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Case report

Abscess of the piriformis muscle in a 14-year old boy – a transrectal drainage method under transabdominal ultrasound guidance

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Abstract

Introduction: Sciatica is a common reason for a medical consultation throughout the population. Piriformis pyomyositis is a rare cause of these symptoms. Its probable etiology is transient bacteraemia co-existing temporarily with a muscle injury.

Aim: The aim of the study is to present a method for treating a piriformis muscle abscess with transabdominal ultrasound-guided transrectal drainage.

Case study: A 14-year old boy, previously healthy, was admitted with symptoms of sciatica that appeared after intense physical exertion. Laboratory tests revealed elevated inflammatory parameters and positive blood culture results indicating *Staphylococcus aureus*. Antibiotic therapy was implemented. MRI of the small pelvis revealed a forming abscess of the right piriformis muscle. On day 6 of the antibiotic therapy, in the absence of improvement, it was decided to perform transrectal drainage under ultrasound guidance. Clinical improvement was achieved, and the inflammatory parameters decreased.

Results and discussion: Co-existence of sciatica symptoms and signs of an inflammatory condition should prompt the consideration of piriformis pyomyositis. The mainstay of treatment for piriformis pyomyositis is antibiotic therapy. The abscess formation reduces its effectiveness, which necessitates surgical intervention. The authors present the application of transrectal drainage under transabdominal ultrasound guidance as the shortest route of abscess evacuation.

Conclusions: Transrectal drainage of piriformis pyomyositis is an effective and safe method. Concomitant use of ultrasound scans reduces the patient's exposure to ionising radiation. However, the widespread use of this method requires more in-depth research and broadened experience.

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1. INTRODUCTION

More than half of the adult population report to their doctor due to pain in the lumbar spine regions at some point in their lives.[1] Sciatica occurs with a lifetime prevalence of 12%–27%.[2] These symptoms are much less common in children and usually have a different etiology. Piriformis syndrome, or piriformis sciatica, is a set of symptoms typical of a condition of increased tension of the piriformis muscle and the pressure of this muscle on the sciatic nerve is one of the rarest causes of these symptoms.[3] It is estimated that of all sciatica episodes, piriformis syndrome occurs with a prevalence of 6%–36%.[2,4] One of the causes of piriformis syndrome is piriformis pyomyositis. Twenty-three cases of piriformis pyomyositis have been described to date in the English-language literature available to the study authors.[5]

Robinson has developed six criteria for diagnosing piriformis syndrome:[2]

(1) History of an injury in the sacro-lumbar and gluteal regions.
(2) Pain in the region of the sacroiliac joint, lesser sciatic foramen, and the piriformis muscle, generally radiating to the lower limb and causing difficulty in walking.
(3) A sudden exacerbation of pain caused by bending over or lifting heavy objects.
(4) A palpably accessible sausage-shaped mass, and tenderness to palpation above the piriformis muscle.
(5) A positive Lasègue's sign.
(6) Atrophy of the gluteal muscles determined by the duration of the condition.

2. AIM

The aim of the study is to present a method for treating an abscess of the piriformis muscle with transabdominal ultrasound-guided transrectal drainage.

3. CASE STUDY

A 14-year old boy, previously healthy, was admitted to the neurology department with symptoms of right-sided sciatica persisting for 2 days. The symptoms appeared after physical exertion, i.e. lifting heavy objects during vocational practice. On admission, the patient was in a grave but stable general condition, with logical verbal contact maintained. The patient suffered from severe pain in the lumbar region of the spine, which prevented mobility and radiated to the right buttock (a positive Lasègue's sign), the posterior surface of the right thigh, and to the right foot, with decreased sensation in this area.

A neurological examination revealed slightly impaired knee and Achilles tendon reflexes on the right side, asymmetrical nerve stretch test results on the same side, and marked tenderness to palpation in the projection of the sacral bone.

Laboratory test results showed elevated inflammatory parameters (CRP 25.43 mg/dL, procalcitonin 1.01 ng/mL, ESR 70 mm/h, WBC 10.7 × 10^3/mm^3), and signs of urinary tract inflammation in urinalysis: up to 4 leukocytes present in the field of view, numerous bacteria in the urine sediment, rather numerous squamous epithelia and positive nitrates.

Figure 1. Preoperative MRI. The arrows indicate inflammatory lesions in the piriformis muscle area. The lesions reach the intervertebral foramina S1/S2/S3 on the right side and penetrate into the pelvis, causing compression of the right iliac vessels and the mesorectal fascia, pushing the rectum to the left side.

Figure 2. Postoperative MRI. The arrow indicates the right piriformis muscle with signs of oedema, without fluid accumulation.

An urgent abdominal ultrasound scan and chest X-ray revealed no abnormalities.

The patient was febrile from the beginning of the 2nd day of hospitalisation. Antibiotic therapy with ceftriaxone i.v. was introduced. Urine cultures showed mixed bacterial flora in a significant titre, and blood cultures revealed methicillin-sensitive *Staphylococcus aureus*.

An echocardiographic examination result ruled out infective endocarditis.

The antibiotic therapy profile was expanded by introducing cloxacillin (at high doses of 4 × 1 g i.v. daily).

In order to identify the primary focus of infection, an MRI scan of the spinal cord, chest and pelvis with contrast was performed on day 3 of hospitalisation and revealed no abnormalities in the Th–S section of the spinal cord. However, the presence of right piriformis pyomyositis with coexisting inflammation of the right iliosacral joint was found, with the entire lesion dimensions of 75 × 35 mm in cross-section, in close proximity to the rectum (Figure 1).

The targeted antibiotic therapy was continued according to blood culture results. On day 5 of hospitalisation, due to the lack of clinical improvement and a continuous increase in the inflammatory parameters, a follow-up MRI scan was performed. As compared to the previous examination, there was a progression of the lesions and the abscess dimensions increased, with the entire lesion dimensions of 91 × 65 mm in cross-section.

After a surgical consultation, it was decided to treat the purulent lesions surgically.

The surgery was performed on day 6 of the patient's hospitalisation. During the surgery, under the guidance of transabdominal ultrasound, an abscess was localised by a per rectal examination. Using curved Pean 22 forceps, the abscess of the right piriformis muscle was then opened transrectally, thus enabling the outflow of purulent content. A culture was performed. A 20 Ch drain was inserted between the tool's jaws and left in the abscess site. The drain was then sutured to the skin of the anal region. The drainage was maintained until the purulent content outflow was stopped, i.e. three days. The pus culture result was consistent with the blood culture result and indicated methicillin-sensitive *S. aureus*. Intravenous targeted antibiotic therapy was maintained. Over the following days, the patient's clinical status gradually improved. A follow-up MRI scan performed after six days following the surgery revealed the right piriformis muscle with signs of oedema, with no fluid accumulation within the muscle. There has been a significant regression of lesions (Figure 2).

The inflammatory parameters decreased. The patient was discharged home after 21 days of hospitalisation. Following consultation with a clinical microbiologist, continued targeted oral antibiotic therapy was recommended. Trimethoprim and sulfamethoxazole were applied at a maximum dose (960 mg twice a day) for 3 weeks. At an outpatient follow-up visit, the patient reported significantly reduced pain. A follow-up MRI scan was scheduled after a 5-month observation period, where a significant regression of lesions was revealed in imaging examinations.

4. RESULTS AND DISCUSSION

Co-occurrence of the symptoms of piriformis sciatica and generalised inflammation should prompt the clinician to consider piriformis pyomyositis. Based on the presented case, the application of transabdominal ultrasound-guided transrectal drainage of a piriformis muscle abscess can be regarded as an effective and safe method.

One of Robinson's criteria is an injury in the lumbosacral region, which is clearly associated with an increased likelihood of piriformis pyomyositis. In the described case, a link can be found with intense physical exertion, i.e. a potential cause of the muscle injury, temporarily associated with the onset of symptoms, i.e. lifting heavy objects.

The presented case confirms the theory of etiology of piriformis pyomyositis caused by transient bacteraemia, most commonly of *S. aureus*, which is one of the most common etiological agent of bloodstream infections in children.[6] Less commonly, inflammation is caused by group A streptococci, *Escherichia coli*, *Proteus mirabilis* and *Brucella melitensis*.[7]

The phase of piriformis pyomyositis determines the treatment to be applied. It proceeds in three phases: (1) diffuse inflammation, (2) abscess formation, and (3) the septic phase.[8–10] In the first phase, the treatment of piriformis pyomyositis is based on the oral administration of antibiotics and nonsteroidal anti-inflammatory drugs.[10] Local administration of steroids should be avoided. If antibiotic therapy is not successful, it is likely that an abscess has formed, i.e. phase 2. In this situation, surgical intervention is required.[7,11] In the described case, imaging examinations and the patient's clinical condition indicated a local increase in the lesions. At the same time, the co-existence of staphylococcal bacteraemia required prolonged intravenous administration of antibiotics, which significantly prolonged the hospitalisation period.[12]

The applied surgical procedure was transrectal drainage of the abscess.

The authors have not found this type of management in a similar clinical situation in the English-language literature. The described methods for draining a piriform muscle abscess applied to date include transdermal drainage under CT guidance and an open surgical drainage.[1,5,13–15]

In the paediatric population, it is extremely important to minimise the effect of ionising radiation on the patient. For this reason, an ultrasound scan was used in the presented case. The application of this method to diagnose piriformis pyomyositis has its limitations due to the difficult penetration of ultrasound into the small pelvis, and no possibility to assess bone infiltration.[1] The literature provides examples of the drainage of the small pelvis abscesses under ultrasound guidance, both transrectal and transabdominal.[16,17] An ultrasound scan allows the safety of the procedure to be increased due to the possibility of real-time monitoring.

The use of transrectal transducers in children is limited due to their size, hence the decision to use a convex transducer in a suprapubic position. The acoustic window of the above imaging is the bladder. In view of the above, a point of discussion is to maintain the balance between the safety of the surgical procedure (i.e. avoiding damage to a filled bladder) and achieving satisfactory imaging. The authors propose a solution involving the preoperative insertion of a Foley catheter into the bladder and filling the bladder with a 0.9% NaCl solution to an intermediate level. Maintaining the catheter in the bladder enables the control of bladder filling during surgery and an assessment of possible urine bleeding.

5. CONCLUSIONS

Co-occurrence of sciatica and bacteraemia should be a diagnostic indication of an inflammatory process in the pelvic muscles adjacent to the sciatic nerve.

A correct early diagnosis and the implementation of proper treatment can protect the patient against severe complications.

The use of transrectal drainage appears to be a promising, minimally invasive method for treating piriformis pyomyositis.

Conflict of interest

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