

## Osteitis pubis: a clinical challenge\*

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*Mechanical pain in the region of the groin poses an interesting and at times confusing clinical dilemma. This is especially true for osteitis pubis, an inflammatory condition affecting the symphysis pubis. Recently it has been recognized as a potential source of pain in athletes. In this report, we will review the typical presentation of osteitis pubis, including the clinical, examination and radiographic features of this condition. A proposed plan of management, based on previous work on avulsion injuries is presented. A case report has been included to illustrate the salient features.*

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**KEY WORDS:** osteitis pubis, symphysis pubis, pelvis, chiropractic, manipulation.

### Introduction

Mechanical pain in the region of the groin poses an interesting diagnostic and therapeutic challenge. This challenge is not only the result of the difficulty in the objective assessment of this region; but also in the interpretation of the painful lesions in its associated structures. One such painful lesion found in the symphysis pubis is osteitis pubis.

Osteitis pubis was first described by Beer in 1928, as a complication of urologic surgery.<sup>1</sup> It has recently, however, become recognized as a potential cause of groin pain amongst athletes.<sup>1,2</sup> In a retrospective study of the frequency of hip and pelvic pain among 204 athletes, Lloyd-Smith et al. found that osteitis pubis accounted for 6.3% of the conditions requiring treatment.<sup>2</sup> In another study, Harris and Murray reported radiographic abnormalities in the pelvis in 81% of soccer players complaining of groin pain. They also radiographed asymptomatic players and found that 76% had similar radiographic changes as described in those with pain. Detailed histories in this latter

*La douleur mécanique dans la région de l'aîne pose un dilemme clinique intéressant, et parfois embrouillant. Ceci est particulièrement vrai dans le cas de l'ostéite, pubienne, une inflammation s'attaquant à la symphyse pubienne. On a récemment découvert que celle-ci pouvait être une source de douleur chez les athlètes. Dans ce rapport, nous discuterons de la présentation typique de l'ostéite pubienne, ainsi que de l'examen clinique et des aspects radiographiques de cette condition. On y propose, en outre, un plan de gestion, fondé sur des travaux antérieurs concernant les lésions d'arrachement, et l'on y présente un cas d'espèce à titre d'illustration.*

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**MOTS CLÉS:** ostéite pubienne (osteitis pubis), symphyse pubienne (symphysis pubis), pelvis, chiropratique, manipulation.

group revealed that 54% had a past history of groin and/or lower abdominal pain. They concluded that excessive physical activity was likely to contribute to the observed pathologic changes about the pelvis.<sup>3</sup> Similar conclusions have also been made by others, who have reported such findings in athletes participating in events primarily involving kicking and running.<sup>1-7</sup>

Although relatively benign, osteitis pubis can be quite an irritating and frustrating condition to these athletes. Hence, it is the purpose of this paper to review the anatomical, clinical and radiographic aspects of osteitis pubis. A case report has been included to highlight the typical presentation.

### Case Report

A 38-year-old male chiropractor and competitive distance runner, presented with progressive, non-specific bilateral pelvic, groin and buttock pain and stiffness of about eight months duration. The onset of the pain was insidious and attributed to his long distance running. The pain was described as an episodic dull ache to sharp in character, localized about the groin with bilateral referral to the adductors, lower abdomen and perineum. The pain was aggravated by running (especially during and after runs), coughing and leg stretches. Temporary relief was attained by rest. He was otherwise in excellent health.

Past history revealed no significant injury during the last 24 years as a competitive runner. During the last 13 years he had

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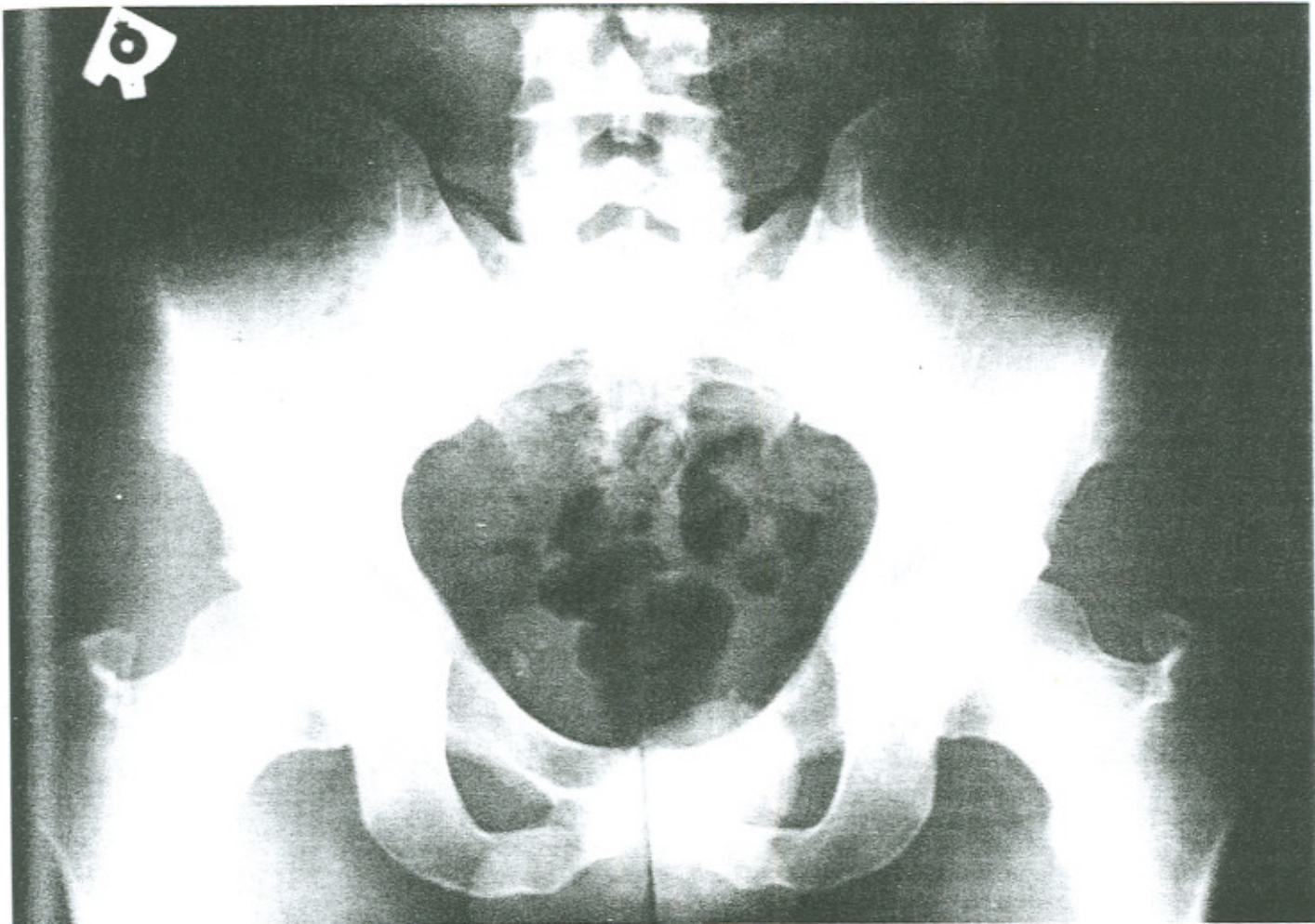


Figure 1 Anteroposterior view of the pelvis.

increased his mileage to approximately 50 miles per week, running primarily on asphalt surfaces. His training program included long runs of about 20 miles, as well as speed workouts once or twice a week, depending on the season and/or race preparation. Stretching was usually done following a run or in the evening.

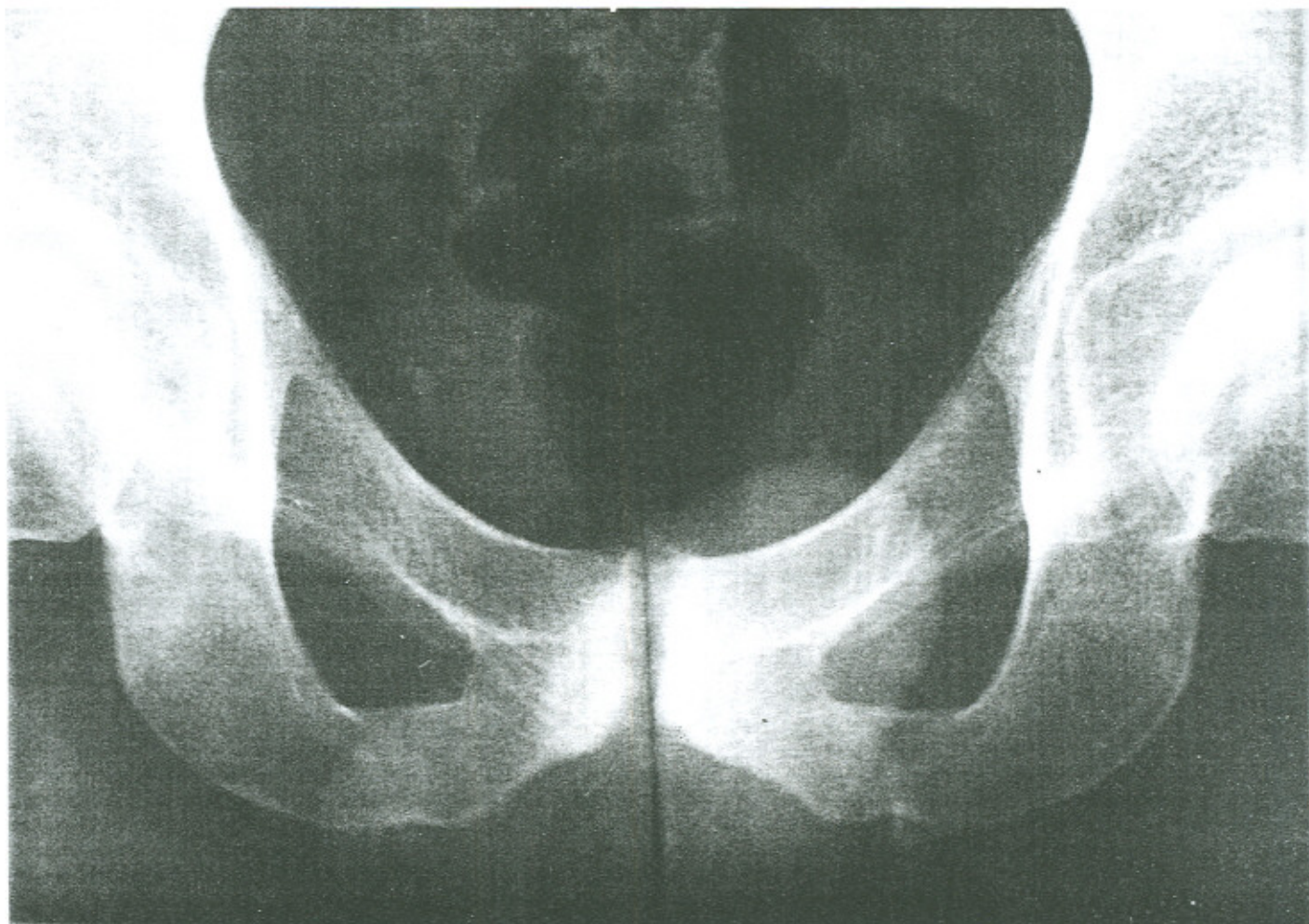
Examination revealed a healthy looking male in no apparent distress. He stood with a straight spine on a level pelvis. There was no observable gait abnormality. The range of motion of his lumbar spine was full and painfree, except at the extreme of forward flexion which produced discomfort in the left buttock and hamstring. Lunging to the right side while standing with the legs astride, caused a sharp pain in the right lower abdomen and groin and in the left proximal medial thigh. Lunging to the left caused a slight discomfort in the right proximal medial thigh. With the legs only slightly astride the feet fixed to the ground, attempted adduction and then abduction of both legs caused a

sharp perineal, groin and buttock (near the ischial tuberosities) pain. Similar sensation, however, was not felt when such stress was isolated to either leg. Lunging in the fencer's position with the right leg extended, caused right groin and lower abdominal pain. Active straight leg raising in the supine position, with both legs together, caused pain in the right lower abdominal region, radiating into the right groin. Further resisted muscle testing of either lower extremity failed to reproduce the pain.

Motion palpation revealed painful restrictions at the level of L5-S1 and of the right sacro-iliac joint. Palpation of the pubic symphysis produced a sharp discomfort about the joint line. Deep palpation of the buttock muscles and the insertions of the abductors and adductors of the thigh were bilaterally painful and hypertonic. Orthopaedic evaluation of the hips and the knees was unremarkable. Neurological assessment of the lower limbs was normal.

The plain film radiographs (figures 1 and 2) demonstrated





**Figure 2** AP spot view of the symphysis pubis. Note the minimal widening of the symphysis, the hazy cortical margins, subchondral sclerosis and a cyst on the left inferior medial pubic bone.

that the overall bone density of the pelvis was adequate. There was minimal widening of the pubic symphysis with associated hazy cortical margins and mild subchondral sclerosis. There was the suggestion of minimal subchondral erosion with the appearance of a cyst along the inferior medial aspect of the left pubic bone. Pelvic stress studies were essentially unremarkable.

Considering the mechanism of injury, location of the pain, the examination and radiographic findings, a diagnosis of osteitis pubis was made. Interferential current was applied from the lower abdomen to the groin; while ultrasound was used directly over the symphysis pubis. Manipulation directed to the sacro-iliac joints and to the lumbar spine was performed when required. Deep soft tissue effleurage and friction massage was also done when necessary. The patient applied ice at home and refrained from running.

Due to the fact he was a competitive runner, further exercises were prescribed in order to maintain his cardiovascular and

physical fitness. This latter program involved daily stretching of the lower limbs and pelvic muscles; exercising on a computerized "Stairmaster" for one hour intervals, four times per week; resistance training using isokinetic and isotonic machines, three times per week; and running in a shallow pool. Unfortunately, the latter aggravated the skin on the soles of his feet and was discontinued. This regime was followed for a period of two months.

After the first two months, running was slowly introduced into the program, replacing the "Stairmaster". The frequency of treatments decreased as the patient improved, while still emphasizing the importance of the stretching exercises. As the symptoms abated, the distance and speed of the running workouts were increased. Although he experienced no pain with running, he continued to experience discomfort with sneezing and isometric abduction and adduction while standing. In addition to the obvious stresses encountered above, he also noted



that the position used when he performed the lumbar roll manipulation aggravated the groin pain. Subtle postural changes were made and he no longer found this a problem. When last seen approximately 3.5 months after the initial visit, he reported to be significantly improved and had returned to his regular training sessions with only occasional discomfort.

### Discussion

Pelvic and hip injuries among athletes are relatively uncommon, comprising about 2.5 to 5.0 per cent of reported injuries.<sup>3</sup> With greater numbers of individuals becoming involved in more strenuous and often demanding sports, more attention is being paid to injuries of the pelvis. These include the aponeurosis of the associated musculature and the pubic symphysis.

The symphysis pubis, formed by the symphyseal surfaces of the pubes, is an amphiarthrodial joint. The articular surfaces are covered by hyaline cartilage and are connected at the midline by a thick fibrocartilagenous interpubic disc.<sup>8</sup> The joint is strengthened superiorly by the superior pubic ligament and inferiorly by the thick arcuate pubic ligament (figure 3).

In addition to the ligamentous structures, the pubes serve as the site of attachment of several muscles. Of particular impor-

tance are the rectus abdominus, inserting into the pubic crest; the adductor longus, originating from the anterior region of the pubic body, inferior to the tubercle; the adductor brevis, originating from the body and inferior ramus of the pubes; and gracilis, originating from the lower aspect of the body and inferior ramus (figure 3).<sup>8</sup>

### Etiology

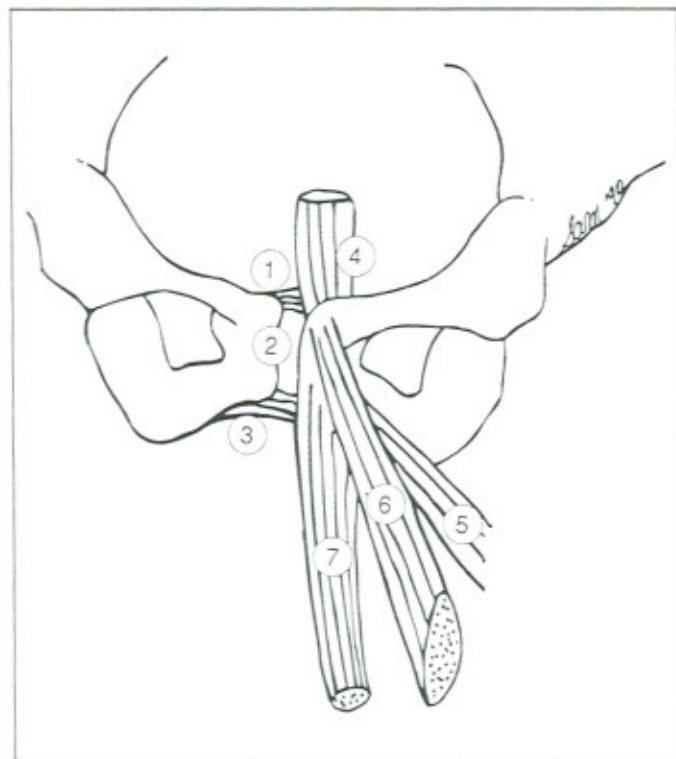
Osteitis pubis may be the result of either repetitive or single injury to the symphysis or the muscular attachment. In the above case, the athlete was involved in a repetitive weight bearing activity. This should raise the suspicion that either the muscle tendon unit was not able to withstand the normal stress for whatever reason (i.e. previous injury to this unit or muscle strength imbalance in the pelvic and hip stabilizers) or the stresses were abnormal due to faulty mechanics. Of consideration would be the alignment of the femur at the hip joint (ante- or retro-version), the Q-angle, dysfunction of the sacroiliac joints, the presence of a pelvic obliquity, or leg length discrepancy. Any alteration in these factors could impact upon the symphysis pubis or could alter the stresses on the muscle/tendon unit of either of the involved muscles.

There are essentially two proposed mechanisms, the first involves disruption of the symphysis pubis. It is proposed that increased shear forces are transmitted through the pubic symphysis via the repetitive contraction of the adductor muscles, as seen when instep kicking a soccer ball. As a result, the joint undergoes repetitive microtrauma with eventual disruption.<sup>4</sup> A similar effect is thought to occur in running where stress is produced at the symphyseal disc as a result of the sinusoidal type of motion of the hemipelvis.<sup>2</sup> Again, such repetitive microtrauma may lead to degenerative changes or a fatigue fracture at the symphysis.<sup>2,10</sup>

Wiley, on the other hand, proports that the reaction at the symphysis is secondary to avulsion injuries of the adductors.<sup>6</sup> This concept may be supported by the histological studies by Bucks et al.<sup>11</sup> and Wiley<sup>6</sup>, who reported fibrous infiltration, typical of acute inflammatory changes of non-infectious origin. This acute inflammatory reaction was seen to affect the Sharpey's fibers at the muscle/tendon attachment to bone, typical of an enthesopathy. Although there is still a question which mechanism is implicated as the primary cause, there is little disagreement that repeated minor trauma over a prolonged period of time is of major importance.

### Clinical picture

Clinically these patients present with a long standing (three months to several years) history of groin pain of insidious onset. The pain often is described as a dull ache to sharp in character. It is localized to the perineal and pubic region, but can radiate to the groin, the medial thigh, the lower abdomen and the genitalia. The pain is aggravated by activity, especially passive abduction or active resisted adduction of the hip, pivoting on one leg, sudden changes in direction, sit ups, running, kicking a



**Figure 3** Frontal diagram of the pelvis illustrating the location of the structures possibly involved in osteitis pubis: (1) superior pubic ligament, (2) pubic symphysis, (3) arcuate ligament, (4) rectus abdominus m., (5) adductor brevis m., (6) adductor longus m., and (7) gracilis m.



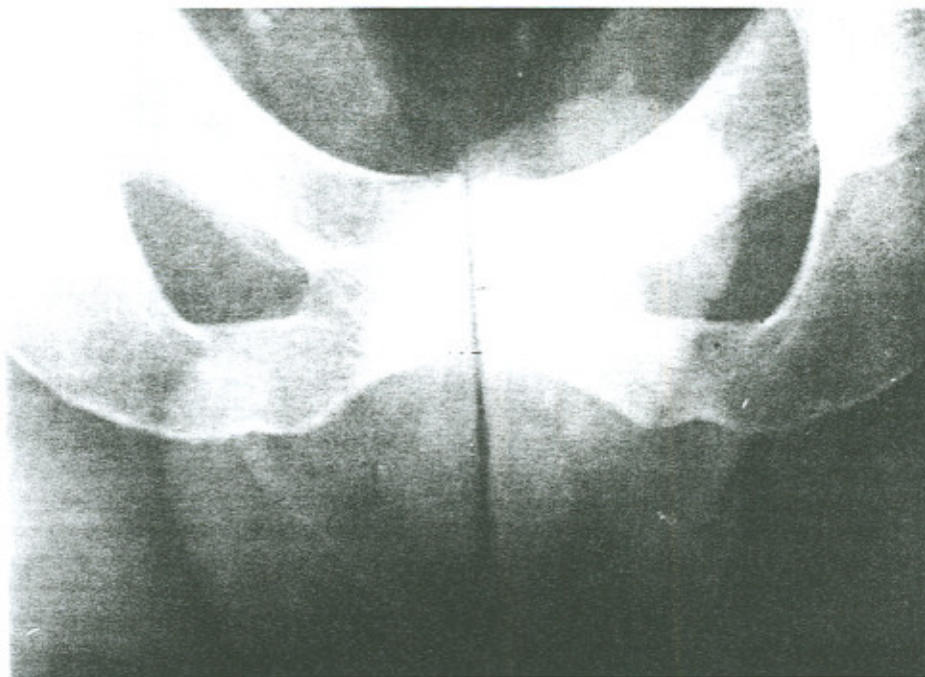


Figure 4 The typical radiographic features of osteitis pubis as noted in Table 1.

TABLE 1  
TYPICAL RADIOGRAPHIC  
FEATURES IN OSTEITIS PUBIS

- 1 Symphyseal irregularity, with erosion or resorption
- 2 Reactive subchondral sclerosis
- 3 Widening of the symphysis:  
> 8mm (females); > 10mm (males)
- 4 Possible instability:  
> 2mm elevation  
between the 2 pubic rami
- 5 Features most often symmetrical

ball, as well as coughing and sneezing. Relief is afforded by rest.<sup>2,3,6,7</sup> System review must also be completed to rule out the possibility of inguinal hernia, prostatitis, orchitis, urolithiasis, and primary or metastatic bone tumors, which may confuse the clinical picture.<sup>4,11</sup>

The physical examination reveals localized tenderness over the pubic symphysis and ischio-pelvic ramus, that may extend along the medial thigh and/or the lower abdomen depending upon which muscle is involved.<sup>2,3,4</sup> However, due to the proximity of their attachments to the pubic bone, it is difficult to isolate them. The passive range of motion is usually painfully limited on the ipsilateral side of involvement. Active and resisted adduction and trunk flexion is often painfully restricted.<sup>4</sup> Palpation may reveal painful dysfunction of the sacroiliac joint and in the more chronic cases, clicking may be felt in the pubic area.<sup>12</sup> Hypertonicity of the adductors and/or distal rectus abdominus may be palpated. As seen in the above case, the only physical findings are those that stressed the involved structures. Further orthopaedic and neurological examinations are often unremarkable.

#### Radiographic assessment

Plain film radiographic assessment is the diagnostic imaging technique of choice. Typical routine views include a standing AP pelvis, a prone coned view of the pubic symphysis, a lumbar lateral which includes the pubes, and PA stress films.<sup>13</sup> There are two possible stress positions to evaluate symphyseal instability. The first is alternating weight bearing on each leg, typical

of a "flamingo" stance. The second is standing on a stool and allowing the non supporting leg to hang suspended off the edge of the stool (Chamberlain's view).

Table 1 outlines the classical radiographic features of osteitis pubis. (See figure 4 for radiographic correlation.) These features may not be seen until 6-8 weeks after the beginning of symptoms. The radiographs may also reveal loose bony fragments along the margin of the symphysis. However, Wiley emphasizes that normal variants about the pubes, especially in the adolescent, may complicate the interpretation.<sup>6</sup>

Interpreting abnormal radiographs of the pubes must include several differential diagnoses, including stress fractures and avulsions.<sup>14</sup> In the latter, a discrete bony fragment at the inferior angle of one pubic margin, with irregularity and sclerosis is seen. Stress fractures, on the other hand, may not be immediately seen, and may require follow up films in 2-3 weeks. They may then show periosteal new bone, sclerosis with articular resorption and possible unilateral cortical disruption. Other disorders which should be considered are infection, inflammatory arthropathies (e.g. ankylosing spondylitis psoriatic arthritis, Reiter's syndrome) and metabolic disorders (e.g. hyperparathyroid disease).<sup>14</sup> A thorough search of the pelvis would yield specific radiographic features of these other disorders.

In cases of persisting pain, scintigraphy (MDP 99m Tc) should complement the radiographic examination.<sup>13</sup> Up-take noted on the bone scan usually precedes the appearance of radiographic signs and may also be used to follow its progression. As healing progresses (which may take 2-8 months), the



joint space narrows, the sclerosis becomes less marked, restoration of the osseous surfaces are noted and partial or complete ankylosis may at times occur.<sup>15</sup>

### Treatment

The lack of consensus in treatment of osteitis pubis, reflects the dubiety of its etiology. There is consensus, however, that treatment is difficult and lengthy with the possibility of recurrences high.<sup>3,4</sup> The majority of the reports advocate a treatment regime which includes rest, non steroidal anti-inflammatory drugs, local cortisone injections, physical therapy and, in some cases, surgery.<sup>2-7</sup> In one report, spontaneous relief of symptoms was recorded.<sup>6</sup> The common element in all the reports is the need for sufficient rest, avoiding any strenuous activities, including vigorous sexual activity.<sup>4</sup>

Nevertheless, as a practitioner you are faced with the inevitable task of treating these individuals. The approach taken in the above case reflects one taken for athletes with avulsion injuries.<sup>16</sup> (See Table 2) Each phase attempts to improve upon the function of the muscles and the joints. Attention is also directed to articular dysfunctions of the sacroiliac, lumbar zygapophysial joints and the lower limb joints. The time spent in each phase may vary according to the extent of injury, its chronicity, and the athletes response to therapy. Understanding the mechanics involved in the particular incriminating activity may enable the practitioner to establish specific exercise programs to strengthen and/or stabilize the anatomical regions subjected to repetitive strain. Further analysis of the training program, site of activities, and equipment may give further insight into preventative measures.

**TABLE 2**  
**TREATMENT FOR OSTEITIS PUBIS\***

Phase I	<ul style="list-style-type: none"> <li>• Rest the involved area</li> <li>• Pain control (ice, TENS, IFC, US, massage)</li> </ul>
(Week 1-2)	<ul style="list-style-type: none"> <li>• Correct spinal and pelvic dysfunctions</li> <li>• Maintain cardiovascular fitness (alternative non-weight activity)</li> </ul>
Phase II	<ul style="list-style-type: none"> <li>• Ensure adequate joint play (pelvis and hip)</li> </ul>
(Week 2-4)	<ul style="list-style-type: none"> <li>• Passive and assisted active exercises of pelvic and lower limb muscles</li> </ul>
Phase III	<ul style="list-style-type: none"> <li>• Progressive resistance program of pelvic and lower limb muscles</li> </ul>
(Week 4-6)	<ul style="list-style-type: none"> <li>• Use isotonic - isokinetic machines</li> </ul>
Phase IV	<ul style="list-style-type: none"> <li>• Gradual return to specific activity</li> </ul>
(Week 6-8)	<ul style="list-style-type: none"> <li>• Increase strengthening and stretching exercises</li> </ul>
Phase V	<ul style="list-style-type: none"> <li>• Return to full activity</li> </ul>

\* after Metzmaker and Pappos<sup>16</sup>

Although there have been no convincing long-term studies performed, the therapeutic goal is to ensure flexibility, then strength, and finally improved endurance of the involved muscles, thereby limiting their potential for premature fatigue. As a last resort, invasive methods including injection and surgery, may be required should adequate conservative measures fail. Most athletes will be able to return to sports after 2-4 months.<sup>4</sup> The patient should be warned against the possibility of recurrences. Such recurrences are frequent and may lead to frustration if this is not articulated to the patient.

### Conclusion

Pain in the region of the symphysis pubis may be the result of repetitive microtrauma producing a characteristic clinical and radiographic picture. Caution should be exercised, as it is imperative to also rule out conditions which may refer pain to this region. Treatment is often difficult and lengthy, with the possibility of recurrence of the signs and symptoms.

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