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Case Report

Paracecal appendicitis in a rare anatomical position: a case report describing a modified laparoscopic approach

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ABSTRACT

Anatomical variations of the appendix, such as a paracecal adherent position, are uncommon and may complicate both diagnosis and surgical management. While laparoscopic appendectomy remains the gold standard, this variant poses challenges in mobilization, vascular control, and cecal protection. We describe a 47-year-old female presenting with acute appendicitis, where contrast-enhanced computed tomography (CT) revealed a retrocecal appendix with paracecal adherence. At laparoscopy, necrotizing appendicitis in an unusual paracecal position was confirmed. A modified surgical strategy was applied, combining retrograde appendectomy with a lateral-to-medial dissection. This approach facilitated early vascular control, safe mobilization of the appendix, and secure division of the base without the use of staplers or endoloops. The operative time was 60 minutes, with minimal blood loss, and the patient had an uneventful recovery, being discharged on postoperative day three. Paracecal adherence represents a rare but technically demanding variant. Our combined retrograde and lateral-to-medial approach provided advantages in hemostasis, cecal protection, and operative efficiency. Compared to conventional methods, it minimized the risk of bleeding and avoided cecal injury, while also being cost-effective. This case highlights the feasibility and safety of a modified laparoscopic technique for paracecal adherent appendicitis. Broader validation in larger cohorts is warranted, but this strategy may represent a valuable alternative for surgeons encountering rare anatomical variants.

Keywords: Appendectomy, Appendicitis, Laparoscopy, Paracecal appendix, Retrograde appendectomy

INTRODUCTION

Acute appendicitis affects approximately 7–8% of individuals during their lifetime, with the base of the appendix typically located in the right iliac fossa, although the tip and orientation may vary considerably.[1] These anatomical variations can lead to differences in clinical presentation, diagnostic accuracy, and surgical management. Among them, the paracecal adherent appendix is one of the rarest, reported in only 0-12% of cases.[2-4]

While laparoscopic appendectomy remains the gold standard, this particular anatomical position presents significant technical challenges, including difficulty in mobilizing the mesoappendix, controlling the appendiceal artery, and performing adhesiolysis without injuring the cecum.[5] Such difficulties may prolong operative time and increase the risk of bleeding or bowel injury. To address these challenges, we describe a case of paracecal adherent appendicitis managed with a modified laparoscopic approach, highlighting its feasibility and potential as an effective and safe alternative in this uncommon anatomical scenario.

CASE REPORT

Written informed consent was obtained from the patient for participation in this study and for publication of this case report and accompanying images.

A 47-year-old female presented to the Emergency Department with a two-day history of epigastric pain migrating to the right iliac fossa, associated with vomiting

of gastric contents but no hematemesis, fever, anorexia, urinary, or gynecological symptoms. Past medical history was unremarkable. On examination, she was alert and hemodynamically stable (pulse 76 bpm, blood pressure 130/70 mmHg, temperature 37.1°C, respiratory rate 18/min, BMI 20.8 kg/m²). Abdominal examination revealed localized tenderness in the right iliac fossa without guarding; other systems were unremarkable. Laboratory findings showed leukocytosis (WBC 13.8 $\times 10^3/\mu l$) and CRP 4.7 mg/l. Contrast-enhanced abdominal CT demonstrated a retrocecal appendix extending upward, 11 mm in diameter, with intraluminal fecalith, periappendiceal fat stranding, and minimal free fluid (Figure 1).

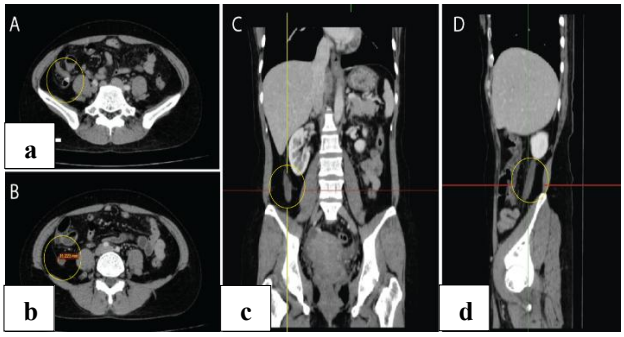

Figure 1: Contrast-enhanced abdominopelvic CT of a patient with paracecal appendix, (a) enlarged appendiceal base with obstructing fecalith, (b) dilated appendix in transverse view, (c) coronal view of the appendix, and (d) sagittal view of the appendix.

A diagnosis of perforated necrotizing appendicitis with localized peritonitis was established, and emergency surgery was indicated. Intraoperatively, turbid fluid was noted in the right abdomen and Douglas pouch, with the appendix identified in a paracecal adherent position and showing necrotic inflammation.

An emergency laparoscopy was performed using a modified approach that combined retrograde appendectomy with a lateral-to-medial dissection strategy, as demonstrated by intraoperative findings (Figure 2) and illustrated schematically in the operative diagram (Figure 3).

A 10-mm trocar was placed at the umbilicus for the laparoscope, with two additional working ports in the left and right iliac fossae. Adhesiolysis was initiated by incising the medial peritoneal layer of the mesoappendix with a monopolar hook, followed by opening of the lateral layer. Blunt dissection with suction was then used to create an avascular window near the appendix body, minimizing the risk of bleeding. The mesoappendix was divided progressively: first toward the tip using bipolar cautery to mobilize the appendix, then toward the base from the left trocar, which facilitated safe exposure of the appendiceal base. Pericecal fat was carefully dissected with a monopolar hook from the left-sided trocar until the appendix was fully mobilized and returned to its anatomical position, enabling secure ligation and division of the base. The peritoneal cavity was thoroughly irrigated and aspirated, and no drain was placed.

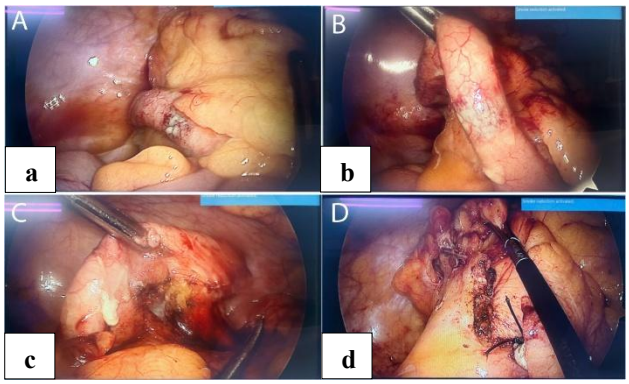

Figure 2: Operative images of a patient with paracecal adherent appendix, (a) A paracecal adherent appendix was identified upon initial laparoscopic inspection, (b) gentle traction was applied to grasp and expose the appendix along with its mesoappendix, (c) creation of a transmesoappendiceal window close to the appendiceal wall using a suction device, and (d) appendiceal base and residual mesoappendix following appendectomy).

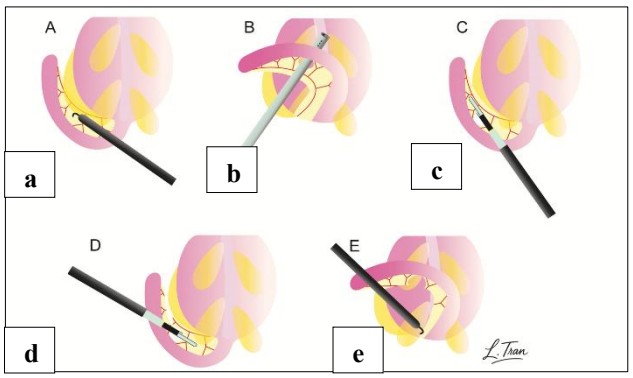

Figure 3: Modified laparoscopic approach for appendectomy in paracecal adherent appendix, (a) adhesiolysis and medial peritoneal incision of the mesoappendix using monopolar hook cautery, (b) creation of a transmesoappendiceal window close to the appendiceal wall with a suction device, avoiding injury to the appendiceal artery, (c) division of the mesoappendix toward the appendiceal tip with bipolar cautery, (d) division of the mesoappendix toward the appendiceal base using bipolar cautery applied from the left trocar, and (e) dissection around the appendiceal base with monopolar cautery introduced via the left trocar).

The total operative time was 60 minutes, including approximately 20 minutes from skin incision to complete mobilization of the appendix, 10 minutes for ligation, division, and specimen retrieval, and 30 minutes for

peritoneal lavage, aspiration, and trocar site closure, with minimal blood loss of less than 5 ml.

Postoperatively, the patient recovered uneventfully, resumed oral intake, passed flatus and stool, experienced minimal wound pain, and was discharged on postoperative day three. At the one-week follow-up, the patient showed no postoperative complications.

DISCUSSION

A paracecal adherent appendix represents one of the rarest anatomical variations of appendiceal position, with a reported incidence ranging between 0 and 12% in published series. Harrison et al conducted a comprehensive review of studies indexed in PubMed and Medline from 1909 to 2002, reporting that the incidence of paracecal appendicitis ranged from 0 to 12%.[2] In Brazil, Souza et al analyzed 377 cases and found a paracecal incidence of 5.8%.[3] In Kenya, Mwachaka et al examined 48 cases and documented only a single instance of acute paracecal appendicitis.[4] This variation often poses significant diagnostic and surgical challenges due to altered anatomical orientation, difficulty in mobilizing the appendix, and the potential risk of iatrogenic injury to the cecum or adjacent structures. As laparoscopic appendectomy has become the gold standard worldwide, the presence of unusual anatomical variants such as paracecal adherence continues to test the skill and adaptability of surgeons.[5]

In the present case, we employed a modified laparoscopic approach that combined retrograde appendectomy with a lateral-to-medial dissection strategy. This approach offered several technical advantages. First, retrograde dissection enabled early control of the appendiceal artery, thereby minimizing the risk of intraoperative bleeding. Second, the lateral-to-medial mobilization facilitated safer identification of the appendiceal base, particularly in situations where dense adhesions or aberrant fixation obscure conventional landmarks. Third, this method may contribute to shorter operative times and reduced risk of inadvertent cecal injury, which is a recognized concern in cases of paracecal adhesion. The operative time was 60 minutes, compared with approximately 75 minutes reported in international studies.[6] In addition, our approach provides a cost advantage by avoiding the use of staplers and endoloops.

Several studies have emphasized the importance of tailoring laparoscopic techniques to anatomical variations. For example, Ko et al highlighted that retrograde appendectomy could be advantageous in cases of retrocecal or adherent appendices.[7] Our technique adds to this body of evidence by demonstrating that a combined retrograde and lateral-to-medial strategy may provide additional safety and efficiency.

Nevertheless, this report has inherent limitations. The experience is based on a single patient, which precludes definitive conclusions about reproducibility, learning curve, or long-term outcomes. Although the intraoperative course was uneventful and the patient recovered well, potential challenges - such as uncontrolled bleeding, cecal injury, or prolonged operative time - may occur in different settings or with less experienced surgeons. Furthermore, our case does not address postoperative complications, which would require larger series or prospective studies to evaluate adequately.

Therefore, while this case illustrates the feasibility and potential advantages of a modified laparoscopic strategy for paracecal adherent appendicitis, broader validation is needed. Future research should focus on multicenter prospective studies with larger sample sizes to better assess operative safety, efficiency, and patient outcomes. Such evidence would help define whether this approach can be recommended as a standard option in managing rare but challenging paracecal appendicitis.

CONCLUSION

This case illustrates that a modified laparoscopic approach, combining retrograde appendectomy with a lateral-to-medial dissection, is feasible and safe. The technique offers advantages in bleeding control, operative efficiency, and protection of the cecum. Further studies with larger cohorts are needed to confirm its broader applicability.

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