Annals of



Pediatrics and Child Care

Case Report

Zefov V, et al. Ann Pediatr Child Care: APCC-100009.

Sonographic Diagnosis of Perforated Meckel's Diverticulum Due to Ingestion of Button Battery

Zefov V¹, Abdelrady FAZ^{1*}, Jaber G² and Ghazalah MA²

¹Department of Pediatric Radiology, Latifa Women and Children Hospital, UAE

²Department of Pediatric Surgery, Latifa Women & Children Hospital, UAE

*Corresponding author: Abdelrady FAZ, Department of Pediatric Radiology, Latifa Women and Children Hospital, UAE, Tel: +97142193000; Email: abdelrady81@gmail.com

Citation: Zefov V, Abdelrady FAZ, Jaber G and Ghazalah MA (2019) Sonographic Diagnosis of Perforated Meckel's Diverticulum Due to Ingestion of Button Battery. Ann Pediatr Child Care: APCC-100009.

Received date: 11 October, 2019; Accepted date: 15 October, 2019; Published date: 21 October, 2019

Abstract

Foreign body ingestion is common in pediatric age group. Usually it passes with no consequences, but in some cases it might be retained in the lumen of esophagus, stomach, intestinal loop, appendix or Meckel s" diverticulum. Particularly dangerous is the swallowing of button battery, leading to severe complications. Accurate diagnosis of lodged foreign body is crucial for early management, and prevention of further complications. The diagnostic arsenal includes conventional radiographs of chest and abdomen, CT and Endoscopy. In our case, we emphasize the role of US as a safe, simple, quick as well as an accurate method for diagnosis and identification of Button battery in Meckel's diverticulum

Keywords: Button battery; Foreign body ingestion; Meckel's diverticulum

Introduction

Meckel's diverticulum (MD) is identified in 1.2-3% of the population. It results from the failed involution of the Omphalomesenteric duct, which usually obliterates between 5th and 7th week of fetal life. Most of people with Meckel's diverticulum remain asymptomatic. Around 5-10 % develop symptoms that prompt medical attention [1]. In pediatric age the most often symptoms are bleeding per rectum, intussusception, pain in lower abdomen. Very often, it mimics appendicitis. Foreign bodies (FB) ingestions are common in pediatric age group with wide varieties of size, shape and material of the FB. Most of children are toddler and the most vulnerable children are those with developmental delay. Approximately 3% of all FB ingestions are small button battery (BB). Probably the number of ingestions in children is bigger, as the production of sophisticated automated toys with BB increases drastically in the last decades. The Gastrointestinal tract is the most common place for FB retention but the MD appears the most uncommon place for (BB) lodgment. There are few previous reports of BB lodged in a MD but without characteristic

sonographic diagnostic signs. We present a case with BB lodged in MD, complicated with perforation and sent to our institution with diagnosis acute appendicitis.

Case report

We present a case of 3 years old boy with lower abdominal pain, swallowing BB, sent to our institution to R/O Acute appendicitis. The conventional Radiographs of chest and abdomen supine position from previous hospital show two BB located in lower abdomen (Figure 1A), the bigger sized battery appears at level of ileocaecal valve, surrounded with soft tissue mass suggestive of attempting ileocolic intussusception or per appendicular mass. The erect position (Figure 1B) shows air fluid levels suggestive of incomplete bowel obstruction. The lateral view (Figure 1C) shows anterior location of the bigger BB raising the possibility of lodgment in MD and the patient was sent for abdominal sonography for precise localization of BB whether it is in the terminal ileum, appendix or MD. The abdominal sonography revealed normal size and echotexture of the appendix (diameter was 5 mm) with no BB in the lumen (Figure 2A). The further scanning discovers a tubular structure with typical pseudogestation sac sign, surrounded with redundant echoic omentum suggestive

Citation: Zefov V, Abdelrady FAZ, Jaber G and Ghazalah MA (2019) Sonographic Diagnosis of Perforated Meckel's Diverticulum Due to Ingestion of Button Battery. Ann Pediatr Child Care: APCC-100009.

of inflamed MD probably perforated (Figure 2B) with mild tilting of the transducer, the arching hyperechoic outlines of BB was visualized. The final diagnosis was BB lodged in MD and the patient was sent directly for surgical removal without any further investigations. The surgical specimen shows corroded BB out of the tip of perforated MD (Figure 2C).



Figure 1A: Abdominal radiograph, supine position. The larger BB is located at level Ileocecal valve, surrounded with soft tissue density toward the caecum mimicking attempting ileocaecal intussusception or large periappendicular mass.



Figure 1B: The erect position of abdomen shows air fluid levels suggestive of incomplete small bowel obstruction.



Figure 1C: Lateral view of abdomen. The larger BB appears anteriorly located which prompted sonographic exam for exact location.



Figure 2A: abdominal ultrasound, the appendix appears with diameter 5 mm and normal outlines. The suspected variant of acute appendicitis with periappendicular mass is negative.



Figure 2B: Medial to the normal appendix, a tubular structure with Pseudogestation sac sign is seen (arrows) surrounded with hyperechoic omentum suggestive of inflamed Meckel's diverticulum.



Figure 2C: With mild tilting of transducer, hyperechoic arch of the BB metallic outline appears with acoustic shadowing.

Citation: Zefov V, Abdelrady FAZ, Jaber G and Ghazalah MA (2019) Sonographic Diagnosis of Perforated Meckel's Diverticulum Due to Ingestion of Button Battery. Ann Pediatr Child Care: APCC-100009.



Figure 3: Resected Meckel's diverticulum with gangrenous tip and corroded BB.

Discussion

BB represent a distinct injury risk when ingested. Sodium hydroxide and hydrochloric acid appear at the cathode (negative) and anode (positive) ends respectively, leading to pH changes around the terminals. Such production leads to liquefaction necrosis and tissue injury [1] the age is an important predictor of severity. All fatalities and 85% of major effects are in children who are younger than 4 years. A major effect or death occurred in 12.6% of children who were younger than 6years and ingested 20to 25-mm batteries [2]. The lithium alkaline battery produce more severe tissue damage compared with the BB because the lithium battery has higher voltage of 3V. The experiments with dogs show necrosis of esophageal epithelium 15 min. after fixation of battery deep to the inner muscular layer [3]. It is obvious how important is the timing management of MD with lodged BB. Time-consuming exams are not necessary. Our decade experience with sonographic diagnosis of MD using the sonographic pseudogestation sac sign shows -sensitivity 87.1%, specificity82.1percentage, positive and negative predictive values for MD are 84.4 % and 85.2% respectively [4]. Our presented case proves once again the validity

of sonographic pseudogestation sac sign for precise diagnosis of MD. Patients who ingest button batteries should have an initial roentgenogram to determine the location of the foreign body. If the battery is located in the esophagus, urgent extraction is advisable. If it is located in the stomach, extraction within 24 hrs is necessary. If the battery has passed distal to the stomach, the patient needs follow up with serial roentgenograms. When the battery location does not change and peritoneal irritation appear, an operation is the next step [5].

Conclusion

Timing management of MD with lodged BB (extremely rare) is essential for the outcome. Despite rarity, such combination is real and always should be considered in differential diagnosis. The sonographic pseudo gestation sac sign is reliable diagnostic tool for precise diagnosis of MD. It complies with international efforts for "Image Gently".

References

- Farber BA, Shaul E, La Quaglia MJ, Janofsky E, Statter MB, et al. (2018) Button battery lodged in Meckel's diverticulum. Journal of Pediatric Surgery Case Report 33: 52-54.
- Litovitz T1, Whitaker N, Clark L, White NC, Marsolek M (2010) Emerging battery-ingestion hazard: clinical implications. Pediatrics 125: 1168-1177.
- Tanaka J1, Yamashita M, Yamashita M, Kajigaya H (1998) Esophageal electrochemical burns due to button type lithium batteries in dogs. Vet Hum Toxicol 40: 193-196.
- Zefov VN, El-Maadawy SM, Abdelrahman NA, Abdul Rahman D, Mustafawi AR (2017) Value of sonographic pseudogestation sac sign in diagnosing Meckel diverticulum in children presenting with bleeding per rectum: a decade's experience European Congress of Radiology, Pediatric session (B-0515). The best scientific paper presentation award.
- Karaman A, Karaman I, Erdogan D, Cavusoglu YH, Aslan MK, et al. (2007) Perforation of Meckel's diverticulum by a Button Battery: report of a case Surg. Today 37: 1115-1116.

Citation: Zefov V, Abdelrady FAZ, Jaber G and Ghazalah MA (2019) Sonographic Diagnosis of Perforated Meckel's Diverticulum Due to Ingestion of Button Battery. Ann Pediatr Child Care: APCC-100009.