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Case Report

Appendicoileal knotting and Appendicoileal fistula in a-13-year-old child: rare complication of appendicitis: A case report

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Abstract

Introduction: *Acute appendicitis is an inflammation of the appendix, which is the most common abdominal surgical emergency. If left untreated, appendicitis can rupture with abscess formation. Rarely, it can lead to fistula formation in other organs or form a knot and cause bowel obstruction. Both appendicitis knot and appendicoileal fistula occurrence in the same patient are rare complications of acute appendicitis.*

Case presentation: *We present the first case of appendicoileal knot with appendicoileal fistula in a 13-year-old male patient who presented with abdominal distension of 3 days duration with failure to pass feces and flatus and crampy abdominal pain. Abdominal examination revealed a distended abdomen, visible bowel loops, and tenderness at the lower abdomen bilaterally. Multiple air-fluid levels were seen on an erect abdominal X-ray. With a diagnosis of small bowel obstruction, he underwent exploratory laparotomy. Intraoperative, the appendix was wrapped around a loop terminal ileum and its tip had fistulous communication with the ileum. For this appendectomy and ileal resections with end-to-end anastomosis were done.*

Conclusion*: Appendicoileal knot and/or fistula formation should be expected as a cause for small bowel obstruction in patients with appendicitis. Laparotomy is the treatment modality for patients with bowel obstruction due to appendicitis.*

Keywords*: Appendicoileal fistula, Acute appendicitis, Case Report, Knotting of appendix*

Background

Acute appendicitis is an inflammation of the appendix which is the most common abdominal surgical emergency in the world, with an annual incidence of 96.5 to 100 cases per 100,000 adults (1).

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When appendicitis is left untreated it usually progresses to rupture with abscess formation. (2) Occasionally it may form a fistula which defines primary perforation of the appendix to an adjacent hollow viscus or the skin the commonest fistula being with that of the urinary bladder. A fistula with ileum is a rare occurrence. (3,4)

Appendicitis also can cause adynamic or mechanical small bowel obstruction (SBO) and the most common is due to paralytic ileus as adynamic obstruction. Mechanical obstruction results from adhesion, herniation, bowel torsion, kinking of the bowel, or knotting. The tip of a long appendix is typically found adhered to the cecum, retroperitoneum, and mesentery of ileum, forming a potential space where a loop of the bowel may be entrapped. Rarely The tip of a long appendix can adhere to the ileum causing knotting that leads to bowel obstruction (5–7). Until now, there was no known report of a concomitant appendicoileal fistula and appendicoileal knot. Due to the rare presentation of concomitant appendicoileal fistula and appendicoileal knot and its challenging nature to preoperative diagnosis, we discuss the first case report of concomitant appendicoileal fistula and appendicoileal knot.

Case presentation

A patient, age of 13 years old male clinically presented to the surgical emergency unit with abdominal distension of 3 days duration, which started from the lower part of the abdomen and progressively involved the whole abdomen. In association with this, he has also a history of failure to pass feces and flatus of 4 days duration. He has also a history of crampy -type severe abdominal pain in the lower and central part of two days duration. In addition to this, he has also a history of vomiting of ingested matter of 3-4 episodes per day of 2 days duration. He has also a history of urinary urgency and frequency otherwise he has no history of diarrhea, fever, a headache. He has no history of previous surgery and no history of radiation.

Objectively, he looked acutely sick looking at the presentation, was in pain, and had a pulse rate of 90 beats per minute, respiratory rate of 22 breaths per minute, a temperature of 36.70c, and blood pressure of 120/75 mmHg. He had wet buccal mucosa no sunken eyeball and prominent zygoma. His abdomen was distended and moves with respiration and visible bowel loops, with no visible peristalsis. There was a lower abdominal direct tenderness with hyper tympanic percussion note over the epigastric area, right and left upper quadrant of the abdomen, and dullness over the hypogastric, right, and left lower abdominal quadrants. No signs of fluid collection fluid collections were detected. The bowel sound was normoactive and the other systems examination was normal.

Laboratory work-up reveals unremarkable complete blood count results. Plain Abdominal x-ray shows centrally located multiple air-fluid levels, and a distended bowel loop (see Figure 1).

Figure 1: Plain abdominal erect x-ray showing multiple air-fluid levels and dilated bowel

Emergency laparotomy was done intra-operatively, the appendix wrapped around the loop of the terminal ileum adhered and perforated into the mesenteric ileum at about 60 cm from the ileocecal valve (see Figures 2 and 3). Both the appendix and ileum appear viable on the gross inspection with a minimal fibrous deposit on the terminal ileum. There was no pus with an intraoperative diagnosis of small bowel obstruction secondary to appendicoileal knot and appendicoileal fistula, appendectomy, resection, and end-to-end anastomosis were done. The sample was not sent for histopathology. The post-operative period was uneventful and the patient was on maintenance fluid, Ceftriaxone 1 gram intravenously twice per day, Diclofenac intramuscularly as analgesic, and wound care daily.

Figure 2: Gross anatomy of the appendix showing appendix formed knot to the distal ileum

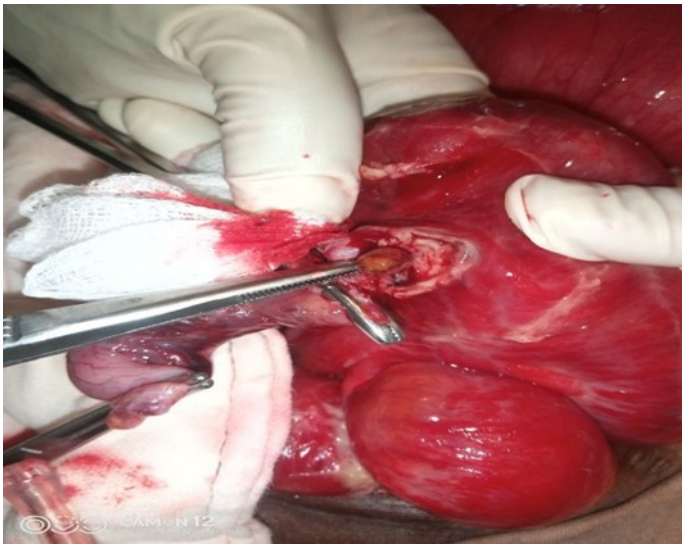

Figure 3: Gross anatomy of the appendix showing the appendix forming a fistula with the distal ileum

Discussion

Right lower fossa inflammatory disease's course was largely unknown until the 19th century when the appendix was discovered to be the primary cause of the majority of cases (8). The appendix is a finger-shaped organ that extends 8 cm from the infero-medial margin of the cecum. Of all surgical emergencies, worldwide appendicitis is the most common it accounts for 96.5 to 100 cases per 100,000 adults.(1) The predominantly affected age group is between 10 to 19 years with slight male predilection (male to female ratio of 1.4:1) with a lifetime risk of 8.6% and 6.7% for males and females respectively (9). The commonest symptom of appendicitis is right lower quadrant abdominal pain. Other common symptoms are nausea and vomiting. Fever is less common and occurs in 15% of cases. Risk of perforation for appendicitis in the pediatric age group is more common in the male gender and the presence of vomiting, diarrhea, fever, elevated white blood cell count (WBC) levels, and high C-reactive protein (CRP) were identified as predictors of a perforated appendix (10,11).

The natural course of the inflamed appendix is either progression to rupture with abscess formation or forming fixation of the appendix to the neighboring viscus or the parietal peritoneum. The most common sites of these fistulae are to the bladder, skin, vasculature, umbilicus, and to the gastrointestinal tract (12). Appendicoileal fistula is a rare occurrence. The symptoms include abdominal pain, signs of intestinal obstruction, and a palpable abdominal mass (13). There is a case report of appendicoileal fistula presenting as acute ileus (14). Appendicitis can also present with intestinal obstruction most commonly due to mechanical obstruction. The mechanisms of obstruction can be due to adhesion, herniation, bowel torsion, kinking of the bowel, or knotting(7).

Appendicular knotting is formed when the tip of the appendix adheres to the small bowel, cecum, or peritoneum which gives a ring-like structure. A portion of the small bowel usually herniates through that ring or knot forming a closed-loop obstruction with or without strangulation. The portion of the ileum herniates through the knot resulting in closed-loop obstruction (5). Our patient presented with a feature suggestive of SBO which is abdominal distension, vomiting, and failure to pass feces and flatus.

Preoperative diagnosis is challenging. A plain abdominal X-ray may be important to diagnose small bowel obstruction without identifying the cause. Abdominal Computed Tomography (CT) scan and abdominal ultrasound (U/S) are very useful in the diagnosis of acute appendicitis with limitations in diagnosing obstruction due to appendicitis (5,7). In our patient plain abdominal x-ray was done and it showed a centrally located air-fluid level and distended bowel loop suggestive of bowel obstruction.

Laparotomy is the best operative management for intestinal obstruction caused by appendicitis. If the bowel is viable, an appendectomy and relieving of the strangulated loop bowel will be done. But if the bowel is gangrenous, in addition to appendectomy resection and anastomosis or stoma creation should be done (5,7). For our patient, laparotomy was done and appendectomy resection, and end-to-end anastomosis were done.

Conclusion

Appendicitis can cause mechanical intestinal obstruction. Obstruction is due to forming a fistula with the bowel or forming a knot through which the bowel herniates. Diagnosis of intestinal obstruction due to appendicitis is challenging. A plain abdominal film can show you obstruction without identifying the cause. Abdominal U/S and CT scans have a limitation in the diagnosis. A laparotomy is a treatment option. Appendectomy and relieving obstruction or resection and anastomosis or stoma formation are the mainstay of treatment.

Abbreviation

CRP- C Reactive Protein

CT- Computed Tomography

SBO- Small Bowel Obstruction

U/S- Ultrasound

WBC- White Blood Cell

Declarations

Ethical clearance

Ethical clearance was obtained from Arbaminch University Research Ethics Review Board protocol with approval number No MA9.

Consent for Publication

Written informed consent was obtained from the patient's legal guardian for publication of this case report and any accompanying images.

Availability of data and materials

Not applicable

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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Authors' contributions

M A.- Conceptualization and writing draft

A N., SY. and MN.- writing, editing, arranging for publication and collecting data involved equally,

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