

The Longest Adult Appendix Recorded: A 38-cm Mega-Appendix Presenting with Peri-Appendiceal Phlegmon Mimicking Acute Appendicitis: a case report

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Case Report

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Abstract

Background:

The human vermiform appendix averages under 10 cm in length, with specimens exceeding 20 cm classified as "mega-appendices". We report an extraordinarily rare case of a 38-cm adult appendix, the longest documented in modern medical literature, presenting with severe extra-luminal inflammation and a normal appendiceal mucosa.

Case Presentation:

A 52-year-old woman presented with right lower quadrant pain and an Alvarado score of 9. Imaging and physical exam suggested an appendiceal phlegmon. Surgical exploration revealed a massive, 38-cm-long appendix surrounded by 300 mL of purulent fluid and early necrosis at its base. Following successful appendectomy and debridement, the patient recovered uneventfully. Surprisingly, histopathology of the mucosal lumen was within normal limits, showing that the profound inflammatory process was strictly extra-luminal.

Conclusion:

This case establishes a new anatomical upper limit for adult appendiceal length (38 cm) and highlights a profound clinicopathological mismatch. Extreme appendiceal length may predispose to mechanical traction, kinking, or intermittent torsion, triggering isolated extra-luminal fat necrosis and secondary abscess formation while sparing the mucosa. Severe peri-appendiceal inflammation can clinically and radiologically mimic acute appendicitis even in the absence of intrinsic luminal disease.

Introduction

The vermiform appendix is a narrow, blind-ending tubular structure arising from the cecum. Its average length is 9.5 cm in males and 8.7 cm in females (1). Children and adolescents generally have longer appendices, as appendiceal length gradually decreases with age (2). Appendices measuring more than 20 cm, often referred to as mega-appendix, are exceptional findings in surgical and anatomical literature. The longest appendix recorded by Guinness World Records measured 26 cm, removed from a 72-year-old man (3).

Most reported cases of unusually long appendices involve typical intraluminal acute appendicitis, reflecting the usual mechanism of luminal obstruction and subsequent inflammation (4, 5, 6). In contrast, presentations in which patients show clinical and radiologic features of acute appendicitis, yet the appendix itself demonstrates no intraluminal or mural inflammation, are exceedingly rare.

Extra-luminal inflammatory processes such as peri-appendiceal phlegmon, fat necrosis, or abscess formation without true appendicitis remain poorly described.

We herein present a case of 52-year-old woman with an extraordinarily long appendix measuring 38 cm, making it the longest appendix to be ever recorded for an adult in medical literature, accompanied by a peri-appendiceal abscess and phlegmon, but with histologically normal appendiceal architecture and inflammation confined to the surrounding omentum and peritoneal tissues. This combination of extreme appendiceal length and isolated extra-luminal inflammation represents a rare anatomical and clinical presentation.

Case Report

A 52-year-old woman presented to the emergency department with a two-day history of abdominal pain with anorexia and nausea. She had no known medical conditions, and her surgical history was notable only for a cesarean delivery performed ten years earlier. On clinical examination, she was mildly febrile, with otherwise normal vital signs. Abdominal examination revealed marked tenderness in the right lower quadrant, with a positive McBurney's sign.

Laboratory investigations indicated an inflammatory process, with a white blood cell count of 14,700 and neutrophils at 81%.

Abdominal ultrasound demonstrated a non-compressible, non-peristaltic intestinal loop in the right iliac fossa, with wall edema measuring 1.6 cm. The distal portion of this structure was markedly dilated, reaching approximately 2.5 cm in diameter. Surrounding the loop, there was turbid fluid collection consistent with an abscess, along with reactive omental changes, findings highly suggestive of a peri-appendiceal phlegmon. A small amount of free fluid was also noted in the pelvis between bowel loops.

Abdominal CT imaging confirmed these findings, showing a grossly dilated, thick-walled blind-ending tubular structure consistent with the appendix, surrounded by marked inflammatory changes, fat stranding, and localized abscess formation. A small volume of reactive free fluid was also present in the pelvis.

The patient subsequently underwent surgical exploration through a McBurney incision. The abdominal wall layers were opened systematically. Upon entering the peritoneal cavity, approximately 300 ml of thick purulent fluid was encountered and evacuated and abscess cavity was fully decompressed (Fig. 1). Examination revealed marked thickening of the mesentery and intense inflammatory changes surrounding the appendix. The appendix was carefully isolated, early necrosis was identified near its base and it was found to be extraordinarily long, measuring approximately 38 cm (Figs. 2, 3). The base was dissected, ligated, and the appendix was removed (Fig. 4). A drain was placed in the abscess cavity, followed by thorough irrigation of the operative field and standard layered closure of the incision.

The patient was discharged 48 hours after surgery in good general condition. The drain was removed on postoperative day 5, and skin sutures were removed on day 14. Follow-up at one month was uneventful, with normal clinical examination and laboratory results.

The patient expressed satisfaction and relief with the prompt surgical outcome and the uneventful recovery.

Pathology Findings:

The appendectomy specimen was measured uncompressed on the operative table immediately following resection, prior to formalin fixation 38 x 0.5 cm, confirming the unusually long appendix observed intraoperatively. The accompanying omental tissue measured 12 x 7.5 x 1.5 cm, and the mesenteric sample measured 10.5 x 6 x 1.5 cm.

Microscopic evaluation of the appendix was within normal limits, with no signs of active inflammation, ulceration, or granuloma formation. The omental and peritoneal samples demonstrated fat necrosis with heavy acute inflammatory infiltrate, consistent with the peri-appendiceal abscess noted intraoperatively. No epithelioid granulomas were identified. The mesenteric tissue was within normal limits except for congested blood vessels.

These findings indicate that the inflammatory process was extra-luminal, centered in the peri-appendiceal tissues and omentum, while the appendix itself showed no active appendicitis.

Discussion

Anatomical variations of the vermiform appendix are frequently encountered regarding its positional orientation, but extreme deviations in longitudinal growth remain exceptionally rare (7). While the average adult appendix measures under 10 cm (1), specimens exceeding 20 cm are classified as “mega-appendices.” The historical benchmark established by Guinness World Records describes a 26 cm appendix (3). Although isolated pediatric cases have reported extreme lengths up to 55 cm (8), a verified intraoperative and pathological measurement of 38 cm in an adult places this case at the uppermost limit of documented human anatomy.

Beyond its unprecedented length, the defining feature of this case is the marked clinicopathological mismatch. The patient presented with classic symptoms of acute appendicitis, an Alvarado Score of 9, a peri-appendiceal phlegmon, a 300 ml purulent abscess, and early necrosis near the appendiceal base. Despite these findings, histopathology revealed a completely normal appendiceal mucosa with no ulceration, neutrophilic infiltration, or mural necrosis. Inflammation was instead confined to the surrounding omentum and peritoneal tissues, manifesting as fat necrosis, abscess formation, and phlegmon, consistent with extra-luminal inflammation.

A plausible mechanism involves mechanical factors related to extreme appendiceal length. A 38 cm appendix is predisposed to kinking, traction, intermittent torsion, or friction against adjacent structures. Such mechanical stress may compromise local blood flow or irritate the omentum, leading to fat necrosis and secondary abscess formation. In this scenario, the appendix functions less as the primary site of inflammation and more as an anatomical trigger for peri-appendiceal pathology.

This case highlights that severe peri-appendiceal inflammation can closely mimic acute appendicitis clinically and radiologically, even when the appendix itself is histologically normal. Recognition of this rare presentation is important, as it broadens the differential diagnosis of right-lower-quadrant inflammatory processes and underscores the value of correlating operative findings with definitive histopathology.

Declarations

Clinical trial number: not applicable.

Ethics approval and consent to participate:

Not applicable.

Consent for publication:

Written informed consent was obtained from the patient for publication of this Case report and any accompanying images.

Availability of data and materials:

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests:

The authors declare that they have no competing interests.

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Figures



Figure 1

McBurney incision. The abdominal wall layers were opened and upon entering the peritoneal cavity, approximately 300 ml of thick purulent fluid was encountered.



Figure 2

The appendix was carefully isolated, early necrosis was identified near its base and it was found to be extraordinarily long, measuring approximately 38 cm.



Figure 3

The appendix was carefully isolated, early necrosis was identified near its base and it was found to be extraordinarily long, measuring approximately 38 cm.



Figure 4

The appendix held with forceps by the surgeon.