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A Unique Case of Glenohumeral Joint Septic Arthritis by Streptobacillus Moniliformis

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Abstract

Streptobacillus moniliformis is a zoonotic organism identified in the oral cavities and respiratory tracts of rodents. Infected bites are characterized by fever, rash, sore throat, headache, vomiting, myalgia and reactive arthritis of major joints. However, on rare occasions, patients may present with septic arthritis of a joint as a primary manifestation.

We report a case of septic arthritis of the glenohumeral joint in a 32-year-old female patient after a rat bite. The patient presented to our department with shoulder pain and loss of joint range of movement. Radiological investigations identified inflammatory fluid in the glenohumeral joint and blood infection markers were raised. The patient underwent arthroscopic washout of the glenohumeral joint and sub-acromial space followed by intravenous and oral antibiotics. Post-operatively the patient made full recovery in 8 weeks and regained full range of movements with no residual sequela.

Keywords: *Septic arthritis, Streptobacillus moniliformis, Rat Bite Fever.*

Introduction:

Streptobacillus moniliformis is gram-negative bacteria found commonly in the respiratory tract of rats. Along with Spirillum minus, it is the causative agent of Rat-bite Fever (RBF), a systemic bacterial illness associated with fevers, rigors, hemorrhagic rash and polyarthralgia3. The bacteria can be transmitted through the bite or scratch of a rat, or less frequently through ingestion of water contaminated with infected rat feces. Rat-bite fever is associated with a 10% mortality rate and 10% of those bitten are thought to be infected. Despite this, public awareness of rat-bite fever remains low **[**1**]**.

Case Report:

A 32-year-old female veterinary doctor presented to the orthopedic department with a 2-week history of worsening left shoulder pain and a reduced range of movement. She attributed her symptoms to injuries she may have sustained during rugby matches she played before the onset of shoulder pain. She also informed us that she had a left shoulder rotator cuff repair with non-absorbable sutures 5 years ago that was uncomplicated.

She denied any fever or rigor but had a rat bite on the right hand 2 weeks ago in her veterinary clinic but received no treatment for it. After the bite, she had a brief period of low-grade fever and was generally feeling unwell. She took some simple analgesia in the form of Paracetamol and she was able to go back to rugby practice. As she had progressive shoulder stiffness and pain, she was reviewed by the team physician and had a Magnetic Resonance Imaging (MRI) of the shoulder at the rugby club and was referred to our hospital for further management.

On examination, she was systemically well with severe stiffness, pain, associated erythema and swelling of the left shoulder. Blood inflammatory markers were raised with CRP 101 mg/l (normal <5 mg/L), WCC 12.6 x109/l (normal 4.0 -11.0 x 109/l) and neutrophils 10.21 x109/l (normal 2.00 -7.50 x 109/l). Blood cultures were taken and as she was systemically well, antibiotics were withheld until a sample was obtained from the affected joint. An X-ray of her shoulder showed a subacromial effusion with slight inferior pseudo subluxation of the glenohumeral joint (Fig. 1). MRI scan of the shoulder revealed significant inflammatory fluid in the joint suspicious of septic arthritis (Fig. 2). Aspiration of the joint was attempted which was a negative tap. She was taken to the operating theatre where she underwent arthroscopic washout and debridement of the left shoulder. Turbid fluid was identified in the joint and sub-acromial space along with significant inflammation. Tissue and fluid samples were sent to the microbiology for gram staining and culture that grew S moniliformis. She was reviewed by the infectious diseases team and started on a 7-day course of intravenous Ceftriaxone 2g once daily followed by a 14-day course of oral Doxycycline 100mg twice daily. A bedside echocardiogram was performed to check

for any evidence of infective endocarditis as this is thought to be a known complication of S moniliformis **[**5**]**.

Her progress was regularly monitored with blood and bedside clinical examination. She had full recovery in 8 weeks and regained full range of movements (Fig. 3) and no residual symptoms or postoperative complications.

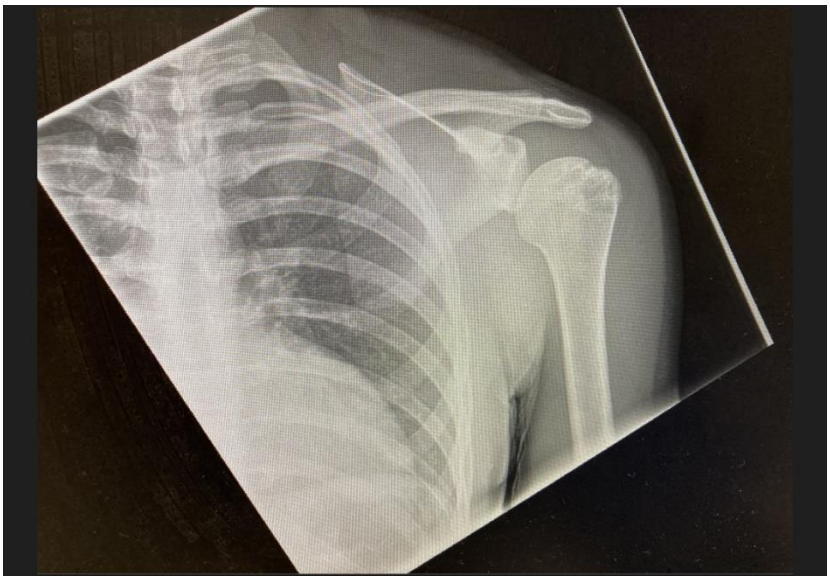

Figure 1: Radiograph left Glenohumeral joint

Figure 2: MRI coronal view (T1-weighted) left shoulder-demonstrating fluid in glenohumeral joint

Figure 3: Range of movements at 8 weeks

Discussion:

The classic presentation of S moniliformis infection is fever, rash, arthralgia and myalgia **[**1**]**. However, patients may present with septic arthritis of a major joint as the only presenting symptom with no other symptoms. A high index of suspicion is, therefore, necessary to identify septic arthritis. Peripheral joints are more commonly involved with the knee joint being the most common **[**4**]**. Small joints of the hand may be involved with direct penetrating injury from a bite. Children with pet rats, farmers and veterinary doctors are at high risk of rat bites and infective arthritis secondary to S. moniliformis. Identification of the organism in the joint fluid or blood is the key to diagnosis and a successful outcome for the patient. If left untreated, rat-bite fever has a high mortality rate of approximately 10% and 1 in 10 individuals who are bitten go on to develop a rat-bite fever. Therefore, there should be greater public awareness about the risks of rat bites. Those with an occupational risk or pet rat owners should be vigilant regarding symptoms after a rat bite **[**1**]**.

S.moniliformis is susceptible to multiple antibiotics. We recommend arthroscopic debridement of the joint followed by1 week of intravenous antibiotics and 2 weeks of oral antibiotics once discussed with microbiologists and infectious diseases teams. Follow-up with blood inflammatory markers and clinical examination is required for at least 8 weeks. This case report has highlighted that patients can make a full recovery even after a delayed presentation to the hospital with prompt recognition of the pathogen and appropriate treatment.

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None.

Conflict of Interest:

None.

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Ethical Approval:

This study did not require formal ethical approval.

Consent:

Written consent was obtained from the patient for publication of this case report and accompanying pictures.

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