CASE REPORT

Primary Psoas Abscess in an Immunocompromised Patient Caused by *Streptococcus intermedius* and *Escherichia coli*

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Abstract:

Psoas abscess is a rare medical disease. *Streptococcus intermedius* is a commensal of the mouth and the upper respiratory tract but can cause various pyogenic infections especially liver and brain abscesses but rarely muscular abscess even in an immuno-compromised host. We report a case of primary psoas abscess in a HIV positive patient caused by *Streptococcus intermedius* along with *Escherichia coli*. The patient responded well to antibiotic treatment along with percutaneous abscess drainage.

Keywords: Primary Psoas Abscess, Seropositive, *Streptococcus intermedius*, *Escherichia coli*

Introduction:

The Psoas major arises from the lateral borders of T12 to the L5 vertebrae with its tendon inserted into the lesser trochanter of the femur. The psoas muscle lies close to organs such as the abdominal aorta, kidneys, pancreas, jejunum, sigmoid colon, appendix, ureters, spine, and iliac lymph nodes. Hence infections in these organs can spread to it. Its abundant blood supply predisposes it to infections from occult sites by haematogenous or lymphatic spread [1].

Streptococcus intermedius is a member of *Streptococcus anginosus* group (also called *Streptococcus milleri* group) which belongs to *viridians streptococci.* This organism is microaerophilic and is a commensal of the mouth, upper respiratory and gastrointestinal tract but is capable of causing various pyogenic infections especially brain and liver abscesses [2, 3]. *Streptococcus intermedius* is extremely rare in causing psoas abscess according to Calza *et al*. [3]. Primary psoas abscess is more common in HIV infected patients and is generally caused by a single organism as compared to secondary abscess which is secondary to gastrointestinal, genitourinary, spinal and skeletal causes of trauma [4]. Even in HIV positive patients psoas abscess is most commonly caused by *Mycobacterium tuberculosis* and *Staphylococcus aureus* according to study by Shields *et al*. [4]. According to Jacobs *et al*, in 62.4% of abscesses caused by the *Streptococcus anginosus* group, accompanying flora was present*, E. coli* being the commonest [5]. We present a case with multiple rare findings, that is, primary psoas abscess caused by more than one organism, the causative organism being rare.

Case Report:

A 46 year old female was admitted to hospital with fever and pain in right iliac fossa since past ten days. Fever was on and off, of moderate grade with no chills or rigors. Pain over right iliac fossa was continuous, non radiating, not associated with aggravating or relieving factor. There was no history of nausea, vomiting, diarrhoea, constipation or history of passing blood in stools

or urine. There were no other urinary complaints or bone pain and headache. She was a known seropositive patient since twelve years and not taken antiretroviral therapy since then. There was past history of tuberculoma for which she had completed the course of antituberculosis treatment. There was no history of diabetes mellitus, hypertension, any trauma, urinary tract infection, surgery or surgical intervention in the recent past. On examination; abdomen was soft with tenderness present in the right iliac fossa. There were no significant respiratory findings. There was no swelling around the teeth. On admission the total white blood cell count was 12,800/mm^3 with neutrophilic predominance. Haemoglobin level was 7.5g/dl. Renal function and liver function tests were within normal limits. Erythrocyte sedimentation rate and C reactive protein were not asked for testing. Urinanalysis, electrocardiogram and chest X-ray showed no significant abnormalities. Sputum was sent for Acid Fast Bacilli (AFB) stain which was negative. Urine and blood were sent for bacterial culture which eventually did not show growth.

On Ultrasonography (USG), an ill-defined heteroechoic area in right iliac fossa, 5×4.5 centimetres in size was noted. Computerised Tomography (CT) scan of that area showed conglomerated peripherally enhancing centrally cystic abscess collection along right distal psoas muscle with focal anterior extra muscle component, 7.9×4×3.3 centimetres in size and there was no obvious erosion of spine vertebrae (Fig.1).

CT guided percutaneous drainage of collection was done using pigtail catheter. She was given intravenous ceftriaxone emperically. Pus was sent for aerobic bacterial culture, AFB staining which was negative and Xpert MB/RIF test (Cepheid, Sunnyvale, CA, USA) which is a nucleic acid amplification test and was negative for *Mycobacterium tuberculosis* complex.

Mycobacterial culture was asked which eventually did not show growth of *Mycobacterium* species. Anaerobic bacterial culture was not asked. Gram stain of the pus showed Gram positive cocci in pairs and chains and Gram negative bacilli in fair numbers. Sample was inoculated on 5% Sheep Blood Agar (SBA) and MacConkey agar (Himedia, Maharashtra, India) and incubated in a carbon dioxide incubator. At the end of 24 hours, there were two types of colonies on SBA and growth of lactose fermenting colonies on MacConkey agar (Fig.2). Type one colony on SBA was smooth tiny non haemolytic with a caramel like odour (Fig.3) and type two was grey, large, mucoid. Gram stain from these colonies showed Gram positive cocci in pairs and chains (Fig.4) and Gram negative bacilli respectively.

Manually, Gram positive growth was identified to the *Streptococcus viridians* level based on colony morphology, negative catalase reaction, vancomycin sensitivity, resistance to optochin and bacitracin (0.04U) disc and negative bile-esculin test. Identification and antibiotic sensitivity of both types was done using VITEK 2 COMPACT machine (bioMerieux, Marcy I'Etoile, France). GPId and ST01 and GNId and N280 cards were used for identification and antibiotic sensitivity testing of Gram positive and Gram negative isolates respectively. Gram positive growth was identified as *Streptococcus intermedius* and Gram negative growth was identified as *Escherichia coli (E. coli)*. *Streptococcus intermedius* was

susceptible to all class of drugs including ceftriaxone and *E. coli* was susceptible to all class of drugs including cephalosporins.

After 12 days, she was symptomatically better and discharged on amoxycillin-clavulanic acid, trimethoprim-sulfamethoxazole and antiretroviral therapy with the pigtail *in situ* and asked to follow-up after six days for review of pigtail and psoas abscess. On follow up, USG was suggestive of only diffuse inflammatory area at the original site with abscess resolved and hence pigtail was removed.

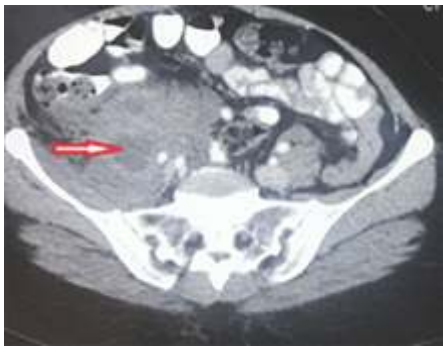

Fig. 1: CT Scan showing Cystic Abscess Collection along Right Distal Psoas Muscle

Fig. 2: Growth of Lactose Fermenting Colonies on MacConkey Agar

Fig. 3: Growth of Gram Positive Isolate on 5% Sheep Blood Agar

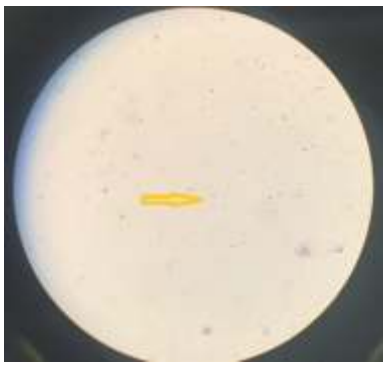

Fig. 4: Gram Stain of Type 1 Colony from 5% Sheep Blood Agar

Discussion:

Psoas Abscess (PA) is a rare disease and delay in its diagnosis may lead to high morbidity and mortality [6]. Fever and side pain are common symptoms with leucocytosis and anaemia as a common laboratory finding. PA is mostly unilateral with right side dominance [6]. In our study also, these findings were present. Based on the presence or absence of underlying condition psoas abscess may be classified into primary or secondary [6]. Primary PA occurs as a result of haematogenous or lymphatic spread from an unknown site where as secondary psoas abscess is found in patients with infectious focus in skeletal, gastrointestinal,

urinary tract or those with a history of prior abdominal surgeries or instrumentation [6, 7]. Majority of psoas abscesses are secondary in nature and primary are less common [6, 7]. Primary PA is more common in immunocompromised patients, diabetics, malignancies, patients on steroids, intravenous drug abusers and history of trauma. Patients with HIV are at increased risk of primary PA [4, 6-8].

In our case also, the patient was a known seropositive case. Also, the mean age of patients with psoas abscess was 40 according to Tarhan *et al*. [6] and 33-69 years according to a study by Lopez *et al*. [7]. In our case also, the patient's age was 46 years. In a study conducted by Van den Berge *et al* and Ricci *et al*, majority of primary abscesses occurred in developing nations [8, 9] with predominance in younger patients [9]. Hence in our case, where the patient was an Indian adult female with known HIV positive status, without history of surgeries, intervention, urinary tract infection in the past, clinical and laboratory findings as mentioned above, the psoas abscess was primary in nature. Aerobic bacterial culture of the pus aspirated from abscess showed growth of *S. intermedius* and *E. coli, S. intermedius* belongs to *S. anginosus* group (which belongs to *Viridans Streptococci* group) along with *S. anginosus* and *S. subspconsellatus* [2]. Organisms belonging to *S. anginosus* group have micro-aerobic or anaerobic growth requirements, form tiny, non-haemolytic or beta haemolytic colonies [2, 3]. Gram positive isolate in our case was also tiny and non-haemolytic.In his study, Jacobs *et al.* found that most of his *S. intermedius* strains were non-haemolytic [5]. *S. intermedius* forms part of normal flora of mouth and upper respiratory tract, but cause abscesses in various organs like pneumonia, endocarditis, brain and intra–abdominal abscesses, skin, bone, soft tissue [3,5] but are exceptionally involved in causing muscular abscess [3].

According to Jacobs *et al.*, *S. intermedius* was more frequently obtained from infections and abscesses amongst *S. anginosus* group members [5]. In different studies by Shields *et al*., Tarhan *et al*., Lopez *et al*. and Santaella *et al*., commonest organism causing primary iliopsoas abscess is *S. aureus* [4, 6, 7, 10]. According to Berge *et al*, cause of primary psoas abscess is *S. aureus* in 88% of cases, *Streptococci* in 5% and *E. coli* in 3% cases [8]. Eighty eight percent of primary psoas abscesses are caused by *S. aureus*, 4.9% by *Streptococcus* species and 2.8% by *E. coli* according to Bagul *et al*. [11]. Occurrence of PA by *S. milleri* is very rare [11]. Mixed cultures are seen in secondary PA according to Berge *et al*. [8]. Though, primary PA generally involves a single organism in a study by Lopez *et al*. reported four out of 21 cases of primary PA with a polymicrobial infection [7]. Jacobs *et al*. reported that in 62.4% of abscesses caused by this *S. anginosus* group, accompanying flora was present, commonest being *E. coli* [5]. A similar finding of two organisms in primary PA was seen in our case. In HIV infection, due to depression in immunity, the individual is exposed to many opportunistic organisms causing diseases but the iliopsoas muscle compartment is rarely affected by pathologic conditions according to Ose-Emenim IB and colleague and they reported a case of a young adult female with HIV positive status presented with psoas abscess caused by *Streptococcus* [12]. This case is very similar and comparable to our case. In iliopsoas abscess in patients with HIV, *M. tuberculosis* followed by *S. aureus* is most common organisms [4, 7] and rarely

E. coli [7]. In a study by Otedo *et al.*, the commonest cause of bacterial pyomyositis in HIV positive or negative patients is *S. aureus* but few cases are by Streptococcus, Gram negative organisms, anaerobes, *Mycobacterium tuberculosis* and *Mycobacterium avium intracellulare* complex [13]. Anaerobic bacterial culture was not asked probably because there were no signs like presence of crepitus and the pus was not foul smelling. In this case there was a strong suspicion of involvement of Mycobacteria as she was a known seropositive patient, had a past history of tuberculoma and also because *Mycobacterium tuberculosis* (MTB) is commonly found in such cases [4, 7]. But XpertMB/Rif test was negative and mycobacterial culture of the pus did not show growth of typical or atypical Mycobacteria. The blood sample received for aerobic bacterial culture from the patient did not show growth. Abscess culture was the commonest microbiologic procedure for establishing a microbiological diagnosis where as blood culture was positive in less than half such cases and blood cultures gave higher rates of positivity in abscesses of skeletal origin according to a study by Lopez *et al*. [7]. In our case, it may appear that it is a secondary psoas abscess with mixed growth but there was no such history indicating it. Hence, in our case, the psoas abscess in an adult female HIV positive patient was primary in origin as primary PA is common in HIV positive patients and also as there was no known secondary cause, with more than one causative organism, *S. intermedius* accompanied by *E. coli* which is quiet rare and needs to be reported. Regarding its treatment, percutaneous drainage along with prolonged antibiotic therapy of at least two to three weeks after subsiding of fever or after drainage, is most suitable as it increases recovery rate and decreases length of hospitalisation [4, 6, 8, 12, 14]. In our case also, the abscess was drained percutaneously and the patient was given antibiotics for three weeks in all due to which her abscess has resolved which was seen on follow-up.

Conclusion:

We would like to emphasize the importance of bacterial confirmation of causative microorganism along with timely diagnosis (by USG and CT scan) in an uncommon entity like psoas abscess and highlight the fact that though primary in nature, a possibility of polymicrobial infection by rare organisms does exist.

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