

Trapped and Torn: A Rare Case of Perforated Appendicitis in an Incisional HerniaMaj. Vinay Kumar Sah¹, Arunima Verma², Praneet Prasad³, Adya Dutta⁴¹Senior Consultant, Department of General Surgery, Tata Motors Hospital, Jamshedpur, Jharkhand, India.²HOD, Department of Surgery & Chief Medical Superintendent, Tata Motors Hospital, Jamshedpur, Jharkhand, India.³Post Graduate Trainee 3rd Year, Department of General Surgery, Tata Motors Hospital, Jamshedpur, Jharkhand, India.⁴Post Graduate Trainee 2nd year, Department of General Surgery, Tata Motors Hospital, Jamshedpur, Jharkhand, India.

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Abstract:

Background: Incisional hernias occur in 10–15% of post-laparotomy patients and most commonly follow caesarean sections. While incarceration and strangulation are well recognized, appendicitis within an incisional hernia is exceptionally rare, with fewer than 20 cases reported world-wide and only a handful describing perforation. This rarity creates diagnostic challenges; displaced anatomy and surrounding edema can mask appendiceal inflammation on imaging, leading to misinterpretation and delayed diagnosis.

Case Presentation: A 45-year-old female with prior classical caesarean section presented with a 2-day history of a painful, tender, irreducible midline scar swelling with local erythema and mild tachycardia with relatively soft rest of the abdomen. CT was reported as an incarcerated incisional hernia containing bowel and omentum; appendiceal inflammation was not identified. Open exploration revealed a perforated appendix within the hernia sac with purulent exudate and necrotic omentum. Appendectomy was performed and the fascial defect closed primarily using PDS sutures; no mesh was placed due to contamination. Postoperative treatment included Piperacillin–Tazobactam for 72 hours, early mobilization, and discharge on postoperative day 5. At three-month follow-up, the wound had healed and there was no recurrence.

Conclusions: Appendicitis within an incisional hernia is a diagnostic trap that may evade detection on imaging because of altered anatomy. Clinicians should keep a high index of suspicion for appendiceal pathology in irreducible or inflamed hernias even when CT is non-diagnostic. Open exploration is both diagnostic and therapeutic in uncertain cases. In contaminated fields primary fascial repair is preferred, and mesh should be avoided or delayed. Early recognition and prompt surgical management result in favourable outcomes.

Keywords: Incisional hernia; appendicitis; perforated appendix; incarcerated hernia; CT diagnostic pitfall; appendectomy; primary fascial repair; contaminated hernia.

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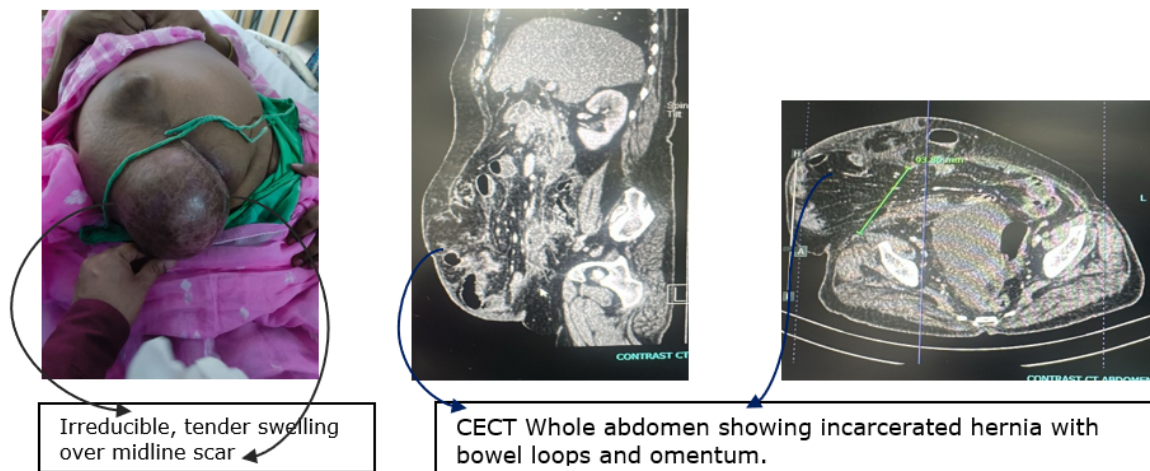
Introduction

Incisional hernia is a common complication after abdominal surgery and remains an important cause of morbidity following laparotomy.[1] [4] The sac usually contains omentum or small bowel, whereas the appendix is only rarely encountered within a ventral or incisional hernia.[1] [5] [8] When appendicitis occurs within a hernia sac, the presentation is often atypical because pain is localized to the hernia rather than the right iliac fossa, which can delay recognition and create diagnostic confusion with incarceration or strangulation. [1] [4] [8]

Incisional hernia develops in 10–15% of patients following laparotomy, while the incidence of incisional hernia specifically after caesarean section ranges from 0.2% to 1.0% [1][3]. Appendix involvement in hernia is uncommon (<0.1% of hernia cases), and perforated appendix within an incisional hernia is exceedingly rare, with an estimated occurrence of ~0.008% among all incisional hernia cases [4][5]. Although appendicitis more frequently complicates inguinal, femoral, and umbilical hernia, its occurrence in incisional hernia is exceptionally rare and therefore noteworthy when encountered in clinical practice.

Case presentation: A 45-year- old woman presented to the surgical service with a 2- day history of painful swelling over a previous lower midline scar following classical caesarean section. The swelling had become progressively painful and irreducible. There was no history suggestive of classical right

lower quadrant pain migration. On examination, an irreducible and tender swelling was noted over the scar site with local erythema and induration. The patient was mildly tachycardic but afebrile, and there were no definite signs of generalized peritonitis.

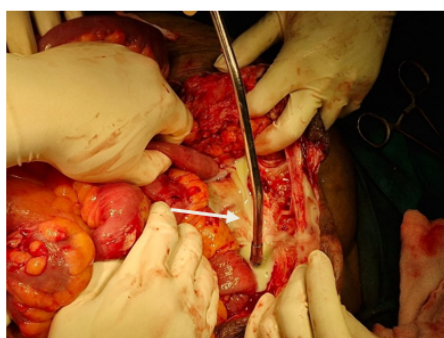


Irreducible, tender swelling over midline scar

CECT Whole abdomen showing incarcerated hernia with bowel loops and omentum.

Contrast- enhanced computed tomography was interpreted as showing an incarcerated incisional hernia containing bowel loops and omentum. No definitive preoperative diagnosis of appendicitis was made. The likely reason for this radiologic miss was the abnormal location of the appendix within the hernia sac and the obscuring effect of surrounding oedema and inflamed tissues, a limitation that has been described in atypical hernia- associated appendicitis.[1] [4] Also Computed tomography sensitivity for appendicitis drops significantly in hernia-related contexts, from typical 95% to approximately 70%. Altered appendiceal position and surrounding inflammatory changes reduce diagnostic accuracy.[4]

In view of the painful irreducible hernia and concern for incarceration, emergency surgery was undertaken. Through a midline approach, the hernia sac was opened and incarcerated contents were identified within the fascial defect. Intraoperatively, a perforated appendix was found within the sac, associated with purulent exudate and adherent necrotic omentum. Appendectomy was performed, the contaminated contents were dealt with appropriately, and the fascial defect was repaired primarily using PDS sutures. Prosthetic mesh was not used because contamination increases the risk of mesh infection and postoperative septic complications. [1] [4] [8]



Intra-operative finding: purulent exudate and necrotic omentum



Intra-operative finding: perforated appendix



Fascial defect repaired using PDS

Postoperative course: The patient received piperacillin- tazobactam for 72 hours postoperatively. Early ambulation was initiated on postoperative day 1. Recovery was uneventful, and the patient was dis-

charged on postoperative day 5. At 3-month follow-up, wound healing was satisfactory and there was no clinical evidence of recurrence.



Post-op Week 1



Post-op Week 2



Post-op Week 3

Discussion

The present case illustrates a rare variant of abdominal wall hernia pathology in which the appendix becomes trapped within an incisional hernia and subsequently progresses to perforation.[6] [7] [8] Although appendicitis in external hernias is itself uncommon, most published cases involve inguinal, femoral, or other ventral hernias rather than postoperative incisional defects.[1] [4] [5] This rarity explains why the diagnosis is often not considered before surgery.[1] [8]

The mechanism by which appendicitis develops in a hernia sac has not been fully established, but proposed explanations include extraluminal compression at the neck of the hernia, repeated trauma, compromised blood supply, and impaired drainage due to incarceration. [1] [4] [8] Once trapped in a confined space, the appendix may undergo inflammation, ischemia, bacterial overgrowth, and perforation. In this setting, the inflammatory process may remain localized to the hernia sac rather than producing the classic clinic radiologic pattern of acute appendicitis in the right iliac fossa.[1] [4]

Previous cases of Appendix within Incisional Hernia are given in the table below.

No	Authors	Previous Operation	Location of the Hernia	Type of Performed Operation	Normal or Altered Appendix
1	Erol T. et al.	NA	NA	NA	Inflamed
2	Paudyal N. et al.	Laparotomy with right-sided salpingectomy	Pfannenstiell incision	Open surgery	Inflamed
3	Lakhani DA. et al.	Left total nephrectomy and renal transplantation	Right lower quadrant incisional hernia	Open surgery	Perforated
4	Molina G. et al.	Open cholecystectomy	Kocher incision	Open surgery	Inflamed
5	Lam A. et al.	Laparoscopic sterilization	Umbilical laparoscopic port site incision	Open surgery	Inflamed
6	Kler A. et al.	Open total hysterectomy	Pfannenstiell incision	Open surgery	Normal
7	West C. et al.	Open abdominal aortic aneurysm repair	Laparotomy incision	Open surgery	Perforated
8	Sugrue C. et al.	Open cholecystectomy	Upper midline incisional hernia	Open surgery	Inflamed
9	Sugrue C. et al.	Diagnostic laparoscopy and lavage	Five mm port site in the right iliac fossa	Open surgery	Inflamed
10	Galiñanes EL. et al.	Total abdominal hysterectomy with right-sided oophorectomy	Pfannenstiell incision	Laparoscopic surgery	Inflamed
11	Dittmar Y. et al.	Kidney transplantation	Right lower quadrant incisional hernia	Laparoscopic surgery	Inflamed
12	Singal R. et al.	Open surgery of subsequent bone grafting from the right iliac crest	Previous operation incision	Open surgery	Inflamed
13	Menenakos Ch. et al.	Laparoscopic low anterior rectal resection	Twelve mm trocar site incision in the right iliac fossa	Open surgery	Inflamed

Diagnosis before surgery remains difficult. Clinical findings frequently favor incarcerated or strangulated hernia, especially when the swelling is painful, irreducible, and associated with overlying skin changes.[1] [8] Cross-sectional imaging can improve diagnostic accuracy, but even CT may fail to identify the appendix when the anatomy is distorted or inflammation obscures the organ, as occurred in this case.[1] [2] Therefore, imaging should support but not replace clinical judgment in the management of symptomatic irreducible incisional hernias.[4] [8].

The operative strategy in such cases should address both the inflamed appendix and the abdominal wall defect. Appendectomy is generally recommended when an inflamed or perforated appendix is encountered in the hernia sac.[1] [4] [8] Hernia repair must then be tailored to the degree of contamination. In clean fields, prosthetic reinforcement may be considered, but in the presence of pus, necrotic tissue, or perforation, most reports favor primary tissue repair and avoidance of mesh because of the elevated risk of mesh infection. [1] [4] [5] The management adopted in the present patient was therefore consistent with current case-based practice.[3] [7]

Published literature remains limited mainly to case reports and small reviews, so broad conclusions cannot be drawn. Nevertheless, the available evidence consistently suggests three practical messages: first, atypical appendicitis should be considered in painful irreducible scar hernias; second, negative or non-specific imaging does not exclude significant pathology within a hernia sac; and third, prompt exploration can be both diagnostic and curative.[1] [4] [8]

Conclusion

Perforated appendicitis within an incisional hernia is an exceptionally rare surgical presentation that may masquerade as a routine incarcerated scar hernia.[6] [7] [8] The absence of classical right lower quadrant findings and the possibility of inconclusive imaging make preoperative diagnosis difficult.[1] [4] Surgeons should maintain a high index of suspicion in patients with painful, irreducible incisional hernias, and should be prepared to perform appendectomy with primary hernia repair when contamination is present.[1] [4] [8]

The main clinical implication is that atypical localized pain over a previous abdominal scar should not be assumed to represent simple incarceration alone, particularly when tenderness is disproportionate or imaging is non-specific. [1] [4] From a surgical standpoint, timely exploration remains the safest strategy in symptomatic irreducible hernias because delay may permit perforation, localized sepsis, and avoidable morbidity. Intraoperatively, careful inspection of all sac contents is essential, and in the presence of contamination or perforation, appendectomy with primary tissue repair is more appropriate

than prosthetic mesh placement because of infection risk. [1] [3] [6]

Key surgical learning points

- Consider appendicitis in the differential diagnosis of painful, irreducible incisional hernias, even when classical right iliac fossa signs are absent. [1] [4]
- Do not rely solely on CT findings when clinical suspicion remains high, because distorted anatomy may obscure appendiceal pathology within the hernia sac. [1] [4]
- Urgent operative exploration is both diagnostic and therapeutic in atypical, incarcerated hernias with evolving local inflammatory signs.[2] [4]
- Avoid mesh in contaminated fields; primary fascial closure is the safer option when perforation, pus, or necrotic tissue is present. [3] [6]

Patient consent: Written informed consent was obtained from the patient for publication of this case report and any accompanying clinical details and images.

Declarations

Conflict of interest: None declared.

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Ethical approval: Not required for a single case report in our institute.

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