelly balls are used for decorative purpose in homes and offices. They swell on contact with water. We managed a patient with a clinical diagnosis of acute abdomen. At surgery, there was fecal peritonitis and three ileal perforations caused by previously ingested decorative crystal balls.

KEY WORDS: Acute abdomen, crystal balls, generalized peritonitis, intestinal perforation, missing foreign body

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INTRODUCTION

Foreign body (FB) ingestion is a common presentation in the emergency room.[1] Problems arise where history regarding FB ingestion is lacking. A lot of gastrointestinal tract (GIT) foreign bodies have been recognized and some of them presented with intestinal perforation and peritonitis.[2,3] Herein, we are reporting, for the first time in the literature, a complication of crystal ball ingestion.

CASE REPORT

An 18-month-old male baby presented with complaints of fever, pain abdomen, bilious vomiting, and abdominal distension for 2 days. There was no history of trauma, longstanding fever or preceding infection. He was febrile, respiratory rate 30/min; pulse 100/min, and blood pressure within normal limits. The abdominal examination revealed a distended abdomen with tenderness and guarding in all quadrants. The bowel sounds were absent. After resuscitative measures, the laboratory investigations revealed hemoglobin of 12 g/dl and a TLC of 14,000. An erect abdominal radiograph revealed air under diaphragm and ultrasound abdomen showed debrinous fluid in the pelvis and in between the intestinal loops.

With a diagnosis of generalized peritonitis, at surgery, there were three large perforations, about 1 × 1 cm in dimension and 5-7 cm apart on the antimesenteric and lateral walls of the mid ileum. Some rubbery rounded objects were present in the intestine at the level of each perforation. We retrieved three such balls from the affected intestine that caused intestinal perforation [Figure 1]. The rubber balls were removed from the intestine and the affected portion of intestine resected. An end-to-end ileo ileal anastomosis was performed. The postoperative recovery was uneventful.

On reinquiring the parents about the nature of FB found during operation, the mother told that she bought decorative crystal balls a few days back for decoration and the child ate a few of them. As immediately nothing happened to him, they ignored it. The symptoms

Figure 1: Decorative crystal ball retrieved from the intestine

appeared 2 days after ingestion thus they were not correlating the ingestion of crystal balls with the clinical condition of their son.

DISCUSSION

Crystal balls are also known as jelly balls, water beads, jelly beads, and water jelly balls. They are composed of super absorbent polymer (SAP) which has properties of water absorbance and thus swell in size. Their size ranged between 1 and 4 mm. They are capable of absorbing water 500 times of their weight and can swell up to 30-60 times of their original volume. Their water absorbency depends upon the ionic concentration of the solution, and degree of cross-linked polymers. In distilled water they absorb maximum whereas in presence of ions their absorbance capability reduced to a significant level. Similarly low-density cross-linked SAP can absorb maximum water and convert to gels; the examples are hydrogels/hydrocolloids used in wound dressings where they can absorb wound secretions. The other examples of its use are pampers and sanitary pads, etc. High-density cross-linked SAP such as crystal balls have low absorbency but can retain their shapes. This SAP (crystal balls) can increase in size up to 2 cm or more depending upon the nature of the polymer used in their synthesis.[4]

Intestinal perforation is a rare complication of GIT foreign bodies. The mechanism of intestinal perforations is direct penetration by sharps, pressure necrosis, and perforation in the case of bezoars (trichobazoars), chemical necrosis, and secondary to the volvulus produced by the FBs. Bakhshaeekia *et al*. described a case of intestinal perforation as a result of crumpled paper.[5-8]

There could be two possibilities regarding the mechanism of perforation in our case. One possibility is that the crystal balls induced the chemical injury in the intestinal wall that resulted in intestinal perforation. The other possibility is that the crystal balls, which were initially very small in size, easily passed the esophagus, pylorus, and duodeno-jejunal junction. When they reached in the mid-ileum, their size gradually increased by absorbing water from intestinal juices. This resulted in pressure necrosis of the intestinal wall and hence, the necrosis and perforation followed. The second theory is the most plausible explanation of the intestinal perforations encountered in our patient, as these polymers are considered inert to the biological matter (that is why used in wound dressings). To the best of our knowledge this kind of FB is not reported before.

Community awareness is necessary to avoid such material in homes where there is a risk of accidental ingestion by children or mentally retarded persons.

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