

Obturator internus and externus muscle abscess caused by methicillin-resistant *Staphylococcus aureus* in a 6-year-old boy: A case report

SAGE Open Medical Case Reports
Volume 9: 1–4
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DOI: 10.1177/2050313X211044340
journals.sagepub.com/home/sco



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Abstract

Obturator abscess is a rare condition in children which usually occurs commonly in tropical countries. Because of its rarity, vague symptomatology and a lack of focus about this condition, the diagnosis of obturator abscess is commonly delayed or missed. Hence, physicians should be familiar with this condition and have a high index of suspicion when a patient presents with fever, pain in the thigh, hip or abdomen and a limp on the affected side which are considered as the classic clinical triad of obturator abscess. Herein, we present a 6-year-old previously healthy Russian boy who was on holiday in Sri Lanka. He presented on the third day of the fever associated with pain in the right thigh and abdomen. This is the first reported case of an obturator externus muscle abscess due to methicillin-resistant *Staphylococcus aureus* in a European boy visiting a tropical country.

Keywords

Infectious diseases, surgery, radiology, obturator internus, obturator externus, methicillin-resistant *Staphylococcus aureus*, abscess

Date received: 17 May 2021; accepted: 18 August 2021

Introduction

Pyomyositis is defined as a bacterial infection of the skeletal muscle that usually involves large muscle groups, such as the quadriceps or the glutei. Initial localized inflammation associated with pyomyositis could be complicated with abscess formation and disseminated sepsis.¹ Children with obturator abscess commonly present with fever, hip, thigh or abdominal pain associated with a limp on the affected side. The obturator abscess is often misdiagnosed as it mimics more common pathologies like septic arthritis of the hip, transient synovitis of the hip, acute retro-caecal appendicitis or a ruptured appendix, osteomyelitis, juvenile rheumatoid arthritis or a psoas abscess.² These patients should be approached with a high index of suspicion.

Case presentation

A 6-year-old previously healthy boy from Russia visiting Sri Lanka, presented with pyrexia, abdominal pain, right-sided

hip and thigh pain. He had restricted hip movements on the right side with ipsilateral weight-bearing difficulty. A right-sided limp had worsened since Day 1 of illness. He was brought into consultation on the fourth day of the fever due to deterioration of his condition after two visits to the outpatients' department on Days 1 and 2 of the illness. He was given symptomatic treatment including paracetamol and ibuprofen.

He had fever (39.1°C), tachycardia (110 beats/min), blood pressure of 92/60 mmHg and respiratory rate of 26 breaths/min, with an oxygen saturation of 99% in the room

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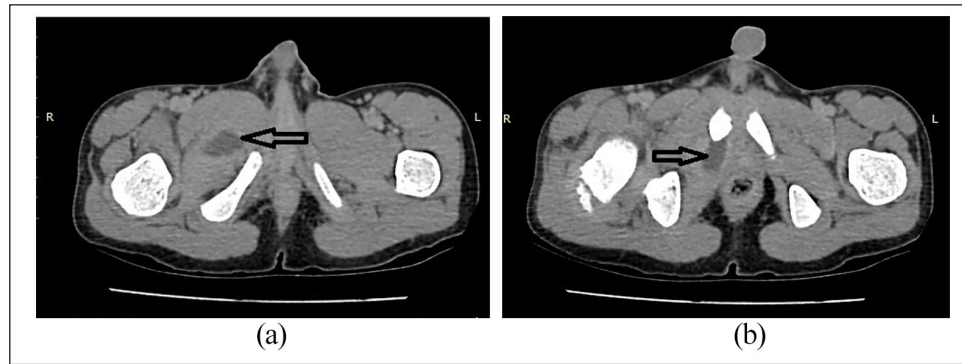


Figure 1. Component of abscess in right obturator externus and internus. Post-contrast axial sections of CT scan reveal focal fluid collections within R/obturator externus muscle ((a), marked by the arrow) and R/obturator internus muscle ((b), marked by the arrow) with density of HU 21. Both muscles appear bulky.

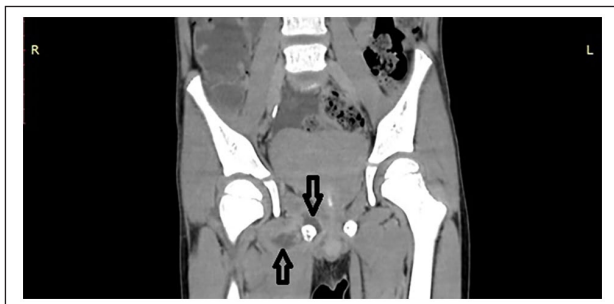


Figure 2. Post-contrast coronal section of CT scan reveals fluid components within obturator internus and externus muscles on R/side (marked by the arrows).

ambience. He appeared to be acutely ill and was in pain. Palpation of the lower abdomen revealed tenderness and guarding. His right hip was kept flexed and externally rotated, and the movements in all directions were restricted.

Laboratory investigations revealed a white cell count of $5500/\text{mm}^3$ ($5000\text{--}13,000/\text{mm}^3$) with a neutrophilia (85%) (30%–53%); a haemoglobin 12.3 g/dL (11–14 g/dL) and a platelet count of $184,000/\text{mm}^3$ ($150,000\text{--}450,000/\text{mm}^3$). The C-reactive protein level was 110.8 g/L (<5 g/L). Repeated blood and urine cultures were negative.

Ultrasound scan did not reveal any features such as echogenic debris suggestive of septic arthritis of hip or an appendicular pathology.

The computed tomography (CT) scan of the abdomen, pelvis and proximal thigh revealed a focal collection of fluid within the right obturator externus muscles amounting to 1.8 mL ($1.3 \times 2.0 \times 1.4$ cm) (Figure 1(a)) and right obturator internus amounting to 1.2 mL ($1.0 \times 1.9 \times 1.2$ cm) (Figure 1(b)) at the level of the ischiopubic ramus on the right side interconnected with each other, confirming abscess formation within the two muscles (Figure 2).

An ultrasound-guided aspiration was performed, and 4 mL of pus was drained. The pus culture yielded methicillin-resistant *Staphylococcus aureus* (MRSA) sensitive to

vancomycin, clindamycin and linezolid. The organism was resistant to cloxacillin, erythromycin, ciprofloxacin and fusidic acid. He was commenced on intravenous clindamycin due to the lack of facilities to monitor the vancomycin levels and due to the lesser nephrotoxicity compared to vancomycin. The blood cultures that are usually performed in our setup do not yield anaerobic organisms. Clindamycin has better anaerobic cover when compared with vancomycin.

Patient clinically improved, fever settling 1 day after the commencement of treatment and the local tenderness and limp remitting 2 days later. The C-reactive protein level dropped to 24 mg/L. He was discharged on the fourth day and prescribed oral clindamycin for 4 weeks. He remained asymptomatic and exhibited no obvious sequelae 6 months later.

Discussion

Obturator internus and externus muscle abscess is an exceptionally rare condition in the paediatric population. It presents with fever, pain in the abdomen and hip with limited weight-bearing ability of the affected lower limb. Initially, this was considered as a disease of the tropics. However, it is now identified to be more frequent among subjects across all ages in the temperate climates as well.³ The non-specific nature of its presentation, investigation results and above all the lack of familiarity about this condition among the treating physicians often confounds the diagnosis.

The presence of fever, pain and tenderness of the hip with a limp on the affected side are commonly regarded as septic arthritis of the hip. However, in the case of negative hip ultrasound in a child with a limp with these symptoms, the possibility of obturator abscess should be considered higher up in the differential diagnosis.⁴ External rotation of the hip causes more pain than the internal rotation with the pain being present in the extreme flexion of the hip.⁵

The aetiology of obturator abscess is not yet clearly determined but is usually due to a transient bacteraemia or following trauma.⁶ Secondary obturator abscess occurs as a result of either pelvic osteomyelitis or intra-abdominal pathology.⁷

Its rarity stems from the high degree of resistance of the striated muscle to the episodes of bacteraemia.⁸ The commonest causative organism of obturator abscess is methicillin-sensitive *S. aureus* (90% of cases in the tropics and 70% in non-tropical countries) followed by *Streptococcus pyogenes*. More unusual organisms including *Enterococcus faecalis*, *Neisseria gonorrhoeae* and *Klebsiella* sp. too have been reported in the literature.^{6,9}

Laboratory investigations usually reveal high C-reactive protein levels and erythrocyte sedimentation rate. C-reactive protein is the most sensitive parameter that will help the clinician to determine the course of the disease and the response to the treatment.¹ White blood cell count might be normal at the onset of the disease. Blood cultures are usually not helpful in the diagnosis as they are commonly negative.¹⁰

Plain radiography and ultrasound scan of the pelvis and hip will help to rule out some of the differentials. A negative ultrasound scan of the hip and pelvis with biochemical features of sepsis is an indication to perform a CT or a magnetic resonance imaging (MRI).¹¹

In this case, the 6-year-old boy initially presented with pyrexia (39.1°C), and abdominal pain which mimicked the clinical features of acute appendicitis. There were restricted movements of the right hip which favoured the possibility of septic arthritis of right hip. Although local trauma to the affected muscle resulting in inflammation or haematoma was thought to be the main underlying reason, our patient did not have an identifiable cause. Symptoms appeared about 10 days after arriving in Sri Lanka although the symptoms for obturator abscess commonly occur after several weeks or sometimes months after the initial injury.¹² Haematological investigations were suggestive of severe bacterial infection with a high leucocytosis with neutrophil predominance and a high C-reactive protein level. Since the ultrasound scan findings were not suggestive of acute appendicitis or septic arthritis of the hip, the possibility of obturator abscess was considered. The diagnosis was confirmed with the CT scan findings of enlargement and decreased attenuation of the involved muscles, fat stranding in surrounding tissues. The abscess appears as an intramuscular fluid collection with peripheral rim enhancement. The differential diagnoses for the above radiological findings such as viral myositis, leptospirosis, osteomyelitis, cellulitis, necrotizing fasciitis, clostridial myonecrosis, septic arthritis and deep vein thrombosis were excluded with the history, clinical and biochemical findings.

He required an ultrasound-guided aspiration of the pus as there was a collection following which he had a rapid recovery with intravenous followed by oral clindamycin with no long-term sequelae.

If an obturator abscess is detected in the pre-suppurative phase, empirical antibiotics against *S. aureus* will be adequate in most cases which will be evident by a rapid resolution of the clinical and biochemical parameters.⁸ But the latter stages require either surgical drainage or percutaneous catheter drainage under ultra sound or CT guidance and antibiotic therapy.^{13–15}

Conclusion

In conclusion, we recommend that obturator abscess should be strongly considered in a patient who presents with fever, hip pain and limp specially with high inflammatory markers and a negative hip ultra sound. Confirmation should be done ideally with an MRI or a CT scan. Intravenous antibiotics should be commenced empirically against *S. aureus* and consider drainage of the abscess either through an ultra sound or CT-guided percutaneous catheter or surgically.

Acknowledgements

The authors thanks patient and their parents for granting consent to publish data.

Author contributions

M.H.A.D.D.S. provided clinical information, conceptualized and designed the study, contributed to significant intellectual content, critically reviewed the manuscript, drafted the initial manuscript, reviewed and revised the manuscript and contributed to the clinical management and writing of the manuscript. C.R.K. provided clinical information, important interpretations of the data and reviewed the manuscript. J.L. and B.D. provided clinical information for the case study and reviewed the manuscript. B.D. and C.R.K. were the radiologists responsible for the radiological diagnosis and interventions. J.L. was the surgeon responsible for treating the patient. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

Availability of data and materials

There are no more case-specific data that could be shared.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Informed consent

Written informed consent was obtained from the patient's parents for their anonymized information to be published in this article. Written informed consent was obtained from the parents of the child for publication of the case report and any accompanying images.

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