

Severe *Streptococcus equi* infection with bacteraemia, myositis and micro-abscesses in a 17-year-old healthy female following horse exposure

A. Abdelgadir¹, A. Ahmed¹, G. Handelman², U. Doherty¹, S. Jose¹, A. Milos¹, K. Razaq¹.
M. B.Mdyneaux¹, S. Ali¹, Sh. Kiaran¹

1. Infectious Diseases Department, University Hospital Limerick, St Nessian's Rd, Dooradoyle, Co. Limerick, Ireland.
2. Radiology Department, University Hospital Limerick, St Nessian's Rd, Dooradoyle, Co. Limerick, Ireland.

Abstract

Presentation

A 17-year-old healthy female presented with severe *Streptococcus equi* (*S. equi*) bacteraemia, left thigh myositis, micro-abscesses in the adductor minimus muscle and concomitant influenza B virus infection. She reported sporadic contact with horses.

Diagnosis

Was confirmed by positive blood culture, contrast-enhanced MRI of the left thigh, patient history, clinical findings, raised creatine kinase (CK), white blood cell (WBC) count, and C-reactive protein (CRP).

Treatment

The patient received six weeks of intravenous (IV) Daptomycin, guided by blood culture and sensitivity report.

Discussion

S. equi is an uncommon zoonotic pathogen with diverse clinical manifestations. This case highlights the impact of transient immunosuppression, potentially induced by the influenza B virus infection, on the severity of *S. equi* infection. Furthermore, it emphasizes the importance of a thorough clinical history to prevent diagnostic delays and suboptimal outcomes.

Introduction

Strep Equi is a Gram-positive Lancefield Group C beta-haemolytic streptococcus bacterium that causes strangles in equines and can be a zoonotic pathogen^{1,2}. Human infection sequelae include bacteremia, myositis, osteomyelitis, native valve endocarditis, and septic arthritis^{3,4,5}. The incubation period is 4 to 8 days, with the infection more prevalent and potentially lethal

in individuals with diabetes mellitus, cardiac disease, immunocompromised conditions, elderly, and neonates, with a mortality rate of 33% to 66% if inadequately managed^{6,7,8}.

This case underscores the significance of comprehensive history-taking in expediting diagnosis and treatment and preventing complications. The significance of this case arises from the infection severity, which was prompted by a brief immunosuppressive state because of influenza B virus co-infection.

Case Report

A 17-year-old female presented to the emergency department with one week of malaise, sore throat, cough, and fever, which were improved after two days, so she participated in a horse grooming show. She fell ill again, prompting her to come to the hospital.

On admission, she had normal renal function tests (RFT) and liver function tests (LFT). Her CRP was 16 mg/L (normal: 0-5 mg/L) with lymphopenia and a positive influenza B virus test. We sent her blood for culture and sensitivity testing and discharged her with recommendations for self-isolation and rest due to influenza B infection.

Her blood culture was positive for *Streptococcus equi*, prompting readmission. Upon arrival at the emergency department, she reported a left lower limb rash, swelling, and pain during weight-bearing activities [Image1]. She denied neck stiffness, photophobia, trauma, or recent travel. She has no significant past medical or family history.

She had unremarkable clinical examinations except for antalgic gait resulting from left lower limb pain and a left thigh macular blanching rash extending to the calf. On the third day of admission, the CRP increased from 16 to 290, and CK level was 15577 U/L. She was on I.V Ceftriaxone initially, which changed to I.V benzyl penicillin after sensitivity was reported; susceptibility to Clindamycin, Daptomycin, and Benzyl-penicillin.

Necrotizing fasciitis was ruled out, so the differential diagnosis was *S. equi* bacteremia, left lower limb cellulitis, and myositis. She had normal left lower limb X-rays and echocardiography. On the fifth admission day, her left thigh MRI with contrast was consistent with myositis affecting medial and posterior compartments, with non-enhancement in multiple regions within the adductor minimus muscle, raising concerns for micro-abscesses, alongside adductor magnus muscle hypo-enhancement, which was indicative of myonecrosis with no signs of bone marrow changes, necrotizing fasciitis, or compartment syndrome [Image2,3].

CRP and CK levels improved on Benzyl Penicillin, with lymphopenia resolved on day five. She developed a generalized urticarial Penicillin allergy rash, necessitating a switch to I.V Daptomycin, which continued for six weeks via Peripherally Inserted Central Catheter (PICC) line. Her CK and CRP were normalized after 9 days and 4 weeks, respectively, indicating overall improvement. We discharged her on Outpatient Parenteral Antimicrobial Therapy (OPAT) and outpatient follow-up. A follow-up MRI with contrast in two months reported significant

improvement, revealing only mild residual myofascial edema, necessitating no follow-up imaging [image4].

Discussion

This study involves a healthy, immune-competent adult who had influenza B virus and severe Strep equi infections. The influenza virus exhausts innate and adaptive immune responses by depleting immune cells, reducing Type I interferon (IFN) levels, increasing oxidative stress, and triggering a cytokine storm, resulting in immunological compromise⁹. We believe that the influenza B virus induces an immunosuppressive state, elucidating severe S. equi infection. We highlighted the significance of inquiring about a patient's occupation and environmental exposure to zoonotic infections. This will mitigate diagnostic and treatment delays, thereby reducing morbidity and interventions.

Images:



Image 1: Left thigh Rash due to Strep Equi myositis with micro-abscess. Following horse exposure

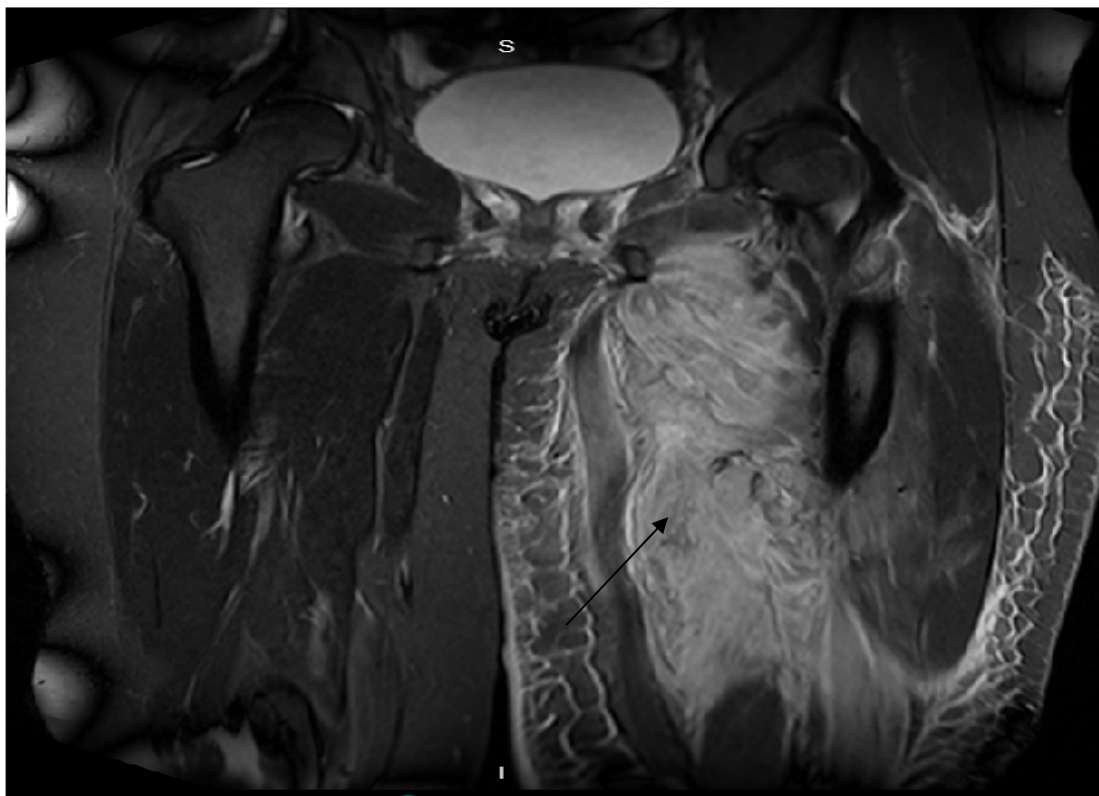


Image 2: T2-weighted short-tau inversion recovery image of the hip and pelvis

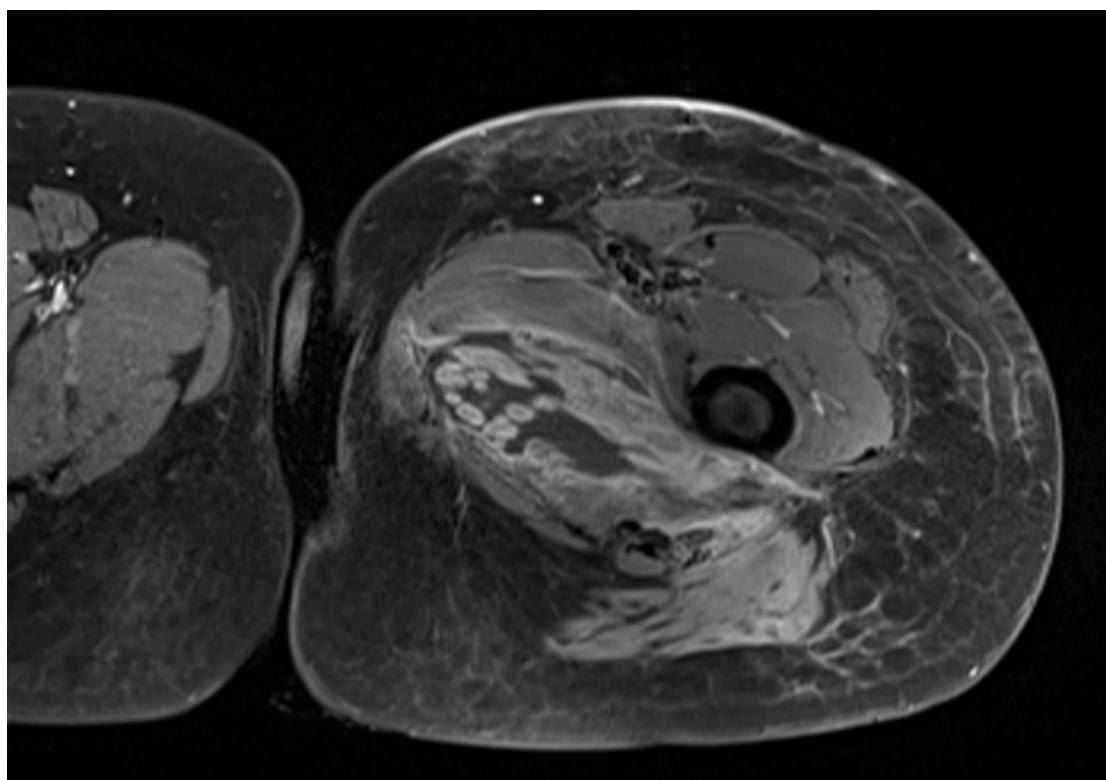


Image 3: Axial t1 FS post contrast index scan; demonstrates the abscess/non enhancing areas. Micro-abscesses due to Strep Equi myositis following horse exposure

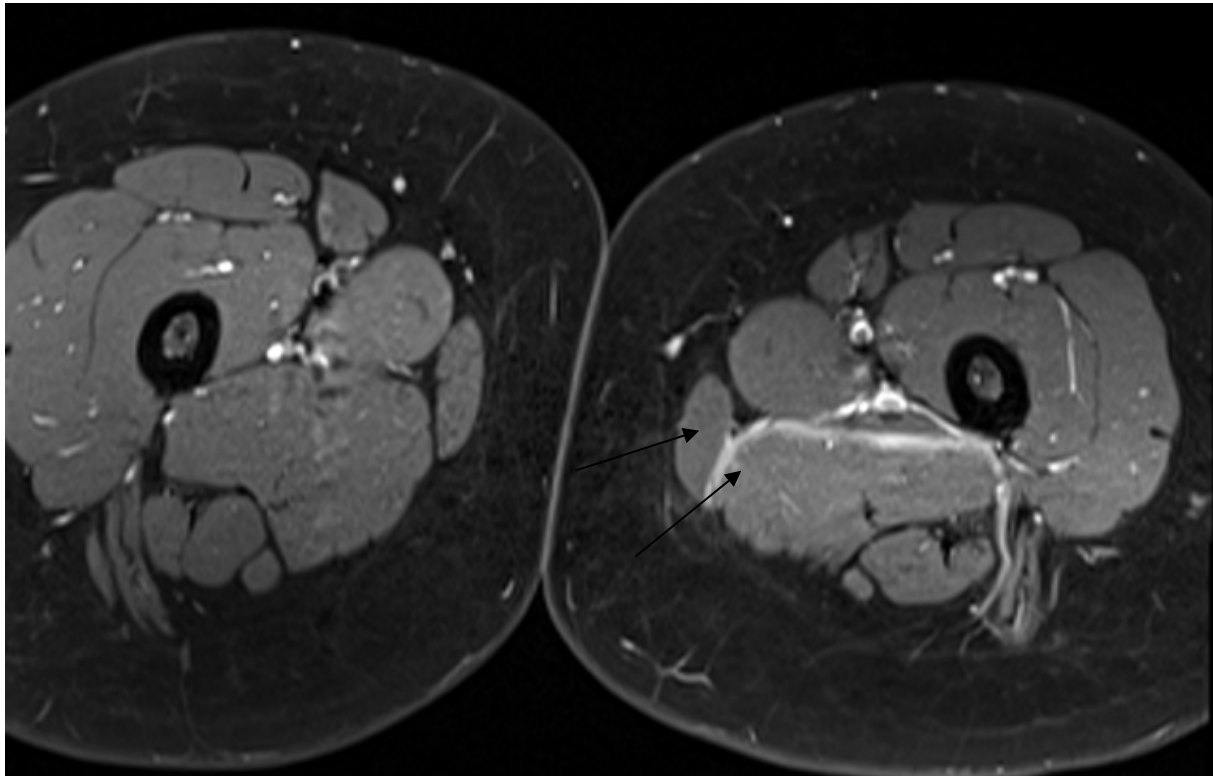


Image 4: Axial t1fs post contrast end of treatment scan showing residual mild perifascial enhancement. Suggested comment “Image shows marked improvement from index scan with only mild residual myofascial oedema and enhancement” after six weeks of I.V Daptomycin.

Declaration of Conflicts of Interest:

None declared.

Corresponding Author:

Ahmed Abdelgadir,
Infectious Diseases Department,
University Hospital Limerick,
St Nesson's Rd.,
Dooradoyle,
Co. Limerick,
Ireland.

E-Mail: aaaahmed17@hotmail.com

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