Case Report

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Classic yet challenging case of stump appendicitis: a case report

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Introduction: Stump appendicitis is a rare complication of appendectomy in which residual appendiceal tissue becomes inflamed, mimicking acute appendicitis. This case report highlights the classic clinical presentation, diagnosis, and management of stump appendicitis.

Case presentation: A 61-year-old male presented with abdominal pain and a past history of open appendectomy performed 4 years prior. Clinical examination, laboratory, and radiological findings were highly suggestive of stump appendicitis. Surgical exploration confirmed an inflamed appendiceal stump, which was resected, and the patient had an uneventful recovery postoperatively.

Discussion: Stump appendicitis is a rare but important differential diagnosis in patients with a history of appendectomy who present with acute abdominal pain. Delayed diagnosis can result in complications such as perforation and peritonitis. Imaging plays a crucial role in diagnosis, and surgical resection, typically performed through open-completion appendectomy, remains the treatment of choice.

Conclusion: Although stump appendicitis is rare, it should always be considered in patients with a prior appendectomy who present with acute abdomen. Early recognition and prompt surgical intervention are essential to prevent morbidity and mortality.

Keywords: appendectomy, case report, complications, computed tomography, stump appendicitis

Introduction

Acute appendicitis is one of the most common inflammatory conditions of the gastrointestinal tract, and appendectomy is one of the most frequently performed gastrointestinal surgeries worldwide[1,2]. Stump appendicitis was first defined in 1945 as a condition where any appendiceal tissue retained after an appendectomy becomes inflamed again[2]. It is estimated that ~1 in 50 000 appendectomy cases, whether by open or laparoscopic approach, result in stump appendicitis[3]. Stump appendicitis presents similarly to acute appendicitis, with symptoms such as right lower quadrant or epigastric abdominal pain, fever, nausea, and vomiting[4]. As with typical appendicitis, delayed diagnosis and treatment can result in complications such as perforation and peritonitis[5]. The preferred diagnostic tool for stump appendicitis is contrast-enhanced computed tomography (CE-CT) of the abdomen and pelvis, with completion appendectomy being the treatment of choice[6].

Although stump appendicitis is a rare postappendectomy complication, with only a few cases reported in the medical literature, it must always be considered a differential diagnosis in patients with a history of appendectomy who present with acute abdominal pain. Prompt recognition of this differential diagnosis can prevent fatal complications.

HIGHLIGHTS

- Stump appendicitis is a rare complication of appendectomy, where residual appendiceal tissue becomes inflamed, often mimicking the symptoms of acute appendicitis.
- Clinical presentation includes typical symptoms of acute appendicitis, in patients with a prior history of appendectomy, as demonstrated in this case of a 61-year-old male with a history of open appendectomy.
- Imaging, particularly computed tomography, plays a vital role in diagnosing stump appendicitis.
- Delayed diagnosis can lead to serious complications, including perforation and peritonitis, underscoring the need for timely identification.
- Surgical resection remains the definitive treatment, often performed as an open-completion appendectomy.

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Case presentation

A 61-year-old male presented with sudden diffuse pain in the periumbilical region for 30 h, eventually localizing to the right lower abdomen. There were no aggravating or relieving factors. The pain was associated with one episode of nonbilious, non-blood-stained vomiting. He had a known history of hypertension for 1 year but was not on any medication. He also had a history of an open appendectomy performed 4 years ago for acute appendicitis and was a chronic alcoholic. On examination, he appeared ill but was not pale, icteric, or cyanotic. His pulse rate was 108 beats per minute, respiratory rate was 18 breaths per minute, blood pressure was 126/84 mmHg, and his temperature was 98.4°F with an oxygen saturation of 96% on room air. Abdominal examination revealed a healed scar from a gridiron incision in the right iliac fossa, with tenderness, rebound tenderness, and guarding at the same site.

Routine laboratory tests were normal, except for a leukocytosis of 12 500 cells/mm³, with 85% neutrophilic predominance. Ultrasonography of the abdomen and pelvis was unremarkable. However, CE-CT of the abdomen and pelvis (Fig. 1) revealed an outpouching ~1.4 cm in size arising from the cecum just anterior to the ileocecal junction, along with surrounding fat stranding. Based on the clinical and radiological findings, a diagnosis of stump appendicitis was made.

The patient was taken to the operating room, where a gridiron incision was made. Upon opening the peritoneum, an inflamed appendiceal stump (Fig. 2) with thickened, adherent omentum was found. The stump was excised, and the omentum was ligated. The tissue sample was sent for histopathological examination (Fig. 3), which confirmed the diagnosis of stump appendicitis. The patient recovered well postoperatively and was discharged on the fourth postoperative day without any complications.

Discussion

While nonsurgical conservative approaches have been recognized as viable for certain cases in recent years, the definitive treatment for acute appendicitis remains surgery, either through open or laparoscopic appendectomy[7]. Postoperative morbidities, including surgical site infection, ileus, intra-abdominal abscess, and adhesive bowel obstruction, can occur during the early or late postoperative period[8]. One of the rarest and often overlooked complications is stump appendicitis, which is prone to delayed diagnosis and associated complications. Kanona *et al*.[5] conducted a literature review indicating that stump appendicitis can develop anywhere from 9 weeks to 50 years after an incomplete appendectomy, with no definitive time frame for the onset of the complication.

More common conditions that may mimic stump appendicitis include epiploic appendagitis, terminal ileitis, right-sided colitis (ischemic or inflammatory), and cecal diverticulitis[9]. Clinical and laboratory findings in stump appendicitis closely resemble those of acute appendicitis, highlighting the importance of diagnostic imaging, with CE-CT being the preferred method[9]. On ultrasonography, residual appendiceal tissue may appear as a tubular structure extending from the right iliac fossa or retrocecal region to the cecum[10,11]. Abdominal CE-CT may reveal findings such as inflammation in the pericecal region, abscesses, thickening of the cecum and terminal ileum, and free fluid in the pericecal and paracolic areas[9,12]. In some cases, the appendiceal base may be inflamed, while in others, fecaliths may develop[13]. Timely diagnosis is crucial to prevent severe complications such as stump gangrene, perforation, and peritonitis[5]. Although diverticular disease is rare in the proximal colon, cecal diverticulitis should not be overlooked as it can present similarly to appendicitis. Nearly 70% of individuals with cecal diverticulitis undergo surgery following a preoperative diagnosis of acute appendicitis, with only 5.3% of 318 patients accurately diagnosed before surgery[14]. Congenital anomalies, such as duplicate appendices, should also be considered, although a review of past surgical records in our case indicated the presence of only one appendix[15].

Failure to fully expose the appendiceal base during appendectomy can result in residual tissue, potentially leading to stump appendicitis, particularly following laparoscopic procedures[16]. However, stump appendicitis has been reported to occur after both open and laparoscopic appendectomies[3]. According to the literature, an appendiceal stump longer than 5 mm increases the risk of stump appendicitis[17]. Both anatomical and surgical factors contribute to this risk, such as misidentification of the appendiceal base or appendiceal-cecal junction. Anatomical variations, including an accessory appendix, a diverticulum near the base, or an appendix located behind the cecum or beneath the serosa, can also increase the risk[18,19]. Surgical factors include concerns about damaging the cecum, difficulty with dissection, limited ability to identify the appendiceal base due to acute

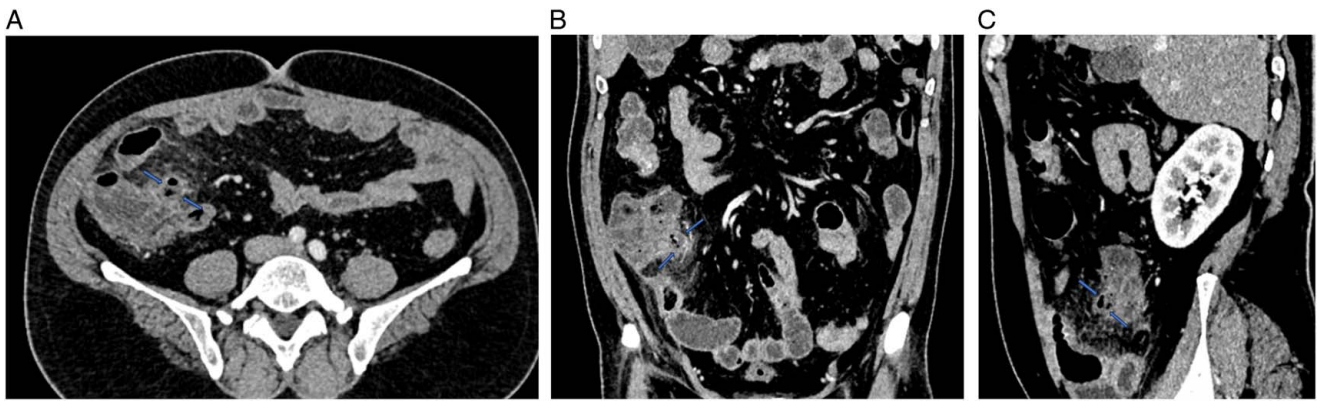

Figure 1. CECT abdomen and pelvis (A: axial view, B: coronal view, and C: sagittal view) showing an outpouching arising from the cecum just anteroinferior to ileocecal junction with marked surrounding fat strandings.

Figure 2. Grossly inflamed stump of appendix measuring ~1 cm with surrounding omentum.

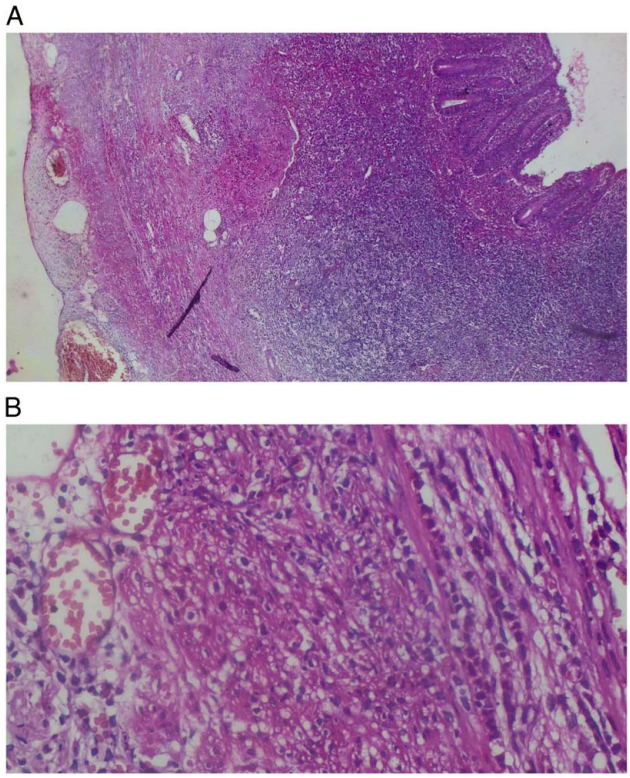

Figure 3. A: Histopathological examination of the excised specimen (Haematoxylin and Eosin (H&E) stain, 50x magnification) reveals the appendix with mucosa, submucosa, muscularis propria, and serosal surface, with neutrophilic infiltration observed in the muscular layer. B: Histopathological examination (H&E stain, 200x magnification) focusing on the presence of neutrophils in the muscular layer of the appendix.

inflammation, and, to some extent, the surgeon's expertise[20]. Proper appendectomy involves exposing the mesoappendix, the tenia coli of the cecum, and the appendiceal-cecal junction, and ligating the recurrent or accessory branch of the appendiceal artery (Seshachalam's artery), regardless of whether the procedure is laparoscopic or open[21].

There is no standardized surgical approach for suspected stump appendicitis, but laparoscopy offers advantages over open surgery due to better visualization for accurate differential diagnosis[22]. It is recommended that the appendiceal stump be less than 0.5 cm in length to reduce the risk of stump appendicitis, and the appendiceal base should be clearly identified[5]. Completion appendectomy, usually performed through open surgery (72%), remains the preferred treatment for stump appendicitis[23]. In cases of significant inflammation and peritonitis, an ileocecostomy may be required[24]. Colonoscopic removal of a fecalith has been suggested as a nonsurgical option for treating stump appendicitis[23]. One way to reduce the likelihood of stump appendicitis is to use stapling devices during both open and laparoscopic appendectomies, which seal the appendiceal base, leaving minimal to no residual tissue[5].

Kumar *et al.*[25] reported a case of suppurative appendicitis discovered during laparoscopic exploration in a patient with a previous history of appendectomy and right lower abdominal pain. Similarly, Manoglu *et al.*[26] described a patient with cecal necrosis secondary to stump appendicitis, who had been referred twice with complaints of abdominal pain. Given the history of appendectomy, classic CT findings, and intraoperative identification of a tubular structure arising from the junction of the tenia coli, we diagnosed stump appendicitis, later confirmed by histopathological examination. In contrast to laparoscopic appendectomy, which is more commonly associated with stump appendicitis, our case followed an open appendectomy. Additionally, there was no evidence of a fecalith or complications such as stump perforation, abscess, or adjacent cecal necrosis.

Conclusion

Although rare, stump appendicitis can occur following an appendectomy. It is essential to consider stump appendicitis when evaluating a patient with sudden abdominal pain and a history of appendectomy, as delayed diagnosis and treatment can increase morbidity and mortality.

Patient's perspective

The patient was satisfied with the treatment and is doing well 3 months after surgery.

Methods

The case has been reported in line with the surgical case report (SCARE) 2023 criteria[27].

Ethical approval

Since this is a case report, our Institutional Review Board Institute of Medicine (IOM) has waived the requirement for ethical approval.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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No funding was done for the case report.

Author contribution

A.B.: conceptualization, manuscript writing, and literature review; A.K.: literature review, editing, and as corresponding author; P.L.: manuscript writing and literature review; B.P. and S.K.C., and S.K.C.: literature review and editing. All authors have read and approved the manuscript.

Conflicts of interest disclosure

The authors declare no conflicts of interest.

Research registration unique identifying number (UIN)

Since it is a case report and not a research study, no clinical trials have been performed.

Guarantor

Aashish Bastakoti and Abhikanta Khatiwada.

Data availability statement

It will be open access and publicly available as per the journal guideline.

Provenance and peer review

Not commissioned.

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