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Obturator internus muscle abscess caused by methicillin-resistant *Staphylococcus aureus* in an adult: A case report

Akinori Maeda, Isaku Saku*, Shotaro Kanda, Kazuo Saita, Toru Akiyama

Department of Orthopeadic Surgery, Saitama Medical Center, Jichi Medical University, Saitama, Japan

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ABSTRACT

INTRODUCTION: Obturator internus muscle (OIM) abscess is a rare condition, usually affecting children after trauma or muscular effort. Blood cultures always yield positive findings, with Staphylococcus aureus being the most common culprit. There are few reports in adults.
PRESENTATION OF CASE: We report a case of OIM abscess in an adult. A 24-year-old male was admitted to our hospital because of right hip pain and fever. He was diagnosed with OIM abscess, and methicillin-resistant *Staphylococcus aureus* (MRSA) was detected on bacterial examination. The patient was successfully treated with a surgical drainage procedure and antibiotics.
DISCUSSION: There are only five reported cases of OIM abscess in adults. The patient had no history of recent hip trauma, but had intractable acronyx of the right great toe, which was being treated for 2 years. MRSA was also detected from cultures of samples obtained from the toe. A toe infection can lead to bacteremia.
CONCLUSION: In conclusion, we report the first case of OIM abscess in an adult caused by MRSA. Surgical drainage, debridement, and systemic antibiotic treatment were administered, resulting in a successful outcome.

1. Introduction

Obturator internus muscle (OIM) abscess is a rare condition, usually affecting children after trauma or muscular effort [1,2,7,8]. Primary infection of muscles occurs in many parts of Africa and the South Pacific, often referred to as 'tropical disease'. Although rare, an increasing number of cases have occurred in temperate climates [11]. Because of its rarity, diagnosis is often delayed, leading to severe complications and prolonged therapy [5,6]. In past reports of OIM abscess, there are only five adult cases. To the best of our knowledge, we report the first case of OIM abscess in an adult caused by methicillin-resistant *Staphylococcus aureus* (MRSA). This case report has been reported in line with the SCARE criteria [13].

2. Presentation of case

A 24-year-old Japanese man experienced pain in the right hip. One week later, the pain worsened, and he presented to his primary care doctor, who diagnosed him with lumbar disease. One week later, the patient was febrile, with a temperature of 39.0 °C. Because of the increasing severity of the right hip pain, he could not bear weight on his right leg. OIM abscess was suspected based on magnetic resonance image (MRI) findings, and he was referred to our hospital.

He presented with intractable acronyx of the right great toe, for which he had been undergoing treatment for 2 years. He was otherwise healthy, with no history of foreign travel and was not taking any medication. On physical examination, his temperature was 37.2 °C. His right hip was held in flexion, abduction, and external rotation. There was some limitation of movement of the right hip (90° flexion, 0° internal rotation, and 40° external rotation), with pain at the limits of movement. There was no erythema or swelling.

Laboratory investigation revealed a white blood cell count of 14,930/mm^3 and C-reactive protein level of 7.95 mg/dL, indicating an acute infection. A radiograph of both the hips in anterior-posterior view was unremarkable. An MRI scan revealed a mass in the right OIM, extending through the obturator foramen to the right external obturator muscle. The right hip joint and femur were not involved (Fig. 1 and 2).

We performed an open biopsy drainage surgery by a posterior approach to the hip. Pus formation was seen around the obturator muscle. The wound was cleansed with Ringer's solution. Because OIM abscess was diagnosed, intravenous antibiotic (cephazolin, CEZ) treatment was initiated immediately after the surgery. The

* Corresponding author at: Department of Orthopaedic Surgery, Saitama Medical Center,Jichi Medical University, 1-847Amanuma, Omiya-ku,Saitama,Saitama, Japan.
E-mail addresses: m03082am@jichi.ac.jp (A. Maeda), sakuisaku@jichi.ac.jp (I. Saku), panda714@hotmail.co.jp (S. Kanda), saita@saitama-med.ac.jp (K. Saita), toruakiyama827@jichi.ac.jp (T. Akiyama).

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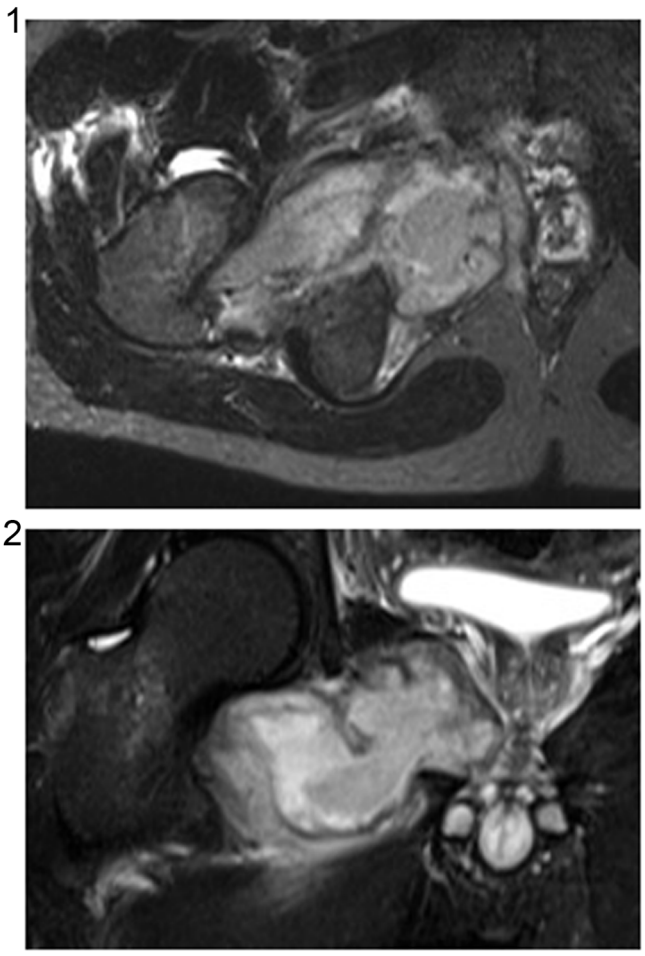

Figs. 1 and 2. MRI scan revealed a mass in the right obturator internus muscle.

Figs. 3 and 4. A follow-up MRI performed 5 months after onset of the disease showed resolution of the obturator internus muscle abscess.

patient was allowed to walk without any restriction on weight bearing on the operated extremity, on the first day after surgery.

The patient's temperature subsided with gradual improvement of the hip pain post-operatively. MRSA was isolated from intra-operative bacterial culture, and the antibiotic was changed to vancomycin (VCM). However, symptoms of allergy (drug eruptions) appeared after administration of VCM; hence, VCM was replaced with daptomycin (DAP). No adverse effects of DAP administration were noted.

A contrast-enhanced computed tomography (CT) scan performed 1-month post-surgery showed decreased abscess size in the OIM. Therefore, the patient was switched to oral antibiotic (minocycline, MINO) and discharged home. He took oral antibiotics for an additional 4 weeks after discharge.

A follow-up MRI scan performed 5 months after disease onset showed resolution of the OIM abscess (Figs. 3 and 4). The patient was followed up in the outpatient clinic for 3 years without recurrence. At the latest follow up, the patient was fully active and had full range of motion of the right hip. MRSA was also detected in bacterial culture of sanmples taken from his intractable acronyx of the right great toe, after OIM drainage surgery.

3. Discussion

OIM abscess is rare in adults; 80% of OIM abscess cases occur in adolescents [1,2]. Primary infection of muscles occurs in many parts of Africa and the South Pacific, often referred to as 'tropical disease'. Although rare, an increasing number of cases have occurred in temperate climates [11].

Patients with OIM abscess present with symptoms such as fever, hip pain, limping gait, and limitation in hip range of motion. At the time of physical examination, there is often limitation in range of motion when the hip is flexed, abducted, and externally rotated.

Although this presentation suggests the diagnosis of septic arthritis, other entities like pelvic osteomyelitis, retroperitoneal abscess, psoas muscle abscess, and OIM abscesses should be considered [3,4].

Because of its rarity and often non-specific symptoms, OIM abscess is unlikely to be considered during initial diagnosis. Delay in diagnosis may result in severe complications, such as extension into and destruction of an adjacent joint, compartment syndrome, solid-organ impairment, sepsis, and even death [5,6].

Initiating factors of OIM abscess are often a history of minor trauma, such as strenuous exercise, and a potential source of bacteremia [1]. Local trauma has been documented in an estimated 21% to 66% of reported cases [7]. Local trauma to the muscle that results in inflammation or hematoma is thought to be important for the formation of OIM abscess, in addition to a concurrent transient episode of bacteremia [8].

S. aureus is the most common pathogen of OIM abscess (70%–81% of cases).

In this case, we performed open surgical drainage before treatment with antibiotics alone in order to make a definite diagnosis of OIM abscess. However, in the literature, initial therapy is most often involves antibiotics – a semisynthetic penicillinase-resistant penicillin or a first-generation cephalosporin. An estimated 54%–67%

Table 1
Characteristics of previously reported cases of obturator internus muscle abscess in adults.

Case Number	Author	Age	Sex	Past history	Sport	Pathogen	Surgical drainage
1	Chatwani et al.	27	Female	–	–	*Escherichia coli*, Enterococcus	+
2.	King et al.	21	Male	–	football	*Staphylococcus aureus*	+
3	Mukhtyar and Bradlow	33	Male	–	rugby	*S. aureus*	–
4	Yaholom et al.	71	Male	diabetes mellitus	–	*Klebsiella pneumoniae*	+
5	Gibelin et al.	24	Male	–	soccer	*S. aureus*	+

of cases treated with antibiotics have successful outcomes without any surgical intervention. The length of antibiotic treatment has not been established, and range from 2 to 6 weeks depending on the clinical severity [1,2,7,8,9]. If the patient has persistence of fever and pain for more than 5–7 days despite antibiotic treatment, percutaneous or open surgical drainage should be considered [8,9]. However, it is often difficult to drain an OIM abscess because of its location medial to the lesser pelvis. Thus, early detection of OIM abscess is important.

In past reports of OIM abscess, only five cases of OIM abscess in adults have previously been reported (Table 1). Chatwani et al. first reported a case of a postpartum paravaginal hematoma caused by *Escherichia coli*/enterococcus [12]. King et al., Mukhtyar and Bradlow, and Gibelin et al. reported OIM in a patients with a history of recent hip trauma after playing football or rugby; *S. aureus* was the detected pathogen in these cases [2,10,11]. Yahalom et al. reported a case in a 71-year-old man with diabetes caused by a highly antibiotic-resistant *Klebsiella pneumoniae* [1].

To the best of our knowledge, this is the first case of OIM abscess in an adult caused by MRSA.

The patient had no history of a recent hip trauma such as strenuous exercise, but had intractable acronyx of the right great toe, which had been undergoing treatment for 2 years prior. On the toe, MRSA was also detected by bacterial culture after OIM drainage surgery. Infection in this site can lead to bacteremia.

4. Conclusion

In conclusion, we report the first case of OIM abscess in an adult, which was caused by MRSA. If a patient presents with symptoms such as fever, hip pain, limping gait, and limitation in hip range of motion, OIM abscess should be considered as a differential diagnosis. Because minor trauma and bacteremia may trigger OIM abscess, patient history should be obtained, and a general physical examination should be performed carefully.

Conflict of interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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Ethical approval

Institutional review board approval was exempt from our institution because all data were collected from clinical records and imaging systems for routine preoperative planning and follow up.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

AM wrote this paper. AM and TA attended the surgery, and all authors read this paper.

Guarantor

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