

Presentation of Osteitis and Osteomyelitis Pubis as Acute Abdominal Pain

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Abstract

Osteitis pubis is the most common inflammatory condition of the pubic symphysis and may present as acute abdominal, pelvic, or groin pain. Osteomyelitis pubis can occur concurrently and spontaneously with osteitis pubis. Primary care physicians should consider these conditions in patients presenting with abdominal and pelvic pain. A thorough history, including type of physical activity, and a focused physical examination will be useful, and imaging modalities may be helpful. A biopsy and culture of the pubic symphysis will usually confirm the diagnosis. Treatment for osteitis pubis generally involves rest and anti-inflammatory medications. Failure with this conservative treatment should alert the physician to the possibility of osteomyelitis, which needs treatment with antibiotics. Prognosis for recovery is excellent with definitive diagnosis and treatment.

Introduction

Abdominal pain may be the presenting symptom in a wide range of diseases. This proposes a difficult challenge for the primary care physician. Acute pain often requires emergency surgical intervention, but unnecessary invasive procedures can be avoided when a good history is taken and thorough physical examination is conducted. Osteitis pubis is a common but often undiagnosed condition causing pain in the pubic area, groin, and lower rectus abdominal muscle. Osteomyelitis pubis is an infectious disease with clinical manifestations similar to those of osteitis pubis. These conditions are often overlooked as or masked by abdominal pain, which may lead to unnecessary tests and procedures. This case report discusses the onset of acute abdominal pain in an athlete with both osteomyelitis and osteitis pubis. It is important to recognize that both conditions may occur simultaneously in one patient. Failure to identify both disease processes could lead to inaccurate treatment and lifelong complications.

Case Presentation

A previously healthy male, age 17 years, presented with a three-day history of severe right lower quadrant abdominal pain. Initial workup findings, including those for a computed tomography scan of the abdomen and pelvis, were normal, and he was treated with nonsteroidal anti-inflammatory drugs (NSAIDs). He returned two days later with a fever of 38.3°C and worsening sharp, constant abdominal pain, radiating to the suprapubic area and exacerbated by movement. He was nauseated and anorectic and vomited nonbilious, nonbloody material once. His past medical history and a review of systems provided no new insights.

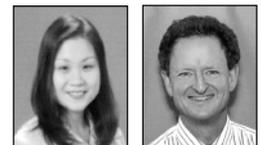
His abdomen was soft and nondistended, but he exhibited right lower quadrant tenderness with involuntary guarding and rebound tenderness. The psoas, obturator, and Rovsing's signs were positive; rectal examination findings were normal. The leukocyte count was 12,400 cells/mL, with a polymorphonuclear leukocytosis. Diagnostic laparoscopy showed no definitive intra-abdominal pathology, although a long, mildly engorged retroperitoneal appendix was removed; the pathologist found no inflammation.

Fever and worsening abdominal and suprapubic pain persisted, with pain radiating to both groins and preventing ambulation. Additional detailed history uncovered the information that the patient was an avid college soccer and tennis player and had participated in a soccer tournament the previous week. Examination now showed tenderness in the right lower quadrant and suprapubic and bilateral groin areas, tenderness of the pubic symphysis, and worsening pain with abduction of either hip. He developed bilateral inguinal lymphadenopathy, with no evident skin lesion. He had negative findings on blood tests including total protein, albumin, liver tests, complement components 3 and 4, creatine kinase, aldolase, beta₂-microglobulin, anti-DNA, and antinuclear antibody panel. His erythrocyte sedi-

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mentation rate (ESR) was 109 mm/h and C-reactive protein (CRP) level was 11.6 mg/dL; his leukocyte count remained elevated.

A pelvic radiograph showed slight deformity of the right suprapubic ramus at the level of the pubic symphysis, with irregularity of the iliac wing at the anterior iliac spine region. A ^{99m}technetium methyl diphosphonate bone scan showed increased radiotracer activity in the left superior pubic ramus, left anterior iliac crest, and right posterior iliac crest. A pelvic magnetic resonance imaging (MRI) scan revealed multiple enlarged right inguinal lymph nodes and an increased signal in the right inferior pubic ramus and right ilium bone marrow, with muscular changes. These findings were consistent with osteomyelitis and osteitis pubis. It was decided that a confirmatory pubic biopsy was not needed.

The patient was treated with intravenous cefazolin, ibuprofen, and bed rest. Over a week his condition improved markedly; he became afebrile and he was able to ambulate with assistance. His white blood cell count normalized; his ESR and CRP level were descending. He was discharged to complete a six-week antibiotic regimen via a peripherally inserted central catheter, plus ibuprofen and physical therapy. His ESR and CRP level normalized, but he was not completely asymptomatic until three months later, at which time he returned to his normal soccer and tennis training.

Discussion Background

Edwin Beer first described osteitis pubis in 1924 in patients undergoing suprapubic surgery.¹ It is the most common inflammatory disease of the pubic symphysis. It can be seen in any patient population but is more prevalent in men ages 30 to 49 years.² Although the precise etiology of osteitis pubis remains unknown, trauma during surgery or childbirth is responsible for most cases. Infection seems to be a predisposing factor.^{3,4} Biopsies of the pubic symphysis and adjacent bony areas show signs of subacute and chronic inflammation involving the periosteum, bone, and cartilage.⁴

Osteomyelitis pubis is often misdiagnosed as osteitis pubis, until conservative treatment for osteitis pubis fails.⁵ Risk factors for osteomyelitis pubis include female incontinence surgery, sports injury, pelvic malignancy, and intravenous drug use.⁶ Often there is inoculation during gynecologic or urologic surgery. However, other cases of osteomyelitis pubis inexplica-

bly follow seemingly normal spontaneous vaginal delivery or, as in the patient described here, athletic activity.⁷⁻⁹ Causative organisms differ according to risk factors. Patients with recent pelvic surgery usually have polymicrobial infection, involving fecal flora. *Staphylococcus aureus* is the major cause among athletes, whereas *pseudomonas aeruginosa* infection is the predominant pathogen in intravenous drug users.⁶

The remainder of this discussion focuses on occurrence of osteitis and osteomyelitis pubis in the athlete.

Anatomy and Pathomechanics

The pubic symphysis is a rigid, fibrocartilaginous joint between the pubic rami. The abdominal muscles, consisting of the rectus abdominus and external and internal oblique muscles, attach distally to the inguinal ligament, conjoined tendon, and pubic symphysis. The adductor muscles, consisting of the pectineus, adductor longus, adductor brevis, adductor magnus, and gracilis, arise from the superior and inferior rami of the pubis.¹⁰ These two muscle groups act antagonistically to stabilize the symphysis. Any muscle imbalances between the abdominal and hip adductor muscles may cause osteitis pubis.¹¹

Sprinting, cutting, and kicking activities involving jumping, twisting, or turning motions cause microtrauma and shear stress across the pubic symphysis, resulting in inflammation. These repetitive movements occur in running, soccer, tennis, ice hockey, and football, but any active person may present with osteitis pubis. Thus it must be considered in any patient with groin, hip, or abdominal pain.¹² Osteomyelitis pubis, a bacterial infection of the pubic symphysis or adjacent bone also has been reported to occur spontaneously in athletes.¹³

Clinical Findings and Diagnosis

A detailed medical history, including the actual motions the patient repeats during sports activity and a familiarity with the possible mechanisms of injury, can lead the physician to a more accurate diagnosis. Thorough examination of the groin, abdomen, hips, spine, and lower extremities is crucial.¹⁴ Patients with osteitis pubis can present with vague unilateral or bilateral complaints of abdominal, pelvic, or groin pain. Usually insidious in nature, it can occasionally be acute, sharp, burning pain in athletes after prolonged activity. Use of the abdominal or adductor muscles (eg, running, pivoting, and kicking) exacerbates the pain. The patient may also report weakness or difficulty ambulating.

A waddling gait may be observed. On examination, hip motion will exacerbate pain, and its range can be

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restricted. The most obvious and specific finding is tenderness of the pubic bone, superior pubic rami, or inferior pubic rami.¹⁴

When osteitis pubis is associated with fever, lymphadenopathy, nausea, vomiting, and anorexia, one must consider the concurrent diagnosis of osteomyelitis pubis. These symptoms can be easily mistaken for those of acute appendicitis.

Laboratory data are not required for the diagnosis of either osteitis or osteomyelitis pubis. In the latter there may be an increased leukocyte cell count and an elevated sedimentation rate, similar to data found with acute abdominal pain.

Imaging

Pelvic radiographs may show irregular borders over the pubic symphysis and rami. Varying degrees of articular surface irregularity, erosion, sclerosis, and osteophyte formation may be present. These findings are not specific to osteitis pubis and may not be detectable early. Symphysography, injection of the symphyseal cleft with noniodine contrast, is used to view morphology and potentially provoke symptoms. This procedure can confirm osteitis pubis¹⁵ (Figure 1).

A ^{99m}technetium methyl diphosphonate bone scan may show increased uptake in the area of the pubic symphysis¹⁵ (Figure 2). However, scan findings may be negative.

MRI may show bone marrow edema in the pubic bones early in the course of osteitis pubis. The presence of fluid should raise suspicion for an underlying infection, such as osteomyelitis¹⁵ (Figure 3).

Distinguishing between osteitis and osteomyelitis pubis can be difficult with bone scans and MRI alone. Although a definitive diagnosis often requires biopsy and culture,⁶ a biopsy was not performed in the patient discussed here. Lack of improvement with rest and NSAIDs plus a good response to antibiotics confirmed the diagnosis of osteomyelitis pubis.

Management

Treatment of osteitis pubis aims to reduce inflammation with rest and oral NSAIDs. Ice or heat may provide additional symptomatic relief. Sometimes glucocorticoid medications may be needed. After pain and inflammation are alleviated, progressive physical therapy is recommended. Athletes are instructed to avoid any type of sporting activity that may exacerbate symptoms.

Although use of intra-articular glucocorticoid injections is controversial, such injection in athletes with acute symptoms (<2 weeks) has been reported to re-



Figure 1. Radiograph of the symphysis pubis demonstrating extensive erosive changes and widening of the joint space consistent with osteitis pubis.

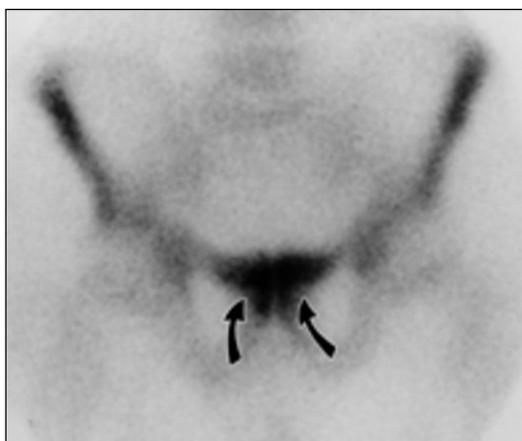


Figure 2. A bone scan enhanced with ^{99m}technetium methyl diphosphonate demonstrating increased radiocluide uptake on the medial margins of pubic bones.

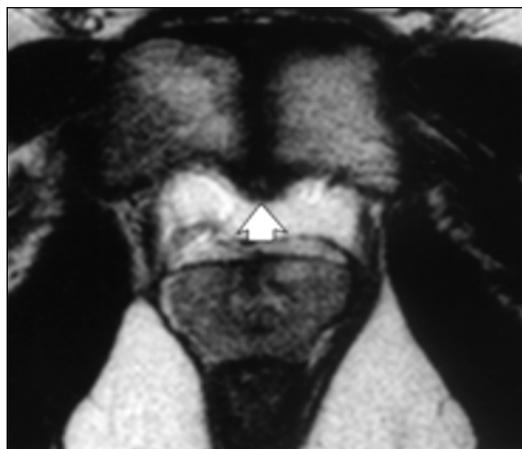


Figure 3. Axial T₂-weighted magnetic resonance image showing para-articular bone marrow edema and joint-surface irregularity.

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sult in a more rapid recovery.¹⁶ Thus, these injections may help athletes who need to return to competition within one to two weeks.

Surgery is rarely indicated and should be reserved for patients with severe pain or pubic instability nonresponsive to conservative therapy. Wedge resection of the symphysis can improve early symptoms but may lead to later posterior pelvic instability, requiring another surgical procedure.¹⁷ Video-assisted placement of an extraperitoneal retropubic synthetic mesh may support the damaged area and accelerate the rehabilitation process for osteitis pubis.¹⁸

Osteomyelitis pubis requires identification of the organism and treatment with the appropriate antibiotic. Initially antibiotics are given intravenously for two weeks, followed by oral antibiotics for at least six weeks or until the ESR is normalized. Surgical debridement may be required if there is no response to medical therapy.⁶ Rest, NSAIDs, and physical therapy are prescribed just as they are for osteitis pubis.

Prognosis

Osteitis pubis is a self-limiting condition, but time until full recovery in athletes ranges from three weeks to 32 months (average, nine months). There has been a reported 25% recurrence rate and a complete end to sports activities in 25% of those affected with osteitis pubis.¹³

Osteomyelitis pubis is not self-limiting, but when it is treated adequately with antibiotics, the prognosis for recovery is excellent. Data about the disease's recurrence rate in athletes are not available.

Conclusion

Abdominal pain can be a challenging problem with an extensive differential diagnosis. Acute pain can be misleading and can result in unnecessary invasive procedures. Osteitis pubis should be considered in the differential diagnosis when any patient complains of abdominal, pelvic, or groin pain. When pain occurs with fever, osteomyelitis should be suspected. To correctly diagnose these conditions, the primary care physician must maintain a high index of suspicion. When the conditions are recognized, specific conservative treatment can produce quick relief and good results. ♦

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