

## BATTERY AND MAGNET INGESTION MIMICS ACUTE APPENDICITIS, A CASE REPORT

### PİL VE MIKNATIS YUTULMASININ AKUT APANDİSİTİ TAKLİT ETMESİ, BİR VAKA RAPORU

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#### ABSTRACT

Most cases of foreign body ingestion are asymptomatic or present with only transient symptoms. Approximately 10–20% of ingested foreign bodies require endoscopic intervention, while fewer than 1% necessitate surgical procedures. In this rare case, we present a patient who was admitted to the clinic with symptoms of acute appendicitis. During evaluation for delayed complications, radiological imaging revealed a foreign body. Intraoperatively, it was discovered that the patient had ingested a button battery and a magnet. Physicians working in pediatric emergency departments should maintain a high index of suspicion and consider foreign body ingestion in the differential diagnosis, especially in patients presenting with acute abdominal symptoms.

**Keywords:** Foreign bodies, Battery, Magnets, Appendicitis

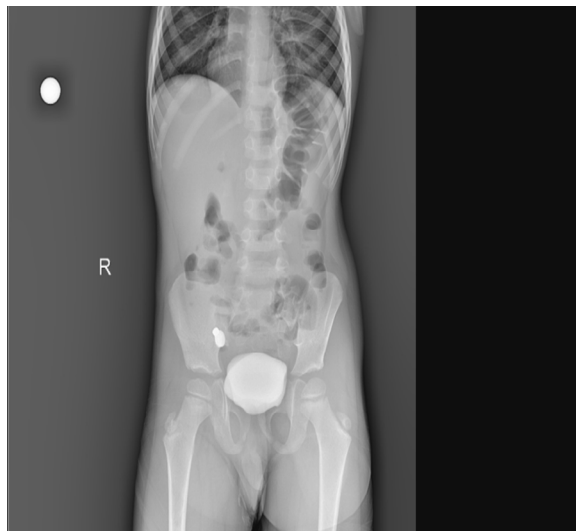
#### ÖZET

Yabancı cisim yutulması ile başvuran vakaların çoğu asemptomatiktir veya yutulduktan sonra geçici semptomlar gösterir. Yutulan yabancı cisimlerin yaklaşık %10-20'si endoskopik müdahale gerektirirken %1'inden daha azı cerrahi müdahale gerektirir. Bu nadir olguda, gecikmiş komplikasyonları olan, akut apandisit kliniği ile başvuran ve radyolojik incelemede yabancı cisim saptanan, intraoperatif olarak düğme pil ve mıknatıs yuttuğu tespit edilen hastayı tartışacağız. Çocuk acil serviste çalışan hekimlerin yabancı cisim yutulmasına karşı yüksek farkındalığa sahip olmaları önemlidir ve özellikle akut batın ile başvuran hastalarda yabancı cisim yutulmasını ayırıcı tanıda göz önünde bulundurmaları gerekmektedir.

**Anahtar Kelimeler:** Yabancı cisimler, Pil, Mıknatıslar, Apandisit

## Introduction

Foreign body ingestion is a common reason for visits to Pediatric Emergency Departments, most frequently observed in children aged between 6 months and 3 years (1). These cases are often evaluated based on a witnessed or reported history of ingestion. However, in some instances, there is no observed history, and diagnosis must rely on clinical symptoms and imaging techniques. Most cases are asymptomatic or present with only transient symptoms following ingestion. Although mortality due to foreign body ingestion is rare, lithium-based batteries and other high-risk objects—particularly multiple magnets—can lead to serious delayed complications (2). This case report discusses a patient who presented with symptoms of acute appendicitis. A foreign body was detected during radiological evaluation, and it was later discovered during surgery that the patient had ingested both a button battery and a magnet.



**Figure-1:** Button Battery and Magnet in the Lower Right Quadrant

## Case presentation

A 5-year-old male patient was brought to the Pediatric Emergency Department with complaints of abdominal pain that began the previous evening, accompanied by two episodes of vomiting. The vomitus contained ingested food. The abdominal pain was diffuse across all quadrants, intermittent, and colicky in nature. The patient had normal gas and stool output. There was no history of fever, diarrhea, constipation, excessive fluid intake, frequent urination, dysuria, kidney stones, or recurrent abdominal pain. The patient had no significant medical history, was not on any medication, and had no history of previous surgeries or known allergies. On examination, the patient appeared in good general condition, and his vital signs were stable. Abdominal

examination revealed tenderness with guarding and rebound tenderness in the right lower quadrant. Other system examinations were normal. Laboratory findings were: Hemoglobin (Hb) 11.7 g/dL, white blood cell count (WBC) 10,720/mm<sup>3</sup> with 72% neutrophil dominance, C-reactive protein (CRP) 29.6 mg/L, and blood glucose 102 mg/dL. Renal and liver function tests were normal. Urinalysis revealed positivity for ketones and urobilinogen but no other abnormalities. Abdominal X-ray did not show air-fluid levels or free air suggestive of obstruction or perforation. An increase in density in the right lower quadrant was identified, which was initially interpreted as a trouser button (Figure 1). Given the clinical suspicion of appendicitis based on the patient's "Pediatric Appendicitis Score," abdominal ultrasound was performed but failed to visualize the appendix, possibly due to a retrocecal position. Abdominal computed tomography (CT) was recommended. The CT scan revealed a metallic foreign body with dimensions of 2x1 cm in the ileocecal region, causing significant artifact, making the appendix indistinguishable. Upon further questioning, the patient's mother recalled that the patient had been playing with a laser battery 2-3 days prior. Broad-spectrum antibiotics (sulbactam-ampicillin 200 mg/kg/day, metronidazole 30 mg/kg/day, amikacin 20 mg/kg/day) were initiated, and the patient was taken to emergency surgery. During surgery, it was observed that the magnet and button battery had caused erosion and necrosis of the intestinal wall in the cecum and ileum, but without perforation (Figure 2).



**Figure-2:** Necrosis of the Intestinal Wall in the Ileocecal Region Caused by Button Battery and Magnet

The right ureter and right iliac artery were adherent to the posterior parietal peritoneum, but no bleeding or urinary leakage was noted. Approximately 15 cm of necrotic bowel was resected, and the surgery was completed. Following surgery, the patient was given

parenteral nutrition, and oral feeding was initiated on the 6th postoperative day. After completing a 10-day course of antibiotics, the patient was in stable condition with good oral intake and no complications, and he was discharged after follow-up.

## Discussion

Commonly ingested foreign objects in childhood include coins, button batteries, toys, toy parts, magnets, needles, jewelry, fish and chicken bones, safety pins, screws, and food. It is reported that 70-80% of ingested foreign bodies pass through the gastrointestinal tract without causing any issues. Approximately 10-20% of cases require endoscopic intervention, and less than 1% require surgical intervention (3). Foreign bodies that pass through the pylorus and into the intestines are usually asymptomatic and pass spontaneously in the stool. However, in rare cases, foreign bodies may remain in the distal gastrointestinal tract and lead to delayed complications.

The increasing use of toys and objects containing magnets and batteries has led to a significant rise in accidental ingestion cases among children (4). Data from North America suggest that in the past decade, the number of surgeries required for ingested magnets has doubled (5). Typically, if a single magnet or button battery is ingested, it progresses through the gastrointestinal tract without causing mucosal damage and is excreted in the stool. However, high-power magnets should be removed immediately due to the risk of perforation (6,7).

Ingested magnets can cause significant complications due to their attractive forces. When multiple magnets or materials with magnetic properties are ingested together, the risk of gastrointestinal complications such as obstruction, ischemia, necrosis, fistula, and perforation increase (8,9). In such cases, if the magnets are not accessible via endoscopy, serial radiographs should be used to monitor progress. Symptomatic patients or those with multiple magnets that do not progress should undergo emergency surgery (6). In a study of 24 cases of accidental multiple magnet ingestion, it was found that 15% of patients were asymptomatic at presentation, while abdominal pain and vomiting were the most common symptoms in symptomatic cases. Perforation occurred in 66% of

cases, most commonly in the jejunum and ileum (10). The use of lithium button batteries has also led to a rise in accidental ingestions, with fatal and serious complications increasing sixfold. Button batteries can cause mucosal damage in the esophagus within one to two hours of ingestion. In a report of 12 patients who ingested button batteries, complications were observed in all five patients who ingested the battery (11). While button batteries that pass the stomach usually pass through the gastrointestinal tract without complications, those causing symptoms such as fever, hematochezia, or abdominal pain should be removed via emergency surgery (12).

The combination of a button battery and a disc magnet presents unique risks. The magnet strongly attracts the button battery, causing pressure-related damage to the intestines. There are few case reports on the combined ingestion of a battery and a magnet. One such case involved a patient who presented with umbilical pain, but without abdominal distension, defense, or rebound. Radiographs revealed two foreign bodies attached to each other in the right lower quadrant. CT scans showed thickening of the terminal ileum and a 1 cm foreign body in the cecum. The magnet and battery were removed laparoscopically. In another case, a patient who ingested a battery and magnet had no initial complaints, and serial radiographs showed the objects passed without intervention. In contrast, our case presented with delayed complications in the intestines, requiring surgical removal of both the battery and magnet, as well as resection of the necrotic intestinal segment (13).

## Conclusion

Over the past two decades, with the rise in the prevalence of technological devices and toys, the incidence of battery and magnet ingestion cases has increased significantly. Physicians working in pediatric emergency departments must maintain a high level of awareness. Foreign body ingestion should always be considered in the differential diagnosis, particularly in patients presenting with acute abdominal symptoms. It is crucial to educate families about the risks associated with toys and other household items containing batteries and magnets to prevent such incidents.

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