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A Scholarly Review and Case Study of Scrotal Abscess Resulting from Perforated Appendicitis

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Abtract

Introduction and importance: Scrotal abscesses are uncommon, and their association with a perforated appendix is even rarer. We present a case report detailing a rare occurrence of a left scrotal abscess as a complication following a perforated appendix.

Case presentation: An 11-year-old boy presented with a 24-hour history of severe right lower abdominal pain, fever, and multiple episodes of non-bilious vomiting. The physical examination showed tenderness and guarding over McBurney's point. An abdominal and pelvic computerized tomography (CT) scan, without contrast, suggested a perforated appendix with early inflammatory mass formation. The patient underwent laparoscopic appendectomy under general anesthesia. On the third postoperative day, he developed painful swelling in the left hemiscrotum with fever. He was evaluated twice by scrotal Doppler ultrasound and found to have a left scrotal abscess which was not resolved by conservative medical treatment. On the fifth postoperative day, the abscess was drained by an incision, and a drain was inserted.

Clinical discussion: While intra-abdominal abscess is a well-recognized complication of perforated appendicitis, scrotal abscess is less commonly documented. In our case, despite the absence of an identifiable patent processus vaginalis (PPV), an abscess developed in the left hemiscrotum.

Conclusion: Scrotal abscess formation following appendectomy is an infrequently reported occurrence. Therefore, any post-appendectomy scrotal pain and swelling, irrespective of the side affected, requires evaluation to exclude the possibility of an intra-scrotal abscess.

Keywords: Acute appendicitis; Scrotal abscess; Hemiscrotum; Patent processus vaginalis; Case report

Abbreviations: CT: Computerized Tomography; PPV: Patent Processus Vaginalis

Introduction

Acute appendicitis is one of the most common surgical emergencies in children, with perforation occurring in approximately 20-30% of cases. [1,2] Perforated appendicitis is associated with a higher risk of complications, including intra-abdominal abscess formation, peritonitis, and prolonged hospitalization. Prompt recognition and timely surgical intervention are crucial in preventing these complications and improving patient outcomes. [3,4]

Around week 9 of gestation, the testes initially form within the abdominal cavity before descending into the scrotum through the processus vaginalis, which remains open as a channel between the peritoneum and the scrotum until closure. It's noted that a patent processus vaginalis (PPV) is prevalent in newborn males (80-95%), this prevalence starts decreasing to 60% at 1 year of age, then to 40% at 2 years of age, and in15-37% of male, it persists until adulthood. [5] While abscess formation typically occurs intra-abdominally as a complication of perforated appendicitis, rare instances involve scrotal abscess, particularly in cases where a PPV is present, enabling the flow of intraperitoneal pus into the scrotum via the inguinal canal. [6,7]

Case Report

An 11-year-old boy presented to the emergency department of Al Ahli Hospital with a 24-hour history of severe right lower abdominal pain, fever (38.5°C), and multiple episodes of non-bilious vomiting. The patient had no previous medical or surgical history. His family history did not reveal any relevant diseases. On physical examination, the patient was found to be febrile with tenderness and guarding over McBurney's point. There were no palpable masses or any other findings. Other systems examinations were unremarkable. Laboratory studies revealed leukocytosis with a white blood cell count of 14,300 cells/mm^3 and elevated C-reactive protein levels 86.

An abdominal and pelvic computerized tomography (CT) scan, without contrast showed a markedly dilated Appendix of

13mm in diameter, fluid-filled with appendicolith inside it (Figure 1) and severe stranding around it. (Figure 2) There was a mild to moderate amount of free fluid in the pelvis and right paracolic gutter, suggesting a perforated appendix with early inflammatory mass formation. (Figure 3)

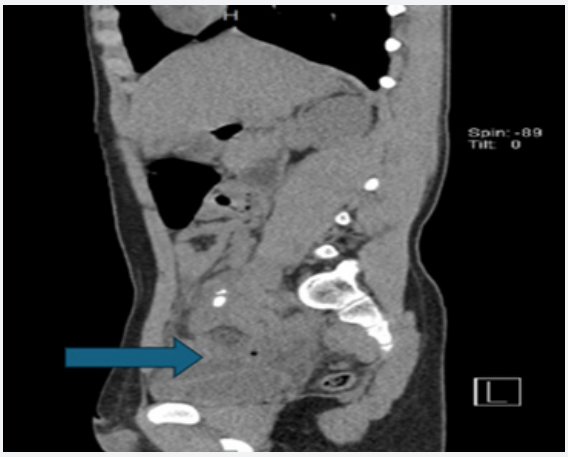

Figure 1: (CT) Scan, without contrast showed a markedly dilated Appendix of 13 mm in diameter, fluid-filled with appendicolith inside it.

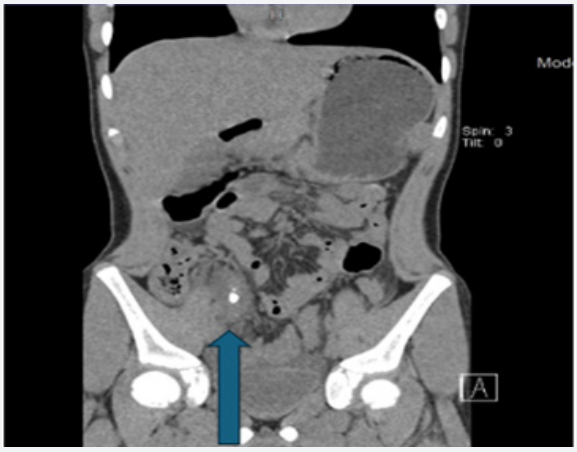

Figure 2: Dilated Appendix with severe stranding around it.

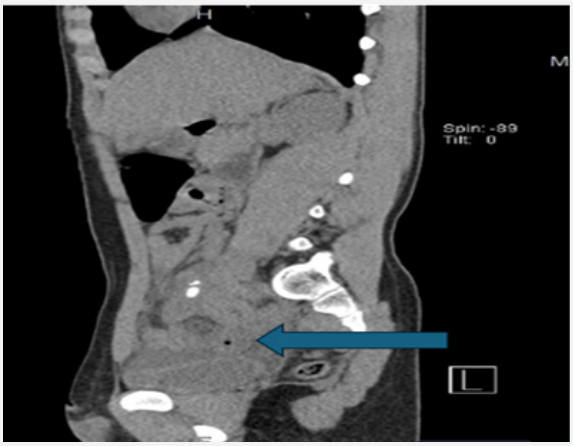

Figure 3: Dilated Appendix, fluid-filled with appendicolith inside it and severe stranding around it. suggesting a perforated appendix with early inflammatory mass formation.

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The patient was admitted to the surgical department and started on a course of intravenous antibiotics (Meropenem and Metronidazole). Given the clinical and radiographic findings consistent with acute appendicitis, the patient was taken to the operating room and underwent laparoscopic appendectomy under general anesthesia. Intraoperatively, the appendix was found perforated (Figure 4) with moderate amount of purulent free fluid in the peritoneal cavity (Figure 5) The appendix was successfully removed, and peritoneal lavage was performed properly. Drain was inserted in the peritoneal cavity, and positioning of the drain was adjusted to be in the pelvis reaching the right iliac fossa.

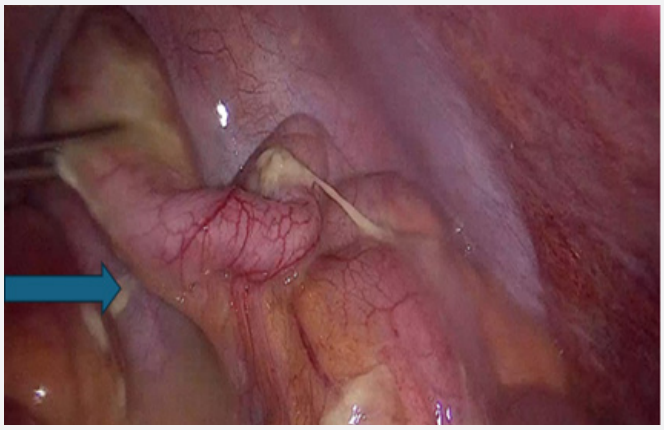

Figure 4: Intraoperatively images of the perforated Appendix.

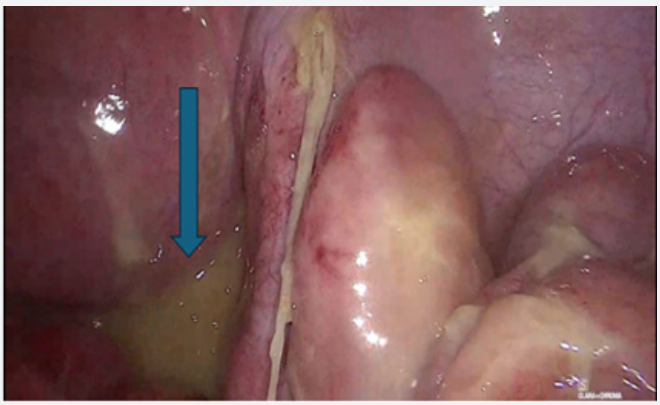

Figure 5: Intraoperatively moderate amount of purulent free fluid in the peritoneal cavity.

The course of intravenous antibiotics was continued in the first two postoperative days, and the patient was monitored closely. He showed gradual improvement of the abdominal symptoms and tolerated well the oral intake. Laboratory studies demonstrated a downward trend in inflammatory markers. On the third postoperative day, the patient developed painful swelling on his left scrotum with fever (up to 38.8°C). Clinical examination showed redness and mild swelling of the left hemiscrotum, which was mildly tender on palpation. the left testis was palpable with normal consistency.

Scrotal Doppler ultrasound showed a large fluid collection around the left epididymis and testis measuring 4.8 x 1.8cm with low-level internal echoes within. The Patient was evaluated by the urology team and the recommendation was to continue the intravenous antibiotic course, with close observation and regular monitoring of the clinical symptoms and signs. On the fifth postoperative day, the swelling increased and extended toward the left inguinal canal, with increased redness and tenderness over the left hemiscrotum. Doppler ultrasound was performed again and showed a marked increased amount of the left scrotal fluid collection that measured 4.5 x 3.2cm with multiple septations and echogenic debris, (Figure 6) the radiological features were in line with the infected fluid collection and abscess formation. The collection was seen trickling through the patulous inguinal canal into the abdomen cavity. The left testis was found displaced with significantly increased vascularity of the testis (Figure 7) and epididymis (epididymo-orchitis) (Figure 8)

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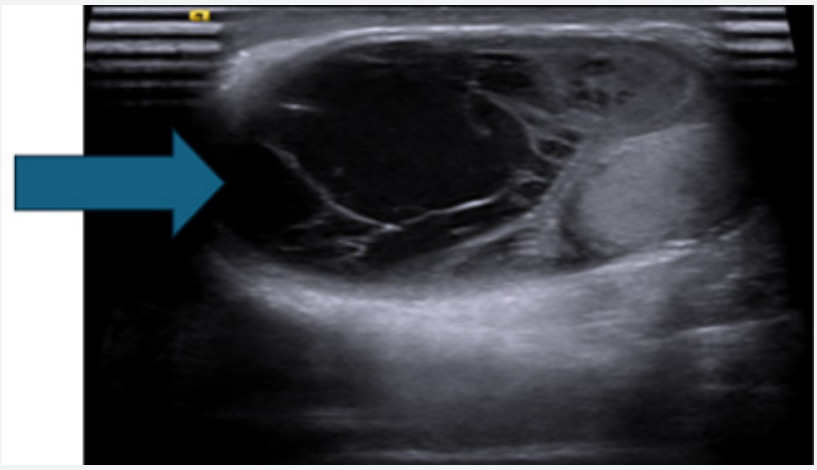

Figure 6: U/S Doppler increased amount of the left scrotal fluid collection with multiple septations and echogenic debris.

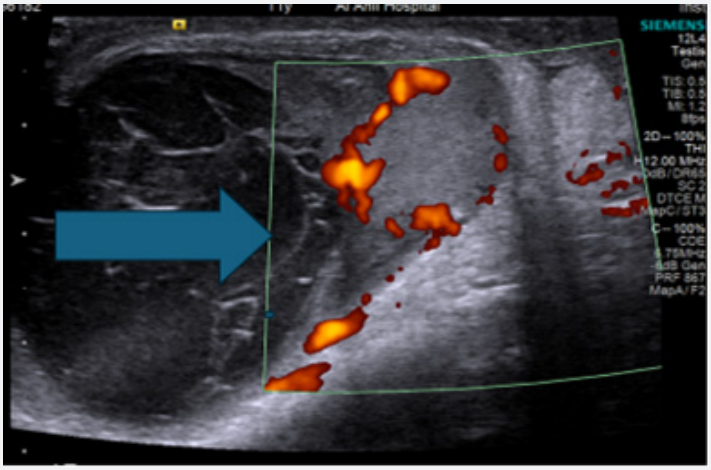

Figure 7: U/S Doppler significantly increased vascularity of the testis.

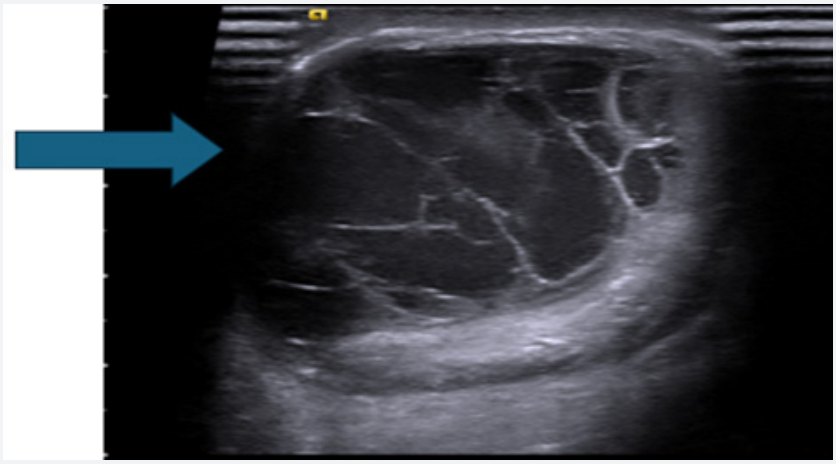

Figure 8: U/S Doppler epididymo-orchitis.

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The decision for left scrotal exploration was made, and the patient underwent incision and drainage of the left scrotal abscess under general anesthesia. The operation was performed through an incision in the left anterior scrotal wall. The dartos fascia was divided, the left testicle was delivered, Tunica was opened, and then a large amount of turbid fluid/pus was drained. Penrose drain was inserted in the most dependent part of the scrotum.

Postoperatively, the course of intravenous antibiotics was continued, and the patient was monitored closely. He showed gradual improvement clinically and tolerated well the oral intake. Laboratory studies demonstrated a downward trend in the inflammatory markers again. The fever settled and the pain relieved. The drain was removed, and the patient was discharged from the hospital on the third postoperative day in stable condition. He was given a course of oral antibiotics (Cefuroxime and Metronidazole) with painkillers.

The final histopathology study of the removed appendix showed acute suppurative appendicitis with peri-appendicitis. Subsequent follow-up examinations revealed the resolution of symptoms, complete healing of the abscess, and the no further complications.

Discussion

While intra-abdominal abscess is a well-recognized complication of perforated appendicitis, instances of extra-abdominal inflammation, such as scrotal abscess, are less commonly documented. This case emphasizes that scrotal abscesses may develop following appendectomy usually at the right side, but it happened, even on the left side [8]

While the processus vaginalis typically closes in most individuals, around 15-37% may retain it into adulthood [5]. The presence of both a patent processus vaginalis (PPV) and a perforated appendix should alert physicians to the potential for scrotal abscess formation. However, it's not unprecedented for scrotal abscesses to develop without a PPV [8-10]. The appendix's location permits the downward flow of pus through a PPV into the right hemiscrotum. In our case, despite the absence of an identifiable PPV, the abscess manifested in the left hemiscrotum.

It's conceivable that irrigation might have carried pus from the right to the left side, leading to contaminated fluid in the left pelvic and inguinal region. Vigilant inspection during irrigation and aspiration is crucial to ensure thorough evacuation of all purulent material, potentially causing intra-abdominal bacteria translocation through a closed processus vaginalis. Additionally, although no overt patency was evident in the processus vaginalis during surgery, the presence of a micro-perforation allowing purulent material passage into the left inguinal region and scrotum is possible. Our case, along with others in the literature, underscores that the absence of a distinct PPV doesn't preclude postoperative scrotal abscess formation. Notably, previous cases have reported abscesses on the left side both with and without a PPV post perforated Appendicitis. This reinforces the importance of ultrasound evaluation for acute scrotal pain and swelling following laparoscopic appendectomy. [8-10]

Conclusion

Scrotal abscess formation following appendectomy is an infrequently reported occurrence. While it typically occurs more frequently on the right side in the presence of a patent processus vaginalis (PPV), cases on the left side have been documented. Therefore, any post-appendectomy scrotal pain and swelling, irrespective of the side affected, requires evaluation to exclude the possibility of an intra-scrotal abscess.

Consent

Verbal and written informed consent were 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.

Authors' Contributions

- **Rami Shamiah:** study concept and design, data collection and analysis, writing the paper.
- **Bakhos Alhaddad:** study concept and design, data analysis, writing the paper.
- **Abdul Azim Hussain:** study concept and design, supervision, final approval of the paper.
- **Rafif Mahmood Al Saady:** manuscript writing and final editing.

Ethical approval

This case report was approved by the ethics committee, Al Ahli Hospital, Doha, Qatar. A copy of the approval letter is available for review upon request. The data that support the findings of this study are openly available upon request.

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