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Rare case of acute pyomyositis presenting with severe systemic septic shock in a young immunocompetent patient

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Abstract
We report a case of acute pyomyositis in a 21-year-old male patient with no medical comorbidities. He presented with an insidious onset of symptoms and signs of spreading multiple pyomyositis in the gluteal area and septic shock. The patient was immunocompetent and presented in stage 3 of the disease, which is an uncommon and life-threatening situation. The case was aptly diagnosed and managed with appropriate radiological investigations, surgical, intensive care, and consequent comprehensive wound management over a period of 3 weeks to achieve the best outcome and save the patient from morbidity and mortality. Such a case can easily be mistaken for necrotizing fasciitis.

Keywords: Acute pyomyositis, young age, immunocompetent, septic shock, necrotizing fasciitis, management

Introduction

Acute pyomyositis manifested as multiple inter-muscular abscesses in both gluteal areas, leading to a life-threatening septic shock, is an uncommon event in an immune-competent adult patient [2, 8]. Clinical diagnosis is often challenging and commonly mistaken for necrotizing fasciitis. We present a similar case that was effectively treated and sent home in a stable condition.

Case presentation

A 21-year-old male air conditioning mechanic came to the hospital with a complaint of spreading pain and swelling in the right buttock for 3 days of insidious onset, associated with inability to walk and fever. No past surgical or medical history. At the time of admission, patient was conscious and confused with Glasgow Coma Scale of 14, febrile (38.5 °C), tachycardia with heart rate exceeding 140 beats per minute, blood pressure of 90/60 mm Hg, and tachypnea with oxygen saturation at 98%. The Sequential Organ Failure Assessment score was 7 (Table 1). On local examination, there was right thigh and gluteal area induration and cellulitis with cellulitis spreading to the left gluteal area.

A pelvis CT scan revealed an enlarged right gluteus medius muscle with changed density and spread fibers. Furthermore, there was a presence of fluid accumulation beneath the muscle fascia, affecting the skin above it, with edema in the subcutaneous tissue and stranding of subcutaneous fat. This extended to surrounding muscles like the gluteus minimus and tensor fascia lata, as well as to the vastus lateralis muscle and the lateral side of the upper thigh. This indicates an inflammation process (Figures 1, 2) suggesting Myositis with accumulation of fluid beneath the skin.

Management

Admitted to the ICU, initiated empirical treatment with Linezolid and Meropenem antibiotics, receiving inotropic support. Scheduled for prompt surgical exploration and drainage of gluteal intramuscular abscess. The surgical procedure under general anesthesia within 2 hours of arrival revealed a large abscess in the right buttock muscles extending to the muscles in the outer thigh, filled with pus pockets and accompanied by cellulitis. The abscess was drained through incisions made in the right buttock area and thigh (Figure 3).

The patient's septicemia resolved the following day, with his vital signs and renal function returning to normal. However, on the third day after admission, the patient experienced escalating pain in the left gluteal area along with an increase in C-reactive protein levels.

Consequently, an MRI of the pelvis with contrast was performed, revealing a new abscess located beneath the gluteus maximus on the left side (Figure 4).
A second procedure of incision and drainage under spinal anesthesia was done on the 3rd day. There was a deep inter-muscular abscess on the left side between gluteus maximus and minimus. Gluteus maximus was split vertically to remove all the pus and necrotic debris (Figure 5). There was residual pus in the right abscess cavity, which was drained. On the same day, the antibiotics were changed from linezolid to clindamycin following a culture report showing methicillin sensitive Staphylococcus aureus. No MRSA was isolated.
After that, the patient received regular dressing changes, leading to a slow healing process with granulation of the wound. On the 8th day of hospitalization, a vacuum-assisted dressing was applied while the patient was under general anesthesia. An internal medicine consultation was performed to exclude muscular degenerative and autoimmune disorders, and screening tests for ANA, AMA antibodies showed normal results. Negative results were also found for anti-TTG antibodies, and ceruloplasmin levels were within the normal range.
Thirteen days post-admission, the wound was cleansed and the gluteus maximus was brought together with 1-0 Vicryl while under spinal anesthesia; then, a vacuum dressing was applied. On day 17 of admission, the vacuum dressing was removed. Healthy granulation tissue and decreased abscess cavities were noted (Figure 6), with no signs of necrotic tissue or pus. The patient's dressing was changed on the 21st day of admission before being discharged with advice to do dressing at a primary health center. The patient was then followed up in the outpatient clinic 10 days later, at which point the wound was completely closed.

Discussion
Acute pyomyositis, in general, is an uncommon condition. It occurs as a result of hematogenous spread of infection.[1] It can commonly occur in tropical countries (mainly Africa) in children and young patients, and less commonly in non-tropical countries as a sporadic case [4].
The most common causative microbial agent is Staphylococcus aureus, up to 90%, and up to 5% include Group B Streptococcus [1]. The probability of Methicillin-resistant Staphylococcus aureus infection increases in patients with an immunocompromised state [8, 9]. These groups of patients are also at risk of having gram-negative infections, which include Klebsiella, E. coli, and Pseudomonas [5, 7]. Anaerobes, fungi, and viruses are rarely implicated [6, 8]. Trichinosis and Lyme disease may present with features of acute myositis along with other manifestations [6]. In the majority of instances reported, it is common among immunocompromised patients, including those with HIV, chronic liver and kidney disease [7].
Due to the depth of infection, clinical presentation is often delayed by up to 10 days.[2] Patients presenting with early symptoms like fever, painful swelling, and redness might mimic cellulitis or a localized deep abscess, whereas late presentation might result in sepsis, spreading infection, and clinically resembling necrotizing fasciitis [1]. Acute pyomyositis presenting in sepsis is uncommon among young, immunocompetent patients. Radiological investigations such as CT scan and MRI of the affected area often lead to early diagnosis in suspected cases with the specific findings of progressive development of multiple intramuscular inflammation and abscess formation []2, 7, 11]. Ultrasonography is a potentially useful diagnostic tool, particularly during the purulent stage of infection when it may reveal diffuse muscle hyper echogenicity with or without localized hypo echogenicity and diffuse hyperemia [9].
Acute pyomyositis is divided into three clinical stages, [1] wherein stage 1 represents the 1st week of the disease process with systemic manifestations of fever, pain, and tenderness over the involved muscles with an early small abscess formation, which is clinically not apparent. Stage II represents the disease between the 2nd and 3rd weeks, which clinically presents with continuing fever, increasing pain, and clinically apparent multiple intramuscular abscesses, associated with marked leukocytosis and raised C-reactive protein. Stage III represents an advanced disease with the presentation of stage II findings associated with clinical signs of sepsis. The reported case presented in stage III of the disease.
Stage I is usually treated conservatively with empirical antibiotics, [9, 10] while stage II and III require incision and drainage of the abscesses apart from the antibiotic treatment [9, 10]. For immunocompetent individuals, initial empiric parenteral antibiotic therapy should be directed against staphylococci, including MRSA and beta-hemolytic streptococci [4, 8]. The immunocompromised individuals requires broad antibiotic coverage for gram-positive, gram-negative, and anaerobic organisms and an empirical vancomycin (MRSA coverage) may be added [4, 9].

Table 1: showing laboratory investigation findings at admission

Parameter	Value
WBC	12.65
HGB	13
CRP	327.3
Creatinine	152
NA	133
K	2.91

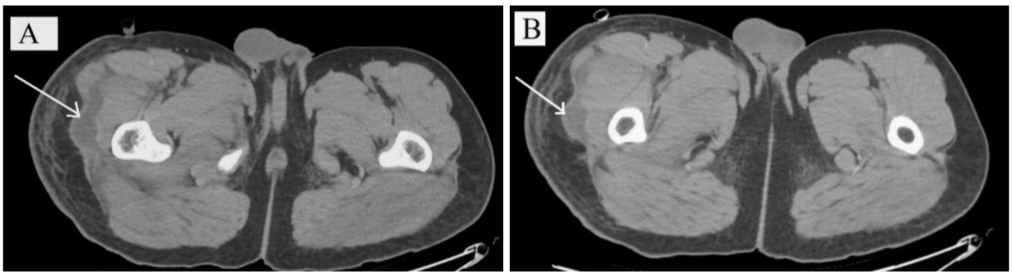


Fig 1: A&B CT Scan of Pelvis showing intramuscular pus collection in the right gluteal muscles

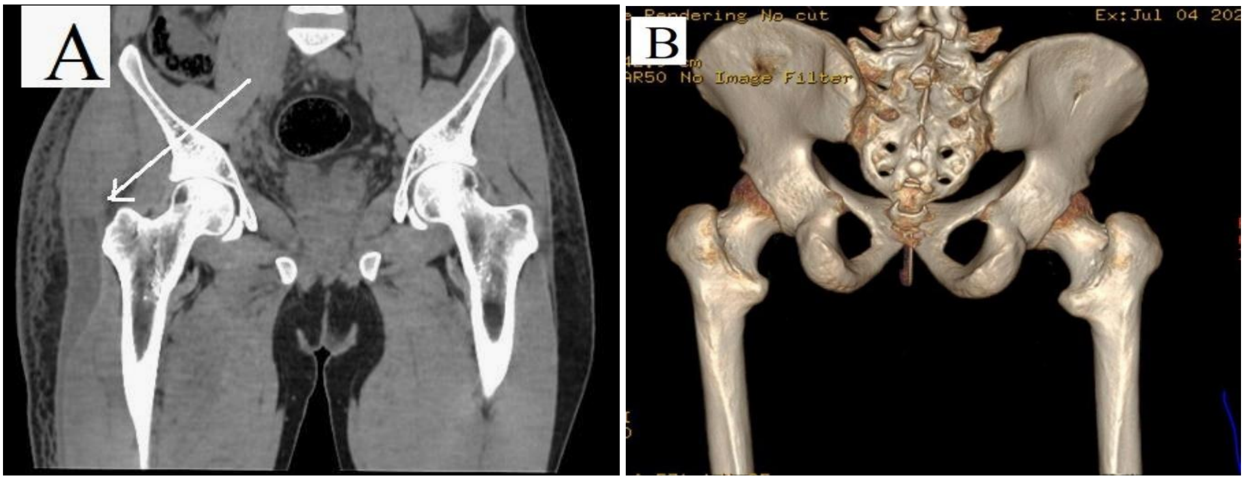


Fig 2: CT scan of pelvis A: coronal view showing intramuscular collection, B:bone window showing normal pelvic bones

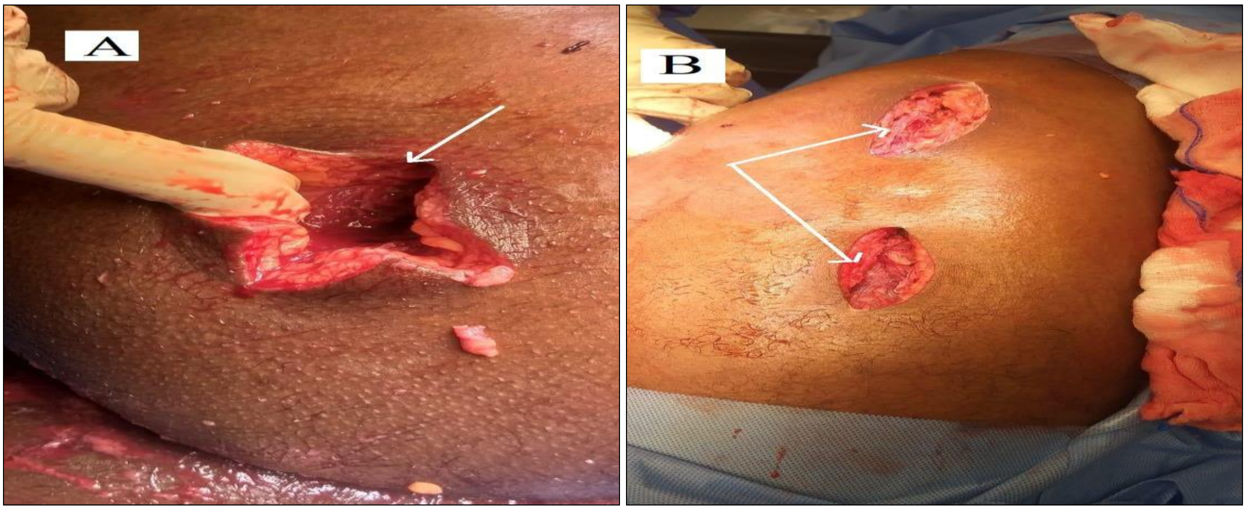
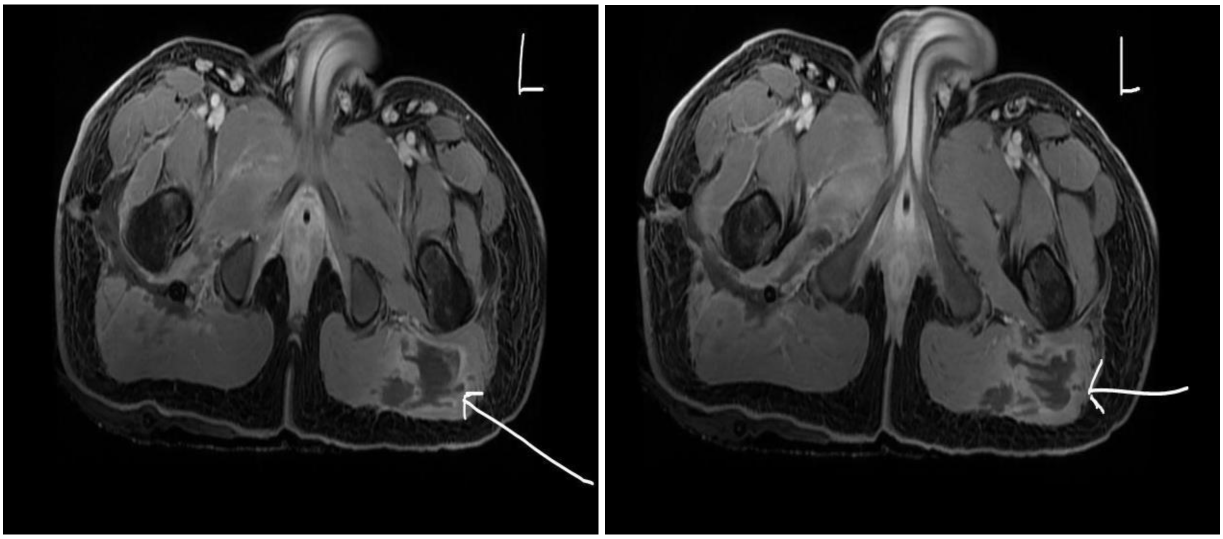


Fig 3: surgery image showing A: gluteal abscess incision site, B: showing lateral upper thigh extension wounds



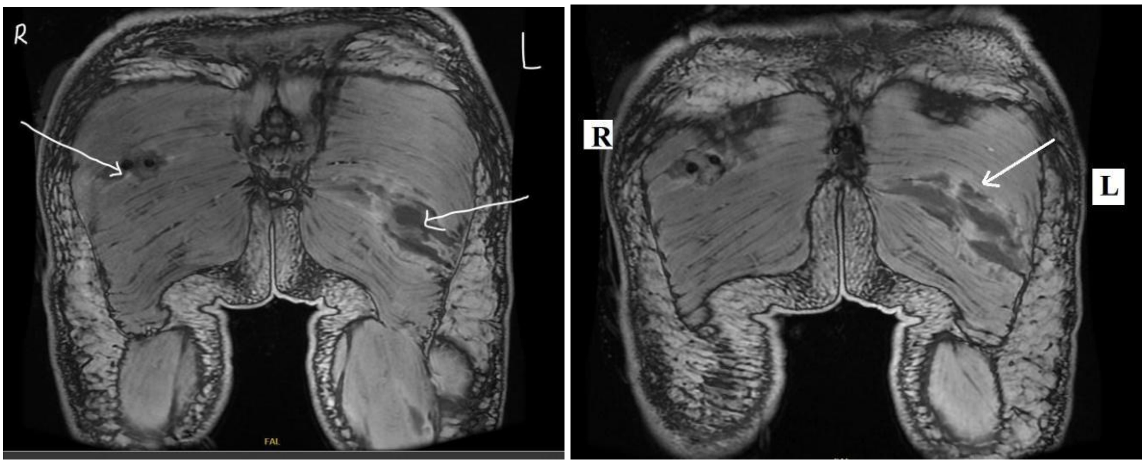


Fig 4: MRI of the Pelvis showing new intra gluteal abscess developing on left side and small residual abscess on right side

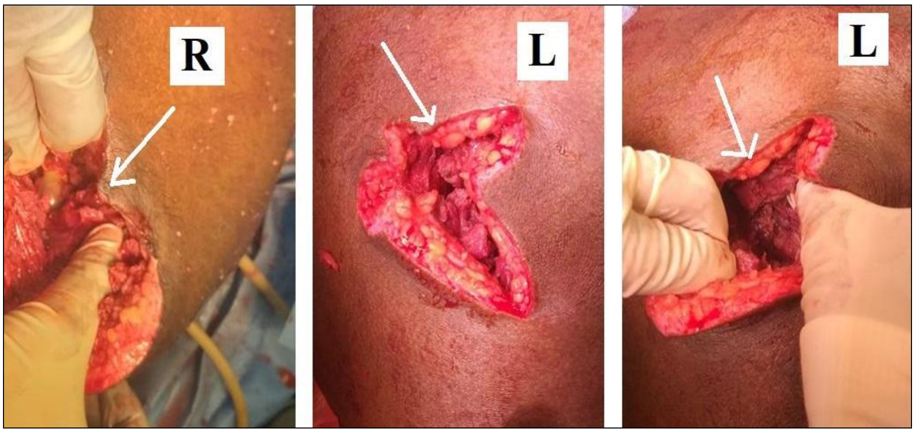


Fig 5: 2nd operation images showing reopening and debridement of previous right gluteal collection and drainage of newly developed left gluteal collection

Fig 6: image showing final appearance of the both gluteal wounds on discharge

Conclusion

Acute pyomyositis is a relatively rare clinical condition, which may pose diagnostic challenges in initial stages and management challenges in late stages confusing it with necrotizing fasciitis. The case reported is a rare clinical case as it was an insidious onset in a young male patient without any co-morbidities and stage 3 of disease which is an uncommon and life-threatening situation. The case was aptly and timely diagnosed and managed with an appropriate surgical, intensive care and consequent wound management to get best out come in a short duration.

Disclosure

This case report is done after getting informed consent from the patient for the purpose of publication, using clinical findings, laboratory data, radiological images and operative pictures. This case report is submission done after local Research and ethical committee approval. This Case report is done as per SCARE guideline Checklist

No Funding was obtained from any entity. the researchers have no conflict of interest

Authors' Contributions

Planning and designing the study: Srinivasa Swamy; data gathering: Srinivasa Swamy and Mina Shehata; initial draft of the manuscript: Srinivasa Swamy. Each author in this case report made an equal contribution. All read the draft and worked together to conduct a literature search. All authors approved the final version of the case report.

Abbreviations: mm Hg = millimeter of mercury, G.A. = general anesthesia, WBC = white blood cell count, HGB = hemoglobin, CRP = C-reactive protein, NA = sodium, K = potassium, MRI = Magnetic Resonance Imaging, MRSA = Methicillin Resistant Staphylococcus Aureus, E.coli=Escherichia Coli, SCARE = Surgical Case Report, , CT = Computerized Tomography, ANA = antinuclear antibody, AMA = antimitochondrial antibody, TTG = tissue transglutaminase antibodies, M.S.=master of surgery, MRCS= member of royal college of surgeons

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