

## **Unexpected Finding Following Magnetic Foreign Body Ingestion: A Case Report of Small Bowel Perforation in a Pre-Schooler Child**

**Adel Ahmed Alfayez<sup>1\*</sup>, Misheal Mohammad Madni<sup>2</sup> and Ahmed Soud Alsaïd<sup>3</sup>**

<sup>1</sup>*Pediatric Surgery Department, PSMMC, Riyadh, Saudi Arabia*

<sup>2</sup>*Pediatric Surgery Department, King Khalid Hospital, Hail, Saudi Arabia*

<sup>3</sup>*General Surgery Department, King Khalid Hospital, Hail, Saudi Arabia*

**\*Corresponding Author:** Adel Ahmed Alfayez, Pediatric Surgery Department-Prince Sultan Military Medical City, Riyadh 11546-Saudi Arabia.

**Received:** August 08, 2019; **Published:** August 20, 2019

### **Abstract**

Ingestion of foreign bodies (FBs) like coins, pins, needles, and batteries is common practice in children. On the other hand, ingestion of multiple magnets is very rare and carries a risk of intestinal obstruction vs perforation. The main explanation for bowel perforation is that multiple magnets are attracting each other and in between bowel loops which will cause pressure necrosis of the lumen and further perforation. We report a toddler patient who came to the emergency department with a history of foreign bodies ingestion. Found to have a tender abdomen after 2 days during observation in our hospital, with 3 radiopaque objects was identified and multiple air fluids levels seen in abdominal X-ray. The patient had a pneumoperitoneum shown in abdominal CT. Abdominal exploration revealed 6 perforated small bowel segments with 3 magnets objects seen just before the ileocecal valve, magnets were removed, 2 perforations were primarily repaired with another perforated bowel resected and anastomosed.

**Keywords:** *Magnetic Foreign Body; Small Bowel Perforation; Foreign Body Ingestion; Pediatric Age Group*

### **Introduction**

Over the past 10 years, pediatric magnets FBs ingestions have been increasing and have received increasing attention. Most of the time, FBs are passing smoothly through the gastrointestinal tract with no intervention. Ingestion of multiple magnets has devastating risks and cause mural pressure necrosis. These risks would result in volvulus, obstruction, fistula formation, bowel perforation, intraabdominal sepsis, and death [1,2]. The number of ingested magnetic particles commonly range from 3 - 5, reached up to 17 and some reported more than 60 pieces [3,4]. We used the CARE checklist when writing our report [5].

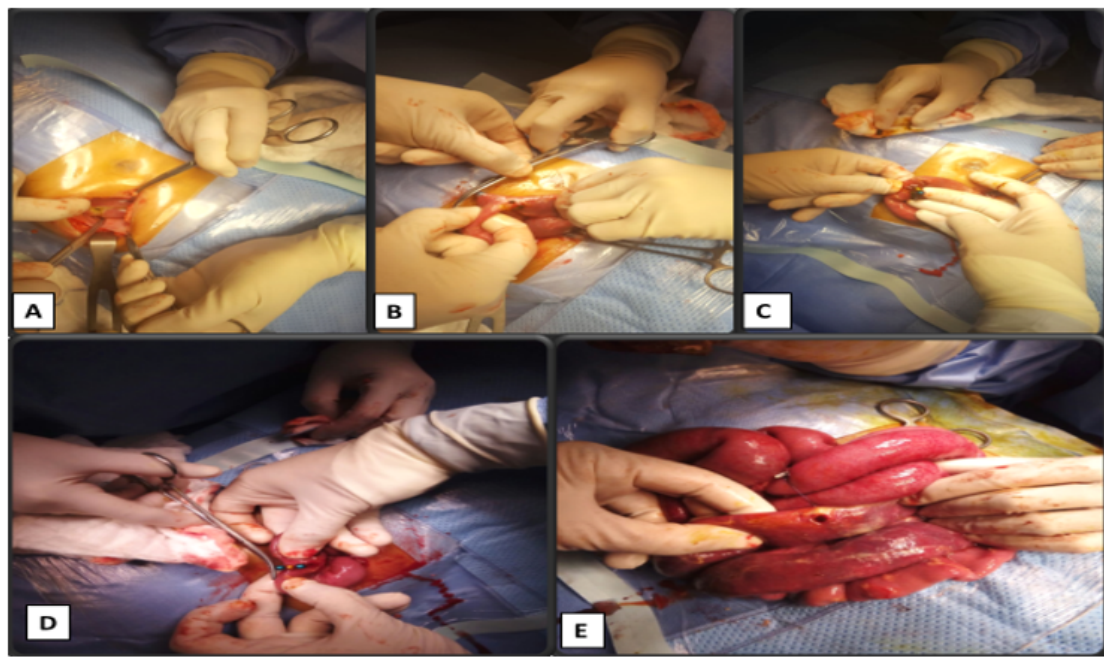
### **Case Report**

A preschooler old patient came to our emergency department with the parents complained of mild abdominal pain with radiographic film obtained from outside the hospital which showed radiopaque FBs at right iliac fossa. Initially, patient has food content vomiting with poor feeding for 2 days back. No other associated symptoms significantly mentioned in history.

Upon examination, the Patient looks slightly pale and lethargic with mild dehydration. Vitals revealed a tachycardia, with no fever and saturated well on room air. Abdomen looks nice, was soft lax, not tender upon palpation and no masses were felt.

So, adequate resuscitation was started. The patient was admitted for observation, US abdomen showed minimal free fluids. 2 days after, patient started to have bilious vomiting, abdominal distention with tenderness, rigidity and hypoactive bowel sounds. Initial Abdominal X-ray showed multiple air fluids levels with 3 radiopaque objects observed at right lower quadrant area, same location in comparison with the previous film. While patient is stable, CT abdomen done urgently which showed multiple dilated bowel loops and pneumoperitoneum.

The patient was taken for urgent laparotomy exploration which revealed 3 magnets objects attached together and causing 6 perforations with obstruction, before the ileocecal valve and proximally (Figure 1). There are multiple perforations proximally, involved bowel was resected and anastomosed. Two of the perforations were primarily repaired. Patient stayed in the hospital 8 days, remained stable with gradually tolerating oral intake and discharge after on stable condition. Upon follow up patient has no symptoms and didn't require any further investigations vs intervention.



**Figure 1:** Intraoperative findings: Initially single perforation is identified (A-B). Three FBs clearly noticed and removed (C-D). One of the perforated segments, resection, and anastomosis done at the site of multiple perforations proximally (E).

## Discussion

Children aged 6 months and 6 years are commonly involved in FBs ingestion [6]. In 2015, 94,820 cases were reported in the united states and 68,371 of them occurred in pediatrics with aged less than or equal 5 years [7]. On the other hand, numbers are variable and had no exact figures with more than 125,000 FBs ingestion registered in the poison control centers at America 2007 and aged younger than 19 years [8]. Moreover, young children usually using their mouth commonly and they can't figure out edible vs nonedible objects along with lacking their physiological teeth and they are poorly coordinating their swallowing [9]. A great variety of ingested FBs are reported from different cultural and geographical backgrounds.

In regard to clinical presentation, most children are asymptomatic initially. After that, symptoms such as irritability, poor feeding, nausea, vomiting, and abdominal pain either continuous or intermittent started to appear, while in some cases complaining of on/off vague abdominal pain will last as long as six months. Small intestine represents the longest part in the gastrointestinal tract that has mostly natural curves, a high number of complication will be there (51.3%), followed by intestinal colonic (16.6%), and gastrojejunal fistulas (13.9%) [10].

Attractive colors, easy availability, and small size are the possible factors that contribute to the increased number of cases. Additionally, doing a good number of national warnings campaign is lacking and the risk information which is written in the boxes is not clearly obvious for the parents. Once a child swallows these multiple magnets objects, it moves further through the bowel loops, then it will attract each other at a specific point within the adjacent bowels and causing intestinal luminal compression. Finally, these will lead to pressure necrosis with resultant volvulus, perforations and fistula formation which carries significant morbidity and rarely mortality [11]. Morbidity usually due to delay on either presentation or making the diagnosis.

Diagnosis usually made clinically upon taking the history with the help of different imaging modalities. Initially started by X-Ray then CT scan if questionable or not conclusive radiographical findings. Using the endoscopy in the upper gastrointestinal tract is diagnostic and therapeutic especially if the FBs remained in the esophagus. Fortunately, usually, these FBs will pass spontaneously with uneventful consequences once it reaching the stomach, 10 - 20% of cases warrant intervention by endoscopy and around 1% would necessitate operative intervention as a result of the complications [12].

### Conclusion and Learning Points

- These attractive toys with its contents especially magnetic objects carry fatal hazards upon ingestion.
- Closely monitored and surgical approach for multiple magnets ingestion could be the best option in order to avoid its complications.
- A prevention strategy for magnetic FBs ingestion is strongly needed as the number is increasing and parents should be aware of this.

### Questions need to be answered:

- 1- Should we go directly for surgery with no role of observation in case of multiple magnets FBs ingestion, to avoid its significant complications?
- 2- Is there a chance that the manufacturing companies will decrease the intensity of the magnetic field in toys so to decrease its strength and further associated pressure necrosis?
- 3- What is the cut off duration between the time of ingestion and the time of presentation in which we should intervene in such cases regardless of FBs location at the gastrointestinal tract?

### Source of Support/Funding

None.

### Competing Interests

None declared.

### Acknowledgment

None.

### Patient Consent

Unfortunately, verbal consent was taken only. We tried to call parents for signing the consent but their number is not reachable with no signal at all “it could be wrongly registered in the records”.

### Ethical Approval

The institution does give ethical approval for research only but not case reports as it’s the responsibility of the consultant in charge either to publish or not.

### Bibliography

1. Nui A., *et al.* “An intestinal volvulus caused by multiple magnet ingestion: an unexpected risk in children”. *Journal of Pediatric Surgery* 40 (2005): 9-11.
2. Najj H., *et al.* “Bowel injuries caused by ingestion of multiple magnets in children: a growing hazard”. *Pediatric Surgery International* 28.4 (2012): 367-374.
3. Strickland M., *et al.* “Magnetic Foreign Body Injuries: A Large Pediatric Hospital Experience”. *Journal of Pediatrics* 165 (2014): 332-335.
4. Shalaby MS. “How dangerous a toy can be? The magnetic effect”. *Archives of Disease in Childhood* 100.11 (2015): 1049-1050.
5. Gagnier JJ., *et al.* “The CARE Guidelines: Consensus-based Clinical Case Reporting Guideline Development”. *Global Advances in Health and Medicine* 2.5 (2013): 38-43.
6. Ambe P., *et al.* “Swallowed foreign bodies in adults”. *Deutsches Ärzteblatt International* 109.50 (2012): 869-875.
7. Mowry JB., *et al.* “2015 annual report of the American Association of Poison Control Centers’ National Poison Data System (NPDS): 33<sup>rd</sup> annual report”. *Clinical Toxicology* 54.10 (2016): 924-1109.
8. Soomro S and Mughal SA. “Singing Magnets Ingestion: A Rare Cause of Intestinal Obstruction in Children”. *Journal of the College of Physicians and Surgeons Pakistan* 24.9 (2014): 688-689.
9. Kay M and Wyllie R. “Pediatric foreign bodies and their management”. *Current Gastroenterology Reports* 7.3 (2005): 212-218.
10. Si X., *et al.* “Multiple Magnetic Foreign Bodies Causing Severe Digestive Tract Injuries in a Child”. *Case Reports in Gastroenterology* 10 (2016): 720-727.
11. Dutta S and Barzin A. “Multiple magnet ingestion as a source of severe gastrointestinal complications requiring surgical intervention”. *Archives of Pediatrics and Adolescent Medicine* 162.2 (2008): 123-125.
12. Brown DJ. “Small bowel perforation caused by multiple magnet ingestion”. *Journal of Emergency Medicine* 39.4 (2010): 497-498.

**Volume 6 Issue 9 September 2019**

©All rights reserved by Adel Ahmed Alfayez., *et al.*