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CASE REPORT

Pediatric abdominal pain: identifying fishbone-induced appendicitis

Nawaf Alghamdi[1], Ahmad Basehi[2], Mohammad AlNamshan[3], Fawaz Alzahrani[2], Abdullatif Almalki[2,4*]

ABSTRACT

Background: Appendicitis is a common, but perplexing medical mystery. It occurs unexpectedly and requires rapid medical intervention. Pediatric fishbone-induced appendicitis is a rare but serious condition that is often misdiagnosed because of its nonspecific symptoms. Fish bones are often observed in the gastrointestinal tract during the treatment of such patients. However, in rare cases, the fishbone enters the appendix and causes appendicitis.

Case Report: We report the case of a 5-year-old boy who experienced appendicitis. The patient was admitted to the hospital with severe abdominal pain accompanied by fever, nausea, and vomiting. The pain was identified as fishbone-induced appendicitis. The patient underwent a successful laparoscopic appendectomy without signs of perforation.

Conclusion: Identifying fishbone-induced appendicitis in pediatric patients can be challenging, as most parents fail to recall if their child consumed fish. This case underscores the need for detailed clinical assessment to uncover uncommon causes of appendicitis. Thorough examinations should be conducted to evaluate the possibility of intestinal perforation caused by foreign objects, such as fishbones, and educate parents to avoid serving fish with bones to their children.

Keywords: Appendicitis, fishbone, laparoscopic appendectomy, intestinal perforation, children, pediatric.

Introduction

Appendicitis is the inflammation of the appendix, a small, sack-like organ located in the lower right abdomen [1,2]. It is the most common acute surgical condition affecting the abdomen of children. It occurs in approximately 1% of children annually and peaks in those aged 10-19 years. Boys were slightly more affected, with a lifetime risk of 9%, compared with 7% in girls [3].

Symptoms usually start with vague abdominal discomfort, such as generalized pain around the upper abdomen, which gradually intensifies, becomes sharp, and localizes in the lower right abdomen [4,5]. Although obstruction and fecoliths are common causes, rare causes include foreign bodies, parasites, and tumors [6,7]. Among these, swallowing fishbones is an uncommon cause of appendicitis. The appendix is not the usual site of infection caused by fishbones; however, in rare cases, fishbones can affect the intestines, causing complications [5]. Although most foreign bodies, such as fish bones, pass through the digestive system without complications, approximately 1% result in perforation [6]. Fishbones pose a life-threatening risk by potentially damaging organs and causing intestinal perforation [8,9]. Foreign body-induced appendicitis is underreported in pediatric cases owing to its rarity, nonspecific symptoms, and difficulty in recalling ingestion history [10].

Here, we report a child admitted to the hospital with abdominal pain that was diagnosed as fishbone-induced appendicitis. This report provides valuable insights into the complexities of the diagnosis of abdominal pain and aims to benefit medical professionals and parents.

Case Presentation

A 5-year-old Saudi boy presented to the emergency department with abdominal pain for two days. By day 3, the abdominal pain was progressive and worsening

Correspondence to: Abdullatif Almalki
*King Abdullah International Medical Research Center, Riyadh, Saudi Arabia.
Email: almalkiab6@mngha.med.sa
Full list of author information is available at the end of the article.
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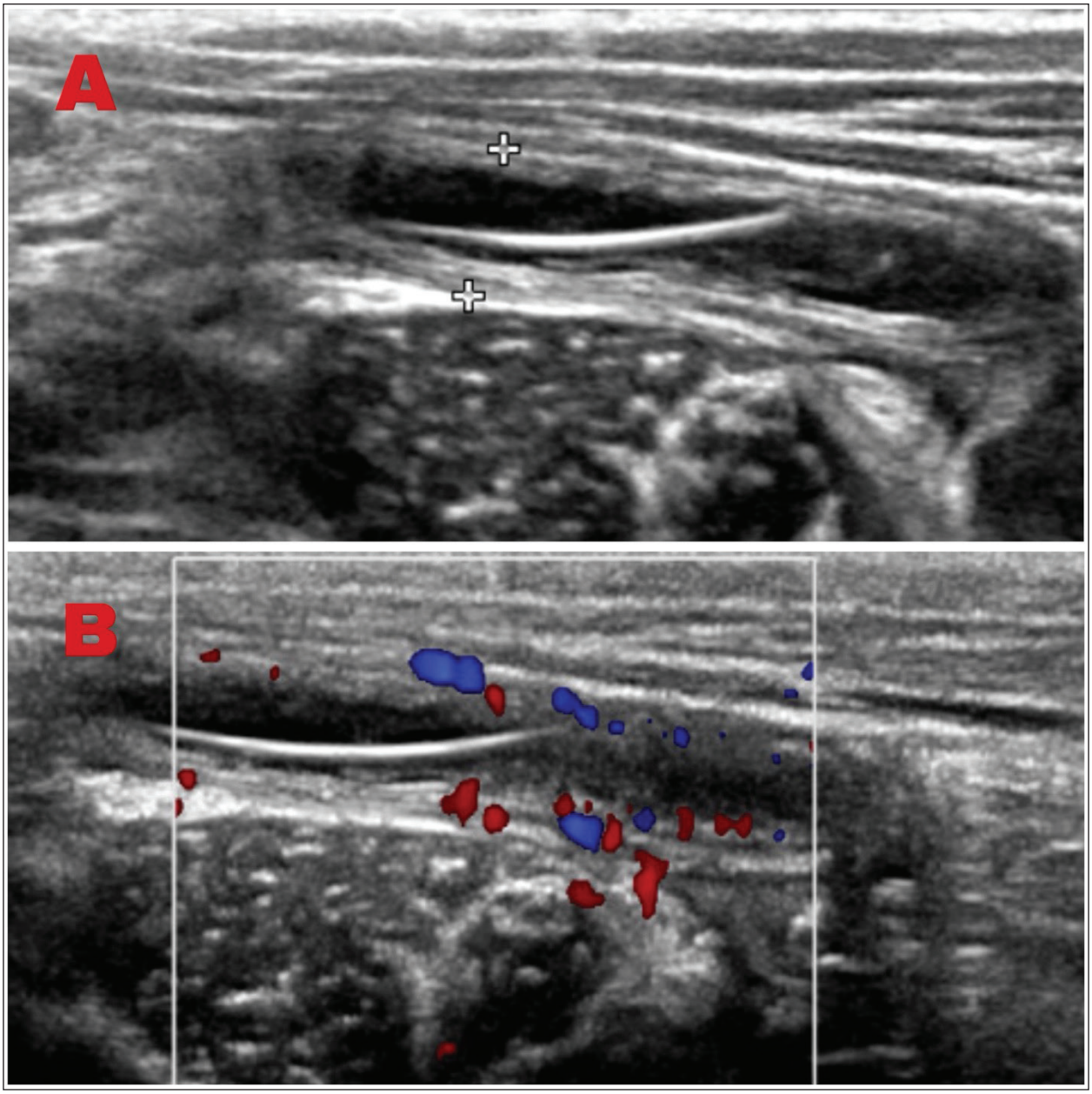

Figure 1. *Fishbone identification in the abdominal cavity (A, B). Vascularity increased after applying color mode by ultrasonography, which indicates an inflamed appendix and shows an echogenic foreign body that appears bright on ultrasonography because of its ability to reflect sound waves, typically indicating a solid or dense material.*

progressively. It was associated with fever, nausea, and vomiting, including one episode of bilious vomiting. The patient's medical history included Down syndrome, type 1 diabetes mellitus, and glomerulonephritis.

Upon examination, the child appeared well, showed a good level of activity, and was well hydrated, but consistently experienced abdominal pain, predominantly in the suprapubic area and right lower quadrant. The patient experienced pain in the right lower limb, mostly in the leg and thigh, without redness or edema but with tenderness and limping. The differential diagnosis of such presentations ranges from surgical abdominal causes and diabetic ketoacidosis to constipation [11].

Laboratory tests revealed normal blood sugar (5.6 mmol/l), negative ketone levels in urine, normal pH, and normal bicarbonate levels. However, inflammatory markers were elevated, including ESR (120 mm/h), CRP (161 mg/l), and WBC (13.3 × 10^9/l). Abdominal ultrasonography was performed because of the suspicion of appendicitis based on the clinical history, examination, and laboratory findings, which showed findings consistent with appendicitis secondary to an internal echogenic foreign body, which was identified as a fishbone (Figure 1).

After completing all required imaging and tests, the pediatric surgery team was involved. Other specialties, such as rheumatology and endocrinology, were involved in clearing the patient preoperatively. It is important to have input from those specialists based on the patient's medical history as the rheumatology team evaluated the stability of glomerulonephritis to manage any underlying autoimmune conditions that could complicate recovery, whereas the endocrinology team managed type 1

diabetes to maintain stable glucose levels perioperatively. Laparoscopic appendectomy was successful, with no signs of perfluorination, which is significant because it reduces the risk of postoperative complications and promotes faster recovery. The patient was administered ceftriaxone in the emergency department, which was continued for 5 days postoperatively. Metronidazole was administered by the pediatric surgery team. Additional medications and precautions were prescribed, and the patient was discharged in stable condition.

Discussion

Fishbone-induced appendicitis is rare in children [12]. Generally, if fishbones are ingested, they pass through the gastrointestinal tract within a week. Approximately 1% of patients experience appendicitis due to sharp and long fishbones [4,13]. Diagnosing appendicitis can be challenging for surgeons because patients or their families may not recall fish consumption, which often leads to misdiagnosis [14]. Appendicitis can be missed in 3.8%-15% of children during emergency department visits.

The appendix is not a common site of infection caused by fishbones; however, infection can occur under specific circumstances. Fishbones may lodge in the gastrointestinal tract, leading to complications, such as perforation and inflammation. In rare cases, fishbones can penetrate the appendix, causing appendicitis, or may create microperforations in adjacent structures, mimicking appendicitis symptoms.

The most common symptoms of appendicitis include abdominal pain, fever, nausea, vomiting, and tenderness. One study found that 95% of the individuals had abdominal pain, 81% had fever, and 39% had local peritonitis [15]. Fishbones are the most common foreign object in areas with high fish consumption [16]. There are no separate symptoms of fishbone-induced appendicitis pain, but it may be revealed after imaging examination or surgical exploration.

Ultrasonography and computed tomography (CT) are valuable imaging modalities for identifying foreign bodies in pediatric appendicitis. Ultrasonography is used as the first-line imaging modality because of its safety, with no radiation exposure, and CT is the gold standard modality of choice. These two modalities have distinct advantages and limitations, as ultrasonography is highly operator-dependent but effective in identifying echogenic foreign bodies, such as fishbones, and assessing signs of appendicitis, such as a thickened appendix, free fluid, or periappendiceal abscess. CT provides superior sensitivity and specificity in detecting foreign bodies and complications, such as perforation or abscess formation. It is less operator-dependent and can identify smaller or less obvious foreign bodies that may be missed on ultrasonography. However, the disadvantage of CT is exposure to ionizing radiation, which is a significant concern in pediatric populations [14].

In this case, ultrasonography effectively identified a fishbone as the cause of appendicitis, reinforcing its use as an initial imaging modality. However, in cases with inconclusive ultrasonography findings or complex presentations, CT can be a valuable complementary tool to confirm the diagnosis and guide management [14].

This is an effective surgical method to remove foreign objects from the abdomen [4,17], and perioperatively, a sharp fishbone was found. After the fishbone was removed, the perforation site was stitched, the abdomen was cleaned, and incisions were carefully closed. The patient was in stable condition and discharged after receiving the necessary medications.

Conclusion

Identifying fishbone-induced appendicitis is difficult because most patients do not remember if the fish was consumed by their children. Consequently, parents were unable to recall their children's food histories over the past few months. In the current case, the fishbone was identified by careful abdominal examination and bedside abdominal ultrasonography. Surgery was successfully performed, and the patient was discharged with some precautions.

Recommendations

This case study recommended that if a child presents with abnormal abdominal pain, medical staff should conduct a detailed examination to evaluate intestinal perforation due to a foreign object, such as a fishbone. In the case of a foreign object, laparoscopic surgery is recommended after proper blood tests. It is recommended that families should not feed their children fish with bones. Parents were responsible for removing all bones before serving the fish to their children. Besides removing fishbones, parents are encouraged to supervise their children during meals to ensure safe eating habits. Moreover, it is important to educate families about the risks of foreign body ingestion and teach children to eat slowly and carefully to prevent such incidents.

List of Abbreviations

CT Computed tomography

Conflict of interest

The authors declare no conflicts of interest.

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Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

Author details

Nawaf Alghamdi[1], Ahmad Basehi[2], Mohammad AlNamshan[3], Fawaz Alzahrani[2], Abdullatif Almalki[2,4]

1. Pediatric Department, King Abdullah Specialist Children's Hospital, King Abdulaziz Medical City, Ministry of National Guard Health Affairs, Riyadh, Saudi Arabia
2. Pediatric Emergency Department, King Abdullah Specialist Children's Hospital, King Abdulaziz Medical City, Ministry of National Guard Health Affairs, Riyadh, Saudi Arabia
3. Pediatric Surgery Department, King Abdullah Specialist Children's Hospital, King Abdulaziz Medical City, Ministry of National Guard Health Affairs, Riyadh, Saudi Arabia

4. King Abdullah International Medical Research Center, Riyadh, Saudi Arabia

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