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AN UNCOMMON PRESENTATION OF ANTERIOR ABDOMINAL WALL NECROTIZING FASCIITIS EXTENDING FROM PERIANAL PUS COLLECTION THROUGH RETROPERITONEAL AND EXTRAPERITONEAL ROUTES: A CASE REPORT

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ABSTRACT

Introduction: Necrotizing fasciitis, a severe and promptly advancing soft tissue infection, is a medical emergency with a high death rate. While it typically involves the Limbs and perineal regions, we present an extraordinary case of anterior abdominal wall necrotizing fasciitis that originated from a perianal pus collection and extended through retroperitoneal and extraperitoneal routes, notably sparing the intraperitoneal and pelvic spaces.

Case Presentation: Our patient, a 45-year-old male with a history of ischemic heart disease, initially presented to our emergency department of King Hussein medical hospital with perianal pain and fever. He received prompt medical attention, including incision and drainage of the perianal abscess along with intravenous antibiotics. However, a week later, his condition deteriorated as he developed necrotizing fasciitis affecting the anterior abdominal wall. This unique presentation required immediate surgical intervention and drainage of both the perianal and anterior abdominal wall regions. Additionally, the patient received supportive parenteral nutrition and vacuum assisted dressing to aid in his recovery. While there have been observable clinical and laboratory improvements, the patient continues to receive wound management care as part of his journey towards full recovery.

Conclusion: This case report underscores the exceptional nature of this presentation and aims to enhance our comprehension of the clinical characteristics, management strategies, and the challenges posed by this unusual manifestation of necrotizing fasciitis. Such cases are exceedingly rare, making the documentation and dissemination of this case vital for the medical community's understanding and awareness.

KEYWORDS: Necrotizing fasciitis, anterior abdominal wall, perianal infection, retroperitoneal space, extraperitoneal space.

INTRODUCTION

Necrotizing fasciitis (NF) is a extraordinary and critical soft tissue infection characterized by the quick destruction of fascial planes and tissue enclosed.[1] It is characterized as medical emergency through its rapid course, high morbidity, and mortality rates.[2] This condition commonly presents in the Limbs, perineal region, and Perineum.[3] NF is associated with the broad expansive necrosis of the subcutaneous tissue located on the involved fascial plane, frequently coexist with gas production, which give rise to a systemic inflammation and sepsis.[4]

Necrotizing fasciitis can present in four different types, Type I which is the primary type, frequently referred as polymicrobial NF, commonly entails a mix of aerobic and anaerobic bacterial infection, being Streptococci, Staphylococci, and Enterococci, in addition to anaerobic species like Bacteroides and Clostridium, commonly present in trunk and perineum region, Type II, which is referred as monomicrobial NF, is frequently due to Group A Streptococcus (Streptococcus pyogenes) furthermore it may include Staphylococcus aureus, These microbial pathogens have high virulence and can progressively propagate through fascial surface, advancing toward substantial tissue damage, Type II is commonly present in limbs, both Type I and II are common in diabetic patients. Type III is often due to Clostridium or Vibrios spp, can present anywhere in the body with associated trauma or sea food consumption as risk factors. Type IV is uniquely seen in patients with immunosuppression, it is due to Candida spp and can present anywhere in the body.[5]

The likelihood of morbidity and mortality in NF patients is considerable, the mortality rates varying between 20% to 80%, determined by the causative microorganism, rapid detection, and treatment.[6] The Factors that influence the danger of spreading and exacerbation of the disease involve late diagnosis, associated chronic diseases such as immunosuppression or diabetes mellitus, and virulent bacterial pathogens, such as Group A Streptococcus and Clostridium species.[7]

Diagnosis of NF frequently determined by clinical findings, which include agonizing and severe pain, spreading skin erythematous changes, soft tissue gas which can be felt as crepitus on palpation (indicating gas producing bacterial infection), and signs of systemic sepsis.[8] Supportive diagnostic tools such as laboratory testing, involve raised inflammatory markers which include (leukocytosis, high CRP level), and radiological testing like computed tomography (CT) or magnetic resonance imaging (MRI) are crucial in confirming the diagnosis and delineating the extent of the disease.[9]

Treatment of NF is essentially surgical, including early aggressive debridement of necrotic tissue in addition to broad-spectrum intravenous antibiotics. Early intervention is significant and crucial to prevent additional tissue necrosis and improve disease outcome.[10]

Perianal abscesses, which commonly occur as localized collections of pus in the perianal region, are one of the potential sources for the development of NF. These abscesses can extend through anatomical fascial plane or soft tissue spaces pathways, including the ischioanal fossa, into the retroperitoneal and extraperitoneal spaces. The anatomy of these spaces allows for the dissemination of infection along fascial planes, further complicating the clinical course.[11]

While perianal abscesses can advance to NF, it is relatively uncommon for this infection to extend from the perianal region to the anterior abdominal wall through the retroperitoneal and extraperitoneal spaces, particularly without involving the intraperitoneal or pelvic spaces. The reasons for this rarity include the anatomical barriers posed by the transversalis fascia and the peritoneal lining, which serve as protective layers that typically limit the spread of infection into the intraperitoneal space. Understanding the mechanisms behind this unique presentation is essential to appreciate the complexity of such cases and underscores the significance of reporting and analyzing them in the medical literature.[11]

In this case report, we present a detailed account of an exceedingly rare case: an anterior abdominal wall necrotizing fasciitis extending from a perianal infection through retroperitoneal and extraperitoneal routes, highlighting the distinctive features of this presentation and the challenges in management. This case serves as a valuable addition to the limited body of literature on this subject, contributing to our understanding of the clinical characteristics and management of such remarkable cases.

CASE PRESENTATION

Our patient is a 45-year-old male with medical history, including ischemic heart disease and a previous laparoscopic cholecystectomy in 2021. Although recommended for coronary artery bypass graft (CABG) surgery due to ischemic coronary changes, he declined the procedure despite counseling.

The patient's current presentation began with a history of a perianal abscess, which had been treated with incision and drainage one week before his admission to our facility. Unfortunately, his condition took a dramatic turn as the infection progressed to an exceptionally rare form of necrotizing fasciitis. In this case, the necrotizing fasciitis extended from the perianal space through retroperitoneal and extraperitoneal routes, notably without involving the intraperitoneal or pelvic spaces. Figure.[1-3]

Upon arrival at the Emergency Room (ER), the patient complained of severe perianal pain, abdominal pain, fever, and vomiting. These symptoms had been progressively worsening over the week following the initial incision and drainage procedure for the perianal abscess. During the abdominal examination, there were no notable findings on visual inspection, but left-sided abdominal tenderness was identified upon palpation, with no evident skin changes.

Laboratory results at the time of admission for the necrotizing fasciitis of the abdominal wall revealed significant abnormalities. The patient's white blood cell (WBC) count was elevated at 11,000, and his C-reactive protein (CRP) was markedly high at 300, indicating a severe inflammatory response. Septic workup, including urine and blood cultures, returned negative results. Additionally, the patient exhibited electrolyte imbalances, with low potassium levels (3) and low calcium levels (7.1). His glucose and kidney function were within the normal range. Hemoglobin A1c (HbA1c) was slightly elevated at 6.5, indicating a tendency towards hyperglycemia, and his albumin level was significantly reduced to 20.

Cardiac echocardiography revealed left ventricular hypertrophy with inferior apical wall hypokinesia, adding complexity to his medical history.

A CT scan was performed and demonstrated a perianal collection with diffuse gas locules Figure[1] extending from the perineum to retroperitoneal and extraperitoneal spaces Figure [2], ultimately reaching the anterior abdominal wall Figure [3]. This imaging indicated the presence of necrotizing fasciitis of the abdominal wall, with the perianal collection serving as the source of the

infection.

Following admission, the patient was promptly stabilized. He received intravenous (IV) fluids, a combination of IV antibiotics (metronidazole and imipenem), electrolyte correction, and pain management. These measures aimed to address his systemic infection and stabilize his vital signs.

On the day of admission, the patient underwent urgent surgical intervention. The surgical procedure involved incision and drainage of the perianal collection site, along with an additional incision and drainage on the left side of the abdominal wall, specifically at the site of maximum crepitation, located in the left iliac fossa. The surgical approach extended into the retro-muscular extraperitoneal space to drain the affected area and debride necrotic tissue. Notably, the peritoneal layer remained intact, and no opening into the intraperitoneal space occurred during the procedure Figure [4].

As a result of these interventions, the patient exhibited clinical and laboratory improvement. Consequently, the patient is currently undergoing frequent surgical sessions for debridement and drainage, in conjunction with supportive parenteral nutrition and vacuum assisted dressing, as part of his ongoing care and management Figure [5].

This case presents a unique and exceptionally rare manifestation of necrotizing fasciitis, extending from a perianal infection to the anterior abdominal wall through retroperitoneal and extraperitoneal routes. The complexity of this case underscores the importance of understanding such unusual presentations and the challenges they pose in diagnosis and management.

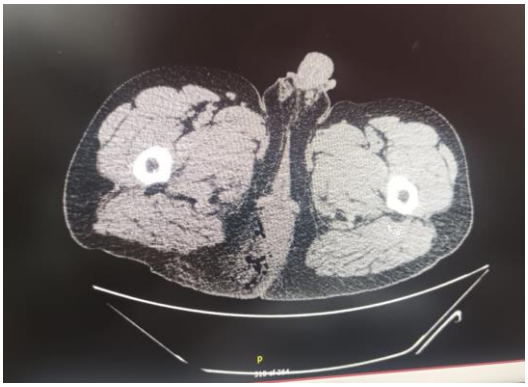

Figure 1: Perianal pus collection with gas.

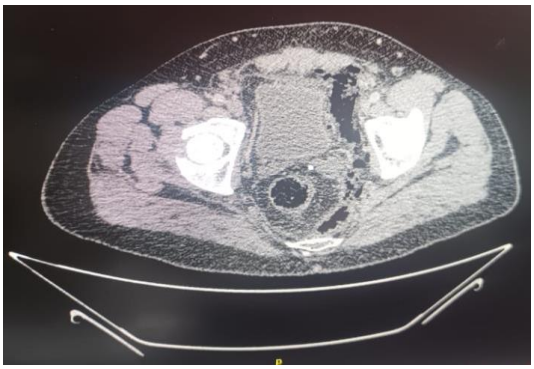

Figure 2: Gas extending from perianal area upward through extraperitoneal, retroperitoneal route.

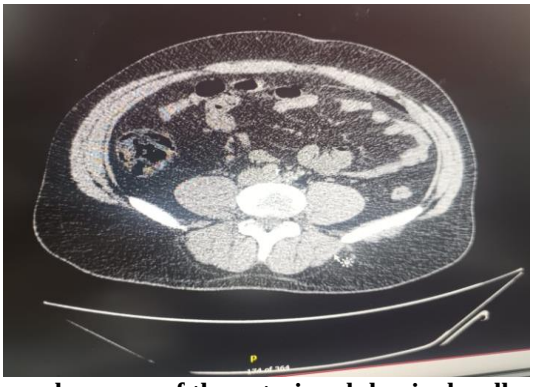

Figure 3: Gas located in retromuscular space of the anterior abdominal wall and not extending to peritoneum

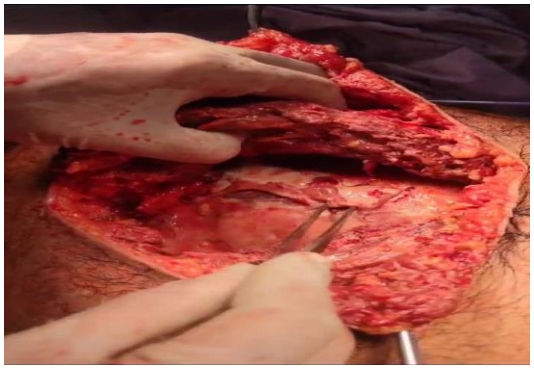

Figure 4: Left sided anterior abdominal wall surgical incision showing Skin and Subcutaneous layer, muscle layer and intact peritoneal layer, Pus and Gas located below the muscular layer.

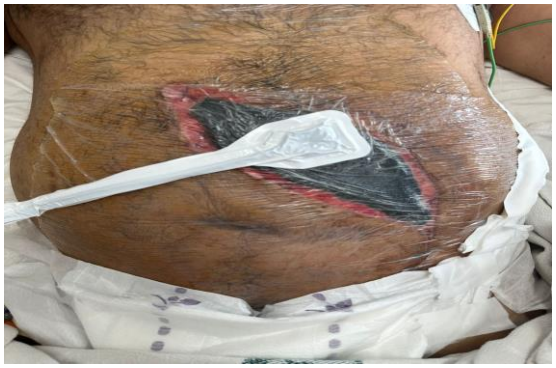

Figure 5: Application of vacuum dressing to the wound.

DISCUSSION

The presented case of anterior abdominal wall necrotizing fasciitis extending from a perianal infection through retroperitoneal and extraperitoneal routes, without involving the intraperitoneal or pelvic spaces, is exceptionally rare and warrants in-depth discussion.

The diagnosis of necrotizing fasciitis depends on clinical findings, including excruciating severe pain, erythema, and crepitus, which were evident in our patient, Laboratory findings, such as elevated CRP and leukocytosis, along with imaging studies like CT scans, play a pivotal role in confirming the diagnosis and determining the extent of the disease.[12] In our case, the CT scan revealed the source of infection in the perianal region and its dissemination through retroperitoneal and extraperitoneal routes to the anterior abdominal wall.

The patient's comorbidities, including ischemic heart disease and a history of laparoscopic cholecystectomy, added complexity to his clinical presentation. His refusal of CABG surgery underscored the challenges in optimizing patient care in the context of significant medical history.

Despite clinical and laboratory improvement post-surgery, the patient continued to experience recurrent wound discharge and tissue necrosis. The persistence of this symptoms highlights the ongoing challenges in managing complex cases of necrotizing fasciitis.

This case report underscores the importance of documenting and analyzing rare presentations of necrotizing fasciitis. Such cases provide valuable insights into clinical characteristics, management strategies, and the challenges posed by these unique manifestations.

CONCLUSION

This case of anterior abdominal wall necrotizing fasciitis extending from a perianal infection through retroperitoneal and extraperitoneal routes, without involving the intraperitoneal or pelvic spaces, provides valuable insights into the complexities involved in the diagnosis and management of this rare condition. It emphasizes the significance of early surgical intervention, diagnostic imaging, and a multidisciplinary care approach with radiology team, wound management team and nutritionists. Additionally, it underscores the importance of ongoing research and documentation to enhance our understanding of these exceptional presentations and improve the care of patients with necrotizing fasciitis.

Ethical declaration:

Approval of the ethical committee is pending for publication, written consent of approval from the patient is secured.

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None.

Conflict of interest:

No conflict of interest for publication of manuscript.

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