Case Report

Appendicitis or Not Appendicitis: A Case Report of Acute Appendicitis Complicated with Disseminated MSSA and Iliopsoas Abscess

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Abstract

This case report described a 17-year-old female with acute appendicitis complicated by Methicillin-Sensitive *Staphylococcus aureus* (MSSA) bacteremia and an iliopsoas abscess. Initially presenting with right iliac fossa pain and fever, she was diagnosed with acute appendicitis and underwent appendectomy. Postoperatively, she developed persistent fever and hip pain. Imaging revealed an abscess in the right iliacus muscle, which was drained percutaneously. MSSA was identified in the abscess culture. The patient recovered with targeted antibiotics. This case highlights the diagnostic challenges and importance of considering secondary infections in postoperative patients with atypical symptoms. Prompt recognition and treatment are essential for positive outcomes.

Keywords: Appendicitis; bacteremia; iliopsoas abscess; MSSA; *Staphylococcus aureus*

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Introduction

Acute appendicitis occurs when the appendix, a small pouch attached to the large intestine, becomes inflamed due to blockage, often from faeces, foreign objects, or infection. This blockage increases pressure and decreases blood flow, causing inflammation and pus accumulation. Symptoms include abdominal pain that starts near the navel and shifts to the lower right side, nausea, vomiting, loss of appetite and fever.

Acute appendicitis can be uncomplicated or complicated. Uncomplicated cases involve inflammation without additional issues. Complicated cases may involve perforation (rupture), abscess formation or fistula. Perforation is the most common complication and can lead to peritonitis and sepsis. Diagnosis generally involves physical examination, lab tests and imaging studies such as ultrasound or computed tomography (CT) scan. Treatment typically involves appendectomy.

Staphylococcus aureus (*S. aureus*) is a gram-positive bacterium found on skin and mucous membranes. It can cause a range of infections from minor skin issues to severe conditions like sepsis. *S. aureus* is known for its antibiotic resistance and production of virulence factors, contributing to its pathogenicity. It can also cause infections in various body parts, including the musculoskeletal system.

An iliopsoas abscess is a muscle abscess in the hip area, commonly caused by *S. aureus*. It can result from penetrating injuries, nearby infections, or dissemination from another infection site. Symptoms include severe pain and restricted hip movement. Early diagnosis and treatment are crucial to prevent serious complications.

Iliopsoas abscesses are relatively rare and can be more common in individuals with conditions like diabetes or those involved in strenuous activities. Treatment usually involves antibiotics and may require abscess drainage or surgery (1,2,3).

Case Report

Ms. A was a 17 years old girl, with no known medical illness prior. She was a boarding school student, not active in sport, not an intravenous drug user, not sexually active and had no history of trauma. She presented to Emergency Department, Hospital Canselor Tuanku Muhriz with a 1-week history of right iliac fossa region, which worsened 2 days prior the presentation. The pain was sharp with a pain score of 8/10 upon movement, non-radiating. She was still able to walk despite the pain. She was feverish for 5 days associated with poor oral intake, nausea, constipation, and no bowel output. Otherwise, she denied any trauma, diarrhoea, vomiting, dysuria, dyspnoea, chest pain or gynaecological symptoms. She had regular menses, no dysmenorrhea and no menorrhagia.

On examination, she was not septic looking, but was having high grade fever of 40.5℃. Her blood pressure was 120/78 mmHg, with a pulse rate of 137/min. On abdominal examination, the abdomen was soft, no guarding, mild tender on palpation over right iliac region and no rebound tenderness. Her blood test revealed raised pro-inflammatory markers, with a white cell count of 10.0 x 109/L and C-reactive protein (CRP) of 11.8. Her urea and creatinine were normal, urinalysis showed leukocyte 1+ with negative nitrites, and the chest and abdominal X-ray did not demonstrate any pathology. Gynaecology team was consulted to rule out any gynaecological pathologies and her transabdominal sonography showed normal uterus and ovaries.

Subsequently, a diagnosis of Acute Appendicitis was reached due to ill-defined clinical presentation. She was admitted under the surgical service, and was proceeded with open appendicectomy under general anaesthesia. Intra-operatively, the appendix was inflamed with minimal localised serous fluid over right iliac fossa region, which confirmed the primary diagnosis histopathology come back as early acute appendicitis. Microscopic section showed an appendix with intact mucosa. There was mild neutrophilic infiltration seen at the lamina propria. Dense neutrophilic infiltration observed within the lumen of the appendix. The serosa exhibits dilated and congested blood vessels. There was no obvious disruption of the muscularis propria. No evidence of malignancy seen. Post-operatively, she was afebrile for 1 day and her pain was minimal with normal vital signs.

However, since day 2 of post-appendicectomy, she developed persistent fever, not resolved with non-steroidal anti-inflammatory drugs (NSAIDs) and antibiotics (intravenous Augmentin and subsequent Cefoperazone). On the other hand, she was still having pain over right iliac fossa and hip to groin region and difficulty in walking. On further examination, it was revealed that her right hip range of movement (ROM) was limited and her gait was slightly antalgic. An orthopaedic consult revealed tenderness over right inguinal and lateral aspect of inner thigh and lateral border of right gluteal region, warm to touch, not erythematous, no swelling and no skin changes. She was unable to raise thigh straight but she was able to flex knee joint at 0-90°, with no tenderness at patella. The pelvic X-ray revealed no fractures, bony changes or change in joint space.

Her abdominal ultrasonography revealed well defined hyperechoic area seen at the right iliac fossa just adjacent to the right iliac bone measuring 2.4 x 4.6 x 3.7 cm (AP x W x CC) within right iliacus muscle (Fig. 1). Subsequently, the CT of her abdomen and pelvis demonstrated well-defined, rim enhancing intramuscular collection seen at the right iliacus muscle measuring 3.9 x 1.6 x 5.2 cm (Fig. 2). Anteriorly, the collection extends along the right iliac wing and had no clear fat plane with the right transverse abdominis muscle. Posteriorly, the collection was confined within the right iliacus muscle. Medially there was no intraperitoneal extension and laterally, the collection was in contact with the right iliac bone with no cortical break or periosteal reaction noted. The right gluteal muscles appeared more bulky, however no obvious collection seen. The bilateral psoas muscles were normal and there was no effusion in the right hip.

Percutaneous drainage using interventional radiology techniques was performed and 5 cc of pus was drained. The blood culture grew Methicillin-Sensitive *Staphylococcus aureus* (MSSA) with sensitivity towards intravenous Cefazolin. Her Transesophageal Echocardiography excluded infective endocarditis, tuberculosis, human immunodeficiency virus (HIV), and hepatitis screening were negative. During her febrile phase, her lactate dehydrogenase (LDH) was 230 and CRP remained raised. However, she achieved afebrile phase following 10 days of intravenous Cefazolin with reducing CRP level and white cell counts and procalcitonin of 0.05 (no systemic infection). The serial ultrasonography revealed resolution of the abscess and she had completed her 2 weeks course of intravenous Cefazolin with 4 weeks of oral Bactrim. Eventually, she was able to retain back her normal gait and the abdominal examination demonstrated no pathological signs.

FIGURE 1: US imaging showed right iliacus collection

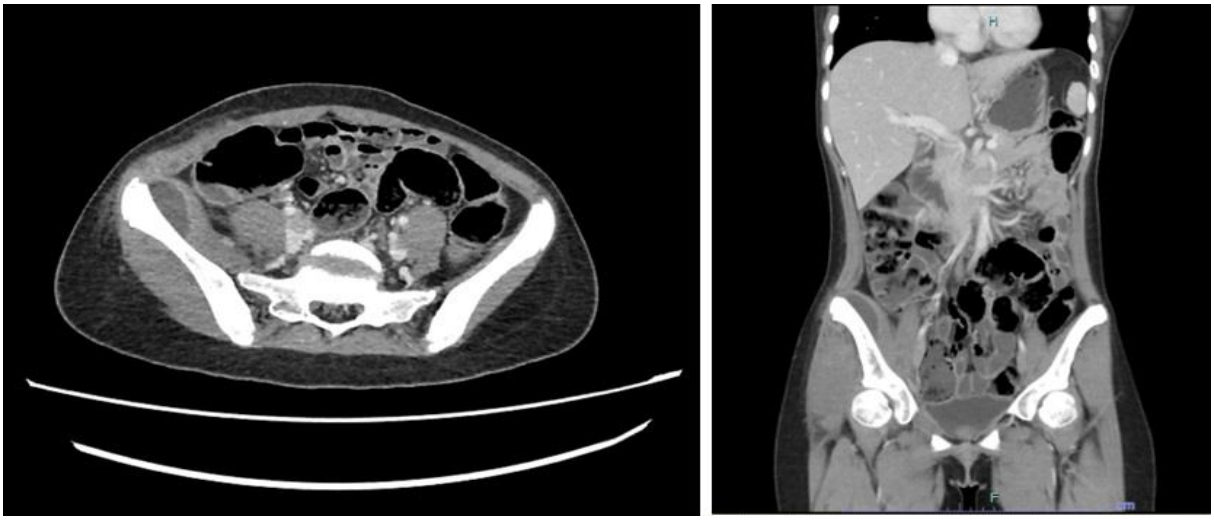

FIGURE 2: CT scan both axial and coronal views showed right iliacus collection

Discussion

This case illustrated the diagnostic and management challenges associated with acute appendicitis complicated by rare infections such as iliopsoas abscess and *S. aureus* (MSSA) bacteraemia. Acute appendicitis is typically a straightforward diagnosis, but when it progresses to severe complications, it becomes more complex and less predictable. Ms. A presented with symptoms overlapping between acute appendicitis and iliopsoas abscess, both of which can present with right iliac fossa pain and fever but require different management strategies.

Risk factors for these rare infections include the severity of the appendiceal inflammation, the presence of systemic bacterial spread, and delayed diagnosis. In this instance, the progression to MSSA bacteraemia and iliopsoas abscess indicates that the infection had likely spread beyond the localised site of appendicitis. Bacterial translocation, where bacteria from the appendix invade the bloodstream, can lead to systemic infections and complications (4). The development of MSSA bacteraemia from an inflamed but not perforated appendix aligns with findings suggesting that even less severe appendicitis can occasionally result in serious systemic infections (5).

Delayed diagnosis and suboptimal initial management were significant factors in the progression to these rare complications. Although the patient underwent appendectomy, the persistent symptoms and development of fever post-operatively suggested that the infection was more extensive. The literature supports that appendicitis can evolve into systemic infections if not promptly and effectively managed (4). Deodatus et al. (2021) noted that acute appendicitis could be associated with severe bacteraemia, though this is rare and usually linked with advanced or complicated appendicitis (6).

Management of rare infections such as iliopsoas abscesses and MSSA bacteraemia differs markedly from standard appendicitis care. In this case, the use of targeted antibiotics (Cefazolin) was crucial, as MSSA requires specific treatment to ensure effective eradication. MSSA is known to cause deep-seated infections that can lead to complicated presentations if not treated appropriately (5). Additionally, percutaneous drainage of the iliopsoas abscess proved effective. Studies have shown that CT- or ultrasound-guided percutaneous drainage is a minimally invasive approach with a high success rate in managing such abscesses (7,8). It provides a viable alternative to more invasive surgical interventions, reducing patient morbidity and recovery time.

The presence of bilateral lung nodules with ground-glass opacities noted on the CT scan may indicate disseminated infection, highlighting the potential for multi-organ involvement in systemic infections originating from appendicitis (jones). This finding reinforces the need for comprehensive evaluation and treatment when complications arise.

In summary, while acute appendicitis is commonly straightforward, its complications, such as iliopsoas abscess and MSSA bacteraemia, can present significant challenges. This case emphasises the importance of recognising and managing these complications promptly. Early and precise diagnosis, along with targeted treatment strategies, are crucial for preventing severe outcomes and ensuring effective patient recovery.

Conclusion

Acute appendicitis can indeed be complicated by rare but serious conditions such as iliopsoas abscess and disseminated bacteraemia. Although these complications are uncommon, they present significant diagnostic challenges due to the non-specific nature of their symptoms, which can overlap with those of acute appendicitis. This case underscores that even an uncomplicated case of acute appendicitis can evolve into severe complications if not promptly managed. In the presented case, the primary pathology was identified as uncomplicated acute appendicitis, but it should not be underestimated, as it can lead to significant complications such as deep-seated intramuscular abscesses and systemic infections, even in otherwise healthy young individuals. The presence of an iliopsoas abscess and MSSA bacteraemia highlights the importance of early recognition and intervention. Clinicians should maintain a high index of suspicion for potential complications and act swiftly to address them. Prompt and accurate diagnosis, along with targeted treatment strategies, are crucial to prevent severe outcomes and ensure effective recovery.

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