Case Report



# A rare case report of an appendiceal abscess with a pneumatocele and direct extension into an anterior abdominal wall abscess

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**Abstract:** Acute appendicitis, while exceedingly common carries a wide range of clinically variable presentations. We present a case of a perforated appendicitis manifesting clinically as an anterior abdominal wall abscess and its subsequent management. There have been eight documented case reports to date of direct extension into the anterior abdominal wall, in contrast to the commonly documented retroperitoneal perforation. The management of this condition has varied in the published reports from intravenous antibiotics to surgical debridement of the abdominal wall. The aetiology of the direct extension into the abdominal wall remains nebulous. In our patient it was felt that the appendicolith could be a contributing factor for perforation through the abdominal wall. Our patient was initially managed with intravenous antibiotics and percutaneous abscess drainage, followed by an interval laparoscopic appendectomy three weeks later. The patient's age and her dementia precluded conservative management of the appendix post percutaneous abscess drainage, as an elective appendectomy is no longer the standard of care. A colonoscopy performed three months later also excluded a colonic malignancy. We believe this is the first documented case of an abdominal wall pneumatocele which formed as part of the abdominal wall abscess. It is our fervent desire that this case report contributes to the surgical armamentarium of acute care surgeons in the management of this complex condition.

**Keywords:** Appendix abscess; anterior abdominal wall abscess; case report; percutaneous abscess drainage; laparoscopic appendectomy

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## Introduction

Acute appendicitis is a common surgical condition with a lifetime risk of 7–8% (1). It remains the most common indication for emergency surgery (2) and is managed laparoscopically with low morbidity and mortality. The clinical presentation ranges from acute inflammation to abscess and perforation. There are reports of perforation into the retroperitoneum causing abscesses of the psoas muscle, right perinephric space, lumbar triangles, groin and thigh (3,4).

Perforation associated with an Amyand hernia has been documented in the literature (5), as well as an abdominal wall abscess leading to an enterocutaneous fistula (6-9). On rare occasions, these infections have caused necrotizing fasciitis of the abdominal wall musculature (10-14). The surgical management has varied and has included percutaneous drainage with an interval appendectomy, laparoscopic appendectomy, or a laparotomy and surgical debridement of the infected area. We present a case of perforated appendicitis manifesting as an anterior abdominal wall abscess. This

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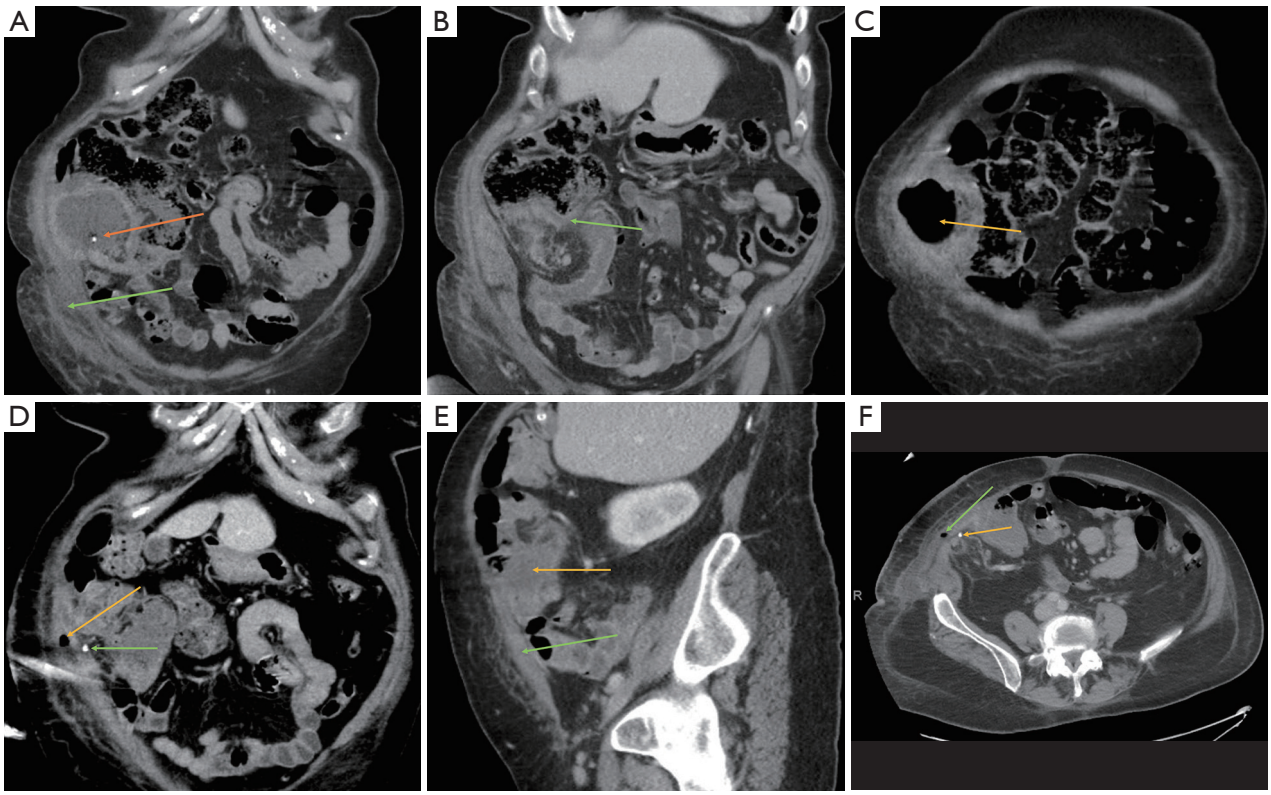


**Figure 1** Radiology images. (A) CT scan coronal view showing the intra-abdominal abscess, with an appendicolith (orange arrow) *in situ* and abscess extension into the anterior abdominal wall (green arrow). (B) CT scan coronal view showing the inflamed appendix (green arrow). (C) Abdominal wall pneumatocele (orange arrow) formed as part of the abdominal wall abscess extension on the CT scan coronal view. (D) Coronal view post percutaneous abscess drainage with the appendicolith (green arrow) *in situ* and reduction of the abdominal wall pneumatocele (orange arrow). (E) CT scan sagittal view showing the abdominal abscess (orange arrow) and inflammation of the Transversalis muscle (green arrow) on the right. (F) CT scan axial view post percutaneous abscess drainage with the appendicolith (orange arrow) *in situ* and reduced abdominal wall pneumatocele (green arrow). CT, computerized tomography.

was initially managed with intravenous antibiotics and a percutaneous drain, followed by an interval appendectomy. There have been eight published reports in the English literature of an appendix abscess with direct extension onto the anterior abdominal wall (6-13). The majority of published reports to date have documented a retroperitoneal appendix perforation. The abdominal wall abscess forms through a lateral extension of the pus that tracks on to the anterior abdominal wall. We present the following case in accordance with the CARE reporting checklist (available at https://ls.amegroups.com/article/view/10.21037/ls-21-14/rc).

## Case presentation

A 77-year-old woman presented to the acute care surgical team with abdominal pain, nausea and vomiting. She was clinically stable with no signs of pyrexia, chills or rigors. Abdominal examination revealed a swelling over her right iliac fossa. The swelling was fluctuant and the margins poorly defined, with no signs of surgical crepitus. There were clinical signs of rebound tenderness and guarding. Significant laboratory investigations included a leukocytosis and an increased C-reactive protein. Her medical history was significant for dementia and she resided in a care home. She had no previous abdominal surgery. A computerized tomography (CT) scan showed an intra-abdominal abscess with extension into the right anterior abdominal wall (*Figure 1A*). It originated from an acutely inflamed ruptured appendix with an appendicolith *in situ* (*Figure 1B-1D*). Medical treatment was initiated with intravenous antibiotics and opiate analgesia. Antibiotics included a third-generation cephalosporin (ceftriaxone)

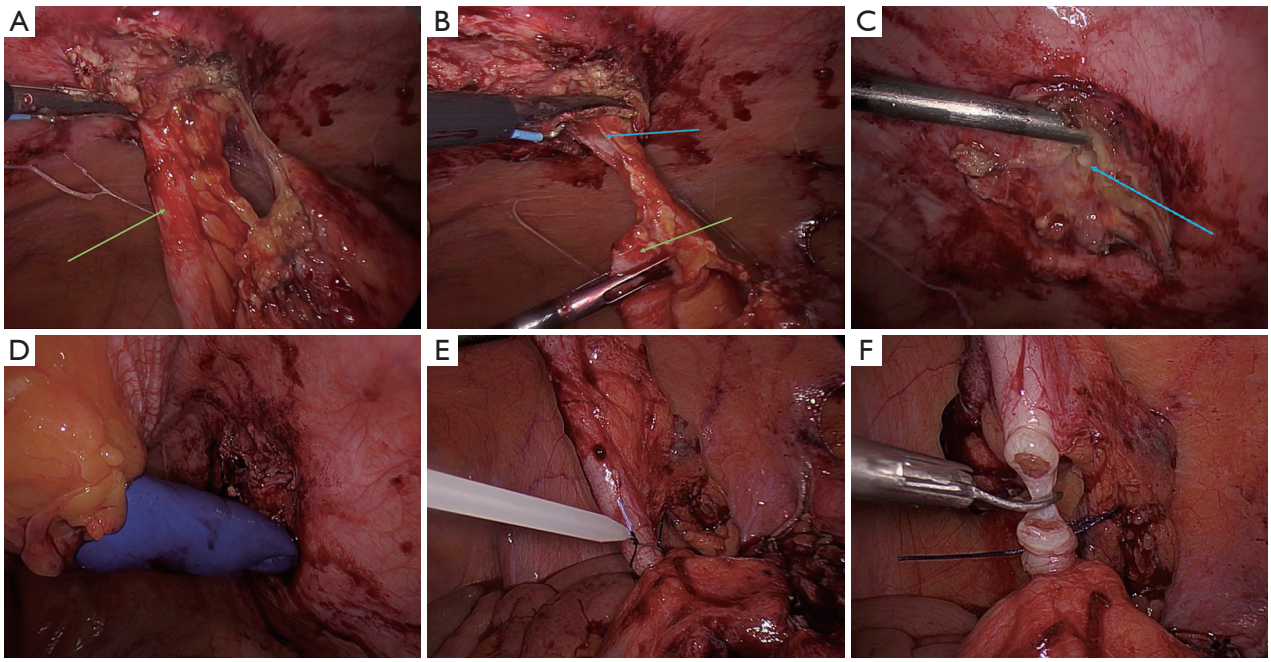


**Figure 2** Surgery pics. (A) Laparoscopic visualisation of the appendix (green arrow) adherent to the anterior abdominal wall. (B) Mobilisation of the proximal appendix (green arrow) with the ruptured distal end (blue arrow) attached to the anterior abdominal wall. (C) Appendicolith (blue arrow) adherent to the abdominal wall. (D) Digital examination of the abdominal wall cavity, through the infra-umbilical port site to ensure no appendix remnant or appendicolith is left behind. (E) Appendix base secured with an Endoloop© (Ethicon, USA) suture. (F) Incision of the appendix base post suture ligation.

and metronidazole. The patient was subsequently discussed with an interventional radiologist. A percutaneous abdominal drain was inserted and 100 milliliters of purulent fluid drained. Culture and sensitivity grew a multitude of organisms. The drain was accidentally removed after three days and a repeat CT scan showed complete resolution of the abscess including the anterior abdominal wall component (*Figure 1E,1F*). The patient made an uneventful recovery and was discharged home on a course of oral antibiotics that included a second-generation cephalosporin (cephazolin) and metronidazole. Three weeks later during routine follow-up, the patient had physiologically improved with a clinically soft abdomen and no palpable masses. She had no fever, chills or rigors since her discharge. After an extensive discussion with the patient and her family, she signed an informed consent for an elective laparoscopic appendectomy. At laparoscopy, the caecum and appendix were adherent to the anterior abdominal wall. Mobilization of the caecum showed the appendix entering into an abdominal wall defect. This was thought to be the source of the previous abdominal wall abscess (*Figure 2A,2B*). The appendicolith was still *in situ* and adherent to the anterior abdominal wall (*Figure 2C*). The appendix was mobilized and a standard laparoscopic appendectomy performed (*Figure 2D-2F*). The patient made an uneventful recovery and was discharged home after three days. Pathology confirmed an appendicitis with no features of malignancy. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). 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 editorial office of this journal.

## Discussion

While acute appendicitis remains a common surgical presentation, the atypical presentation of an appendiceal abscess can pose a challenge in diagnosis and appropriate surgical intervention. Perforation can occur in up to

30% of patients with acute appendicitis (15) and carries an increased risk of morbidity and mortality (16). CT is helpful in identifying the etiology and extent of the abdominal wall abscess. It's superior sensitivity and specificity to ultrasound or MRI (17) is useful in planning appropriate therapy in the setting of organ perforation. Percutaneous abscess drainage is well-established as a safe, effective option in clinically stable patients (18,19). Initial conservative management followed by an interval appendectomy avoids the increased risk of perioperative complications associated with surgery in an inflamed surgical field (18,20). This can reduce the overall length of the hospital stay, thereby decreasing the financial burden to the patient and the healthcare system (20). The role of an interval appendectomy has been widely discussed and advocated for in certain patient populations due to the increased risk of recurrence, associated malignancy or inflammatory bowel disease (18). In our case, controversy arose as to whether our patient needed an interval appendectomy, as she had made a complete physiologic recovery to her acute pathological condition. Interval appendectomy is no longer performed routinely after an episode of acute organ infection (20).

After an extensive discussion with her family, it was decided to proceed with surgery. Her dementia precluded her ability to be a good historian and her age increased the risk of an appendicular or colonic malignancy. The presence of an appendicolith also contributed to the surgical algorithm as a possible nidus for a recurrent abscess (*Figure 2C*). She will also undergo an elective colonoscopy as part of her colonic surveillance for malignancy given the association between appendicitis and colonic malignancy in elderly patients. This case is unusual as the abdominal wall abscess was formed via a direct anterior route through the anterior abdominal wall. Most published case reports of an abdominal wall abscess involving a ruptured appendix have demonstrated a retroperitoneal abscess with tracking of the pus laterally onto the anterior abdominal wall. The etiology for direct extension of the abscess remains nebulous. It is thought that the appendicolith could have been a contributing factor through erosion of the posterior sheath of the abdominal wall, in addition to the anterior position of the appendix. A unique feature of this case is the presence of a large abdominal wall pneumatocele (*Figure 1C*,*1E*,*1F*). This is a unique presentation and we believe the first time it has been documented.

## Conclusions

This case report illustrates an atypical presentation of perforated appendicitis in a patient with an anterior abdominal wall abscess and pneumatocele. It was successfully managed with intravenous antibiotics, percutaneous abscess drainage and an interval appendectomy.

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## Footnote

*Reporting Checklist:* The authors have completed the CARE reporting checklist. Available at https://ls.amegroups.com/article/view/10.21037/ls-21-14/rc

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*Conflicts of Interest:* Both authors have completed the ICMJE uniform disclosure form (available at https://ls.amegroups.com/article/view/10.21037/ls-21-14/coif). The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). 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 editorial office of this journal.

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