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Twists and turns: A rare case of appendiceal torsion unraveled

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ABSTRACT

Vermiform appendix torsion is a rare acute abdominal emergency in the pediatric population, with possibly 25 case reports appearing in English-language publications since 1918, when it was initially described, surgeons mostly accidentally found it during surgery. It can be primary or secondary. Clinical manifestations mimic acute appendicitis. This vermiform appendix torsion is a case report of a 9-year-old girl who had her appendix twisted on itself 360 degrees in an anticlockwise direction. A late diagnosis can result in the appendix being gangrenous. We report a case of a 9-year-old girl who presented to the emergency department with abdominal pain, non-bilious vomiting, constipation, and fever. Laboratory data revealed a white cell count of 19,000 per microliter, with 74% neutrophils. Abdominal Ultrasound was inconclusive. Surgeons performed an emergency laparoscopic exploration with a provisional diagnosis of acute appendicitis. A laparoscopic examination revealed an anticlockwise 360° twist in the appendix. They performed an appendectomy, and the recovery after the procedure went smoothly. Vermiform appendix torsion is a highly uncommon ailment that might be challenging to differentiate from acute appendicitis. Late detection and inappropriate management plans can result in the appendix gangrene and perforation. In pediatric patients with acute abdominal pain, it is critical to consider appendicular torsion as a differential diagnosis.

Keywords: Vermiform appendix, Torsion, Appendicitis, Abdominal pain, Case report

1. INTRODUCTION

Vermiform appendicular torsion is one of the rare pathologies in acute abdomen in the pediatric population. The first case was documented in 1918. The torsion has an unknown origin that can occur in both primary and secondary forms. An appendix anatomical defect causes the primary form, while fecal matter, cystadenoma, appendix duplication, mucocele, carcinoid tumor, lipoma, or adhesion cause the secondary form. The appendicular volvulus, with subsequent development of venous obstruction and later ischemia, complicated with

bacterial invasion, has been reported to lead to autoamputation and misdiagnosed with appendicular agenesis (Val-Bernal et al., 1996; Kilincaslan et al., 2013). Acute appendicitis and primary acute torsion of the vermiform appendix are identical before surgery (Val-Bernal et al., 1996). Below, we report a patient who presented to our hospital with a clinical picture suggestive of acute appendicitis and intraoperative diagnosis of appendicular torsion.

2. CASE REPORT

A 9-year-old child with lower abdomen pain on the right was seen in the emergency room four days ago. Her symptoms were associated with non-bilious vomiting, constipation, and fever. No anorexia or diarrhea. No urinary symptoms. No history of recent infection. She denied any medical or surgical history. On examination, the patient looked well and vitally stable. A physical examination of her abdomen showed rebound discomfort in the right iliac fossa and guarding in the right lower quadrant. The observer documented a positive Psoas sign. They found right-sided discomfort and excellent anal sphincter tone during a digital rectal examination. The white cell count in the laboratory was 19,000 per microliter, with 74% neutrophils. Other laboratory data were average. Abdominal Ultrasound was inconclusive. The patient was diagnosed with acute appendicitis.

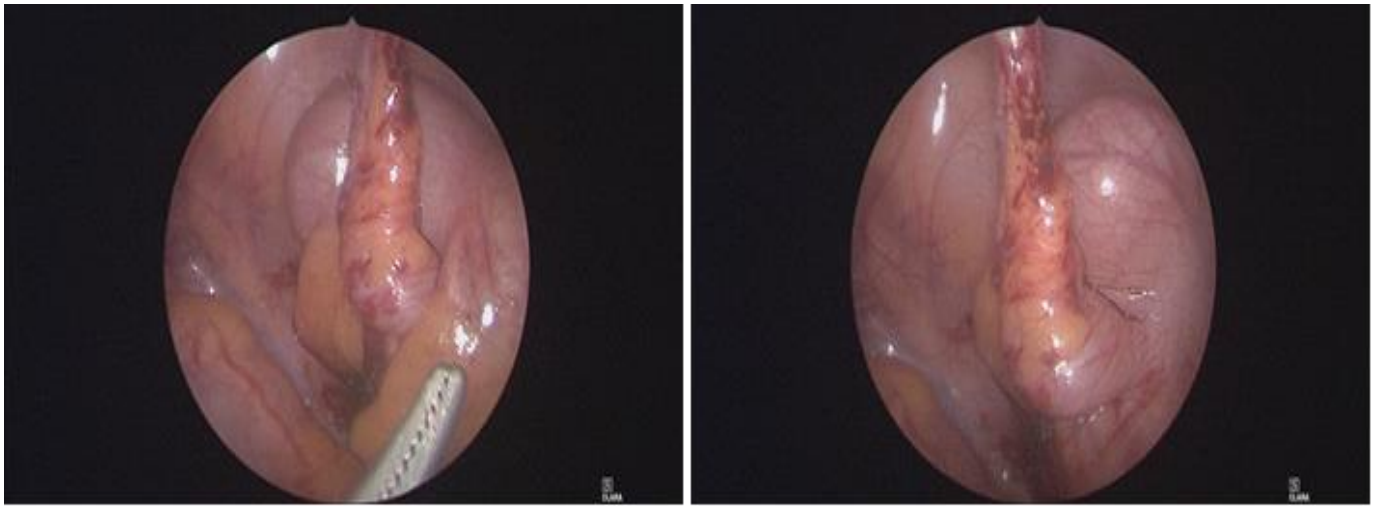

Figure 1 & 2 Intraoperative view of the 360° anticlockwise the vermiform appendix's torsion.

The medical team performed an emergency laparoscopic exploration. Intra-operatively, they faced multiple thick adhesions surrounding the appendix, and after proper adhesiolysis, they identified the appendix. It showed mild inflammation congestion, and its base appeared to be twisted 360° in an anticlockwise direction with no gangrene or perforation (Figure 1 & 2). After a complete detorsion, the team proceeded with an appendectomy. Both ovaries looked healthy and normal. The pelvis had no free fluid. The bowel was run out to exclude other pathologies, such as Meckel's diverticulum, which was negative. The pathology report revealed that the length of the appendix was 5 cm long distal to the site of torsion the lumen was dilated with a plant foreign body and egg-like structure with a picture of early acute appendicitis. The patient recovered uneventfully, and the healthcare team sent her home the day following surgery.

3. DISCUSSION

The vermiform appendicular volvulus is one of the extremely rare etiologies of abdominal pain in the pediatric population. The appendicular volvulus could be either primary or secondary. In the pediatric population, the appendicular volvulus is usually due to primary causes, including a narrow base of mesentery, lack of zygotic folds to fixate the appendix, peristaltic motions, laxative use, and intense physical activity. In such a pediatric population, a secondary cause of volvulus is rare. In another study, a two-year-old boy had appendiceal volvulus caused by lymphoid hyperplasia. Secondary causes mostly reported in adults include mucoceles, fecaliths, and tumors (Ejtehadi et al., 2017; Colucci and Herren, 2023; Hirpara and Azzie, 2018). Inoue's study reported a small bowel obstruction

appeared with appendicular torsion in a pediatric patient who presented with acute abdominal pain. During the procedure, the appendix encircled the strangulated ileum (Inoue et al., 2013).

The presenting clinical picture of the appendicular volvulus, as reported in the literature, is indistinguishable from the picture of acute appendicitis, as in our case, and could barely be diagnosed by pre-operative imaging such as Ultrasound or computed tomography (CT) of the abdomen. One of the rare clinical presentations of appendicular torsion is palpable right lower abdominal mass with a picture of perforated acute appendicitis. Nearly half of the cases involved counterclockwise torsion. The degree of torsion ranged between 180° and 1080° degrees (Kilincaslan et al., 2013). An appendicular volvulus case has been diagnosed pre-operatively with radiological findings by an abdominal CT, which showed a dilated appendix, peri-appendiceal fluid, no fecalith, and twisting of the base of the appendix (Hashimi and Barthel, 2021). As reported in the literature, the target sign is one of the ultrasonographic features that raises clinical suspicion of the appendicular volvulus (Hamada et al., 2007).

The pathophysiology of appendicular torsion is still poorly understood; however, several features have been reported retrospectively in the literature. The appendix is often located in the pelvis, is longer than 7 cm, and rotates frequently in a counterclockwise orientation (Gopal et al., 2005). In some cases, there was no explanation of appendicular torsion except that it may be due to self-detorsion (Dimitriadis et al., 2012). It is still unclear if appendix inflammation leads to torsion or vice versa, as bacterial overgrowth caused by ischemia could induce inflammation. Therefore, we should include appendicular volvulus as a differential diagnosis of right lower abdominal pain miming acute appendicitis (Dubhashi and Khadav, 2016). Although this condition is scarce, early recognition is substantial to prevent morbidity as the consequences of late presentation and, thus, delay in the management could worsen the ischemia, with subsequent gangrene or perforation of the appendix (Bhojwani et al., 2021).

4. CONCLUSION

In a rare pediatric emergency, vermiform appendix torsion is primarily detected intraoperatively and presents clinically like acute appendicitis. An improper course of treatment could cause the appendix to necrotize and perforate. When diagnosing juvenile patients with acute stomach discomfort, it is imperative to exclude appendicular tumors.

Author Contributions

Muayad A Alfarsi, Mohamed Khaled S Zaky, Amal Sayfuldeen Qari, and Amr Elyas participated in the protocol design, data collection, analysis, and study writing. All authors reviewed and approved the final manuscript.

Informed Consent

Study participant gave oral consent, and additional informed consent was obtained from participant for whom identifying information is included in this manuscript.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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