Case report of a 13-year-old boy with an obturator internus abscess and a need for re-imaging in this condition

Janka Fazekas, Bence Fazekas, Balazs Fazekas

ABSTRACT

Introduction: Obturator internus pyomyositis is a rare entity, which is becoming more common in temperate regions including the United Kingdom. Typically, it presents with a triad of hip pain, fever and an inability to weight-bear on the affected side mimicking other hip pathologies such as septic arthritis. Conclusive diagnosis relies on imaging modalities such as computed tomography (CT) scan and magnetic resonance imaging (MRI) scan. Since the first described case in literature in 1992, it has been common practice to treat the condition with intravenous antibiotics and incision and drainage if required, however, the most appropriate follow-up of this condition post-treatment has not been clearly defined. In particular, the role of post-treatment imaging to monitor the resolution of the abscess is not yet known.

Case Report: We present a case of a 13-year-old boy with an obturator internus abscess, whose diagnosis proved to be challenging due to an initial negative hip radiograph and ultrasound. Magnetic resonance imaging (MRI) played a key role in reaching the correct diagnosis. Follow-up imaging using MRI scan proved to be essential in the successful management of this case.

Conclusion: Our case report demonstrates the importance of post-treatment imaging and suggests that this may be a suitable method to ensure resolution of the abscess and to recognise known complications such as osteomyelitis.

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CASE REPORT

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Introduction: Obturator internus pyomyositis is a rare entity, which is becoming more common in temperate regions including the United Kingdom. Typically, it presents with a triad of hip pain, fever and an inability to weight-bear on the affected side mimicking other hip pathologies such as septic arthritis. Conclusive diagnosis relies on imaging modalities such as computed tomography (CT) scan and magnetic resonance imaging (MRI) scan. Since the first described case in literature in 1992, it has been common practice to treat the condition with intravenous antibiotics and incision and drainage if required, however, the most appropriate follow-up of this condition post-treatment has not been clearly defined. In particular, the role of post-treatment imaging to monitor the resolution of the abscess is not yet known. **Case Report:** We present a case of a 13-year-old boy with an obturator internus abscess, whose diagnosis proved to be challenging due to an initial negative hip radiograph and ultrasound. Magnetic resonance imaging (MRI) played a key role in reaching the correct diagnosis. **Follow-up imaging using MRI scan proved to be essential in the successful management of this case. Conclusion:** Our case

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Keywords: Obturator internus pyomyositis, Osteomyelitis, Post-treatment imaging, Hip pain

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INTRODUCTION

Limping in children can result from structural abnormalities, neuromuscular disorders or underlying infection. Of the many potential causes, a key diagnosis to exclude is septic arthritis of the hip, since a delay or a failure to recognize this condition would result in tissue destruction and a subsequent loss of function of the affected joint [1]. In this case report, we describe an unusual cause of limping in a child, namely an obturator internus abscess, which is often difficult to distinguish from septic arthritis of the hip. Furthermore, a literature review of previous such cases has been compiled, to help ascertain the best method for monitoring these post-treatment.

CASE REPORT

A 13-year-old Caucasian boy with no prior medical history presented to his general physician with a four-

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week complaint of left sided groin pain radiating down to the knees, swinging fever, anorexia and fatigue. His observations revealed, he was tachycardic with a pulse rate of 105 beats per minute and had a temperature of 37.6°C. On general inspection, he had impetigo affecting the lower side of his right lip.

Examination of the hip joint revealed no muscle wasting, skin changes or lumps; no temperature difference between the two thighs was observed and lymphadenopathy was absent. On deep palpation, the patient had marked tenderness in the left iliac fossa and hip pain exacerbated by passive internal rotation of the left hip. Active movements of the left hip were reduced due to pain but passive movements were pain free and tolerated. Examination of his external genitalia was unremarkable.

His blood profile revealed raised inflammatory markers (White blood cell count $16.3 \times 10^9/L$, erythrocyte sedimentation rate 91 mm/hr, C-reactive protein 182 mg/L) and hemoglobin of 116 g/L. His urinalysis was negative and his blood cultures showed no bacterial growth.

Radiographic and ultrasound imaging of the patient's hips were unremarkable (Figures 1 and 2). An MRI scan was carried out and demonstrated a left-sided obturator internus collection with adjacent osteomyelitis (Figure 3).

Following microbiology advice, he was administered a two-week-long combined antibiotic regimen of intravenous ceftriaxone (2.9 g once a day) and oral clindamycin (214 mg four times a day). After showing marked improvement the patient was discharged home with ambulatory care package. A repeat MRI scan nine days post-treatment, however, revealed no significant change in the size of the obturator internus abscess (6x2x3 cm) and showed cortical destruction of the acetabular bones. The patient underwent an open debridement and a wash-out of the obturator internus abscess, cultures of which grew *Staphylococcus aureus* fully sensitive to erythromycin, flucloxacillin and clarithromycin but resistant to penicillin. On microbiology advice the antibiotic regimen was continued for six weeks; over the subsequent weeks the patient made a complete recovery from his infection.

DISCUSSION

Pyomyositis a bacterial infection of muscle often leading to abscess formation is a condition that is currently very low down the list of differential diagnoses for a child presenting with a painful hip. However, recent case reports have concluded that the presence of a negative hip ultrasound in a limping child should raise the suspicion of an obturator internus abscess [2]. The most common pathogen responsible for obturator internus abscesses is *Staphylococcus aureus* (thought to account for 90% of cases), but more unusual organisms including *Enterococcus faecalis*, *Neisseria gonorrhoea* and *Klebsiella* have also been reported in literature [3].

Figure 1: Anteroposterior hip radiograph of the patient which was reported as normal

Figure 2: Ultrasound scan of patient's left hip showing no hip joint effusion

The MRI scan is the preferred imaging modality for diagnosing pyomyositis and proves to be diagnostic in most cases. However, King et al. have reported a case of a 21-year-old footballer, in which the MRI imaging of the patient was misleading and led to a delay in diagnosing this rare condition. This report emphasised

Figure 3: Magnetic resonance imaging showing a left sided pelvic collection lateral to the external iliac vessels and increased signal within the left hemipelvis compatible with osteomyelitis.

the importance of a detailed history and examination [4]. Once the diagnosis is established, it is common practice to treat this rare condition initially conservatively with intravenous antibiotics, however, if this fails surgical or imaging-guided drainage of the abscess is advised. Notably, the American College of Radiologists report an 80% success rate for percutaneous abscess drainage in adults, with less than a 5% chance of abscess recurrence in the pediatric population [5].

To our knowledge, there are at present no clear guidelines on the need for re-imaging after having established the diagnosis of an obturator internus abscess to assess the success of the treatment given. Indications for re-scanning in the literature are persistent fever despite intravenous antibiotics, continuing pain and persistently raised inflammatory markers, however these indications were absent in our case report. The clear benefits of repeat imaging have been documented by Mukhtyar et al., where having only single imaging would have missed the changes resulting in bilateral obturator muscle involvement [6].

A literature search of 28 case reports of obturator internus (OI) abscesses revealed that in only 11 of these cases were follow-up imaging findings documented (Table 1). The imaging modalities used included computed tomography ($n=5$), MRI scan ($n=5$) and hip radiographs ($n=1$). Of the cases that did report re-imaging findings, repeat imaging was carried out between four days to four

Table 1: Compilation of 28 obturator internus abscess case reports from the literature. Eleven cases documented follow-up imaging post diagnosis; 8 showing complete resolution of the abscess, 2 showed persistence and 1 case showed osteomyelitis.

Authors who reported case	Date	Method of Diagnosis	Imaging Check-up done?	Outcome of re-imaging
Orlicek et al.	1985	CT	✓	Hip radiograph 14 days after showed no bony abnormalities
White et al	1991	CT	×	
Chatwani et al.	1992	CT	×	
Ellen Snook et al.	1993	99 mTc CT	×	
Kader Souid et al.	1993	CT+MRI	✓	Repeat MRI scan after 1 month showed a normal right IOM
Orlicek et al.	1995	MRI	×	
N. Godfroid	1995	CT	✓	Repeat CT scan 14 days after showed a decrease in size, CT 3 months later showed complete resolution
Howell et al.	1997	MRI	×	
Orlicek et al.	1998	CT	×	
Orlicek et al.	1998	CT	✓	Repeat CT scan 4 days after showed decrease in size of OIM abscess, 14 days following that a CT scan showed complete resolution but showed evidence of osteomyelitis
Viani et al.	1999	CT	×	
Viani et al.	1999	CT	×	
Viani et al.	1999	CT	×	
Viani et al.	1999	CT+MRI	✓	Repeat CT scan after 19 days showed full resolution
King et al	2003	MRI	✓	Repeat MRI scan 4 months after diagnosis showed a little residual bone marrow oedema within the pubic symphysis and minor soft tissue changes in the obturator region

Table 1: (Continued)

Authors who reported case	Date	Method of Diagnosis	Imaging Check-up done?	Outcome of re-imaging
Breda et.al.	2004	MRI	×	Repeat MRI after three weeks showed collections measuring 6 x6x24 mm in the left obturator internus and 21x13x12 mm in the right adductors. A third MRI scan (performed 10 weeks after the start of treatment) showed inflammation of the symphysis pubis and adjacent pubic ramus but complete resolution of the obturator pyomyositis.
Mukhtyar et.al.	2005	MRI	✓	
Wong et. al	2006	MRI	✓	
Yahalom et.al.	2006	CT	✓	
Dimitrios et.al.	2009	99 mTc CT + MRI	×	Repeat MRI three weeks after intravenous antibiotics treatment showed that inflammation around the left obturator internus abscess had subsided
Duthie et.al	2009	MRI	×	
Duthie et.al	2009	MRI	×	
Scillia et.al	2010	CT+MRI	×	
McKenna et. al.	2012	MRI	×	Repeat CT scan showed a decrease in the size showed decreased muscular infiltration
Khoshhal et.al.	2013	MRI	×	
Soraganvi et. al.	2013	MRI	✓	
Chong et.al.	2014	MRI	×	
Gibelin et.al	2015	CT	✓	Repeat CT showed marked improvement of pelvic lesions

month following diagnosis (mean = 29 days); eight cases showed complete resolution of the abscess, two showed persistence of the abscess and one case report showed evidence of osteomyelitis.

Our case report demonstrates the importance of re-imaging, even in cases where considerable clinical improvement occurred in response to intravenous antibiotics. Our patient's second MRI scan was done nine days after the first one, demonstrated no change in the size of the obturator internus abscess and showed evidence of osteomyelitis. The results of the second scan had considerably altered the management plan for the patient, leading to the patient undergoing an open debridement of the obturator internus abscess.

Although re-imaging is a useful tool to monitor response to treatment, abscess recurrence has been demonstrated despite a repeat scan showing resolution of the infective process by Viani et al. [7]. The CT scan of the pelvis done 19 days after diagnosis showed full abscess resolution, nevertheless the patient was readmitted four months later with a gluteal abscess affecting the same side [8].

CONCLUSION

At present, there are no guidelines available on the requirement for follow up imaging in obturator internus

abscesses. Computer tomography is most common imaging technique used to monitor the adequacy of drainage, as well as the development of new abscesses. We recommend, based on our case report and review of literature, that follow up of treatment response with imaging, be it CT scan or MRI scan, is warranted.

Author Contributions

Janka Fazekas – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Bence Fazekas – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Balazs Fazekas – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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