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CASE REPORT

Sacral stress fracture: an unusual cause of low back pain in an amateur tennis player

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Stress fractures are common in athletes, and their incidence in sport is estimated at 2–4%. A case is reported of a stress fracture of the sacrum in an amateur tennis player. The patient was treated with rest and physiotherapy, focusing on stretching programmes and analgesic treatments, followed by an educational programme of tennis training and muscle strengthening. This appears to be the first report of this pathology in a tennis player.

Stress fracture of the sacroiliac joint is rare and may present with symptoms similar to those of low back pain. According to the literature, the incidence of the symptoms, which are similar to those of sciatic pain, is 1–30% and is influenced by the sport, sex, age, and training intensity and frequency.

The purpose of this paper is to report a sacral stress fracture in an amateur tennis player. This is the first report in the medical literature of this kind of injury in tennis.

CASE REPORT

A 46 year old, right handed, male amateur tennis player sought medical assistance for low back pain, on the right side, irradiating to the gluteus region and posterior surface of the proximal thigh. The pain had begun one month before presentation and was related to an increase in the number of tennis matches. The patient had started playing amateur tennis in the preceding 12 months, having regular classes for an average of six hours a week, and playing at weekends for four to six hours. He had never previously suffered pain in that region.

At the physical examination, the patient presented with ischiotibial muscle shortening, popliteal angle of 45° bilaterally, and a subtle bilateral shortening of the anterior rectus. Palpation of the right gluteus region was a little painful, and the Lasague manoeuvre was negative bilaterally. A neurological examination was normal. Global palpation of the right sacroiliac joint region was painful, but with no specific point being found.

Conventional radiographs of the thoracolumbar and lumbosacral spine and regular radiographs of the pelvis showed no significant changes (fig 1). Magnetic resonance imaging showed a major injury to the right of the iliac ala, with highlighted image at T2, characterising a stress fracture (fig 2).

From clinical and radiological tests, we diagnosed a sacral stress fracture and initiated clinical treatment consisting of non-steroidal anti-inflammatory drugs for one week in association with a physiotherapy programme, which focused on stretching of the posterior leg muscles, abdominal muscle strengthening, and core stabilisation manoeuvres. Treatment lasted six weeks, although pain was controlled after one week of medication and after withdrawal from sports activity.

The patient returned to sports activity after six weeks of treatment, starting with running, swimming, and tennis specific movements, gradually increasing the amount of time every week. He also worked with the coach for four weeks making changes to his tennis strokes. After these 10 weeks, the patient resumed playing tennis as usual, with no low



Figure 1 Radiograph of the pelvis.



Figure 2 Magnetic resonance image of the pelvis. Note the line of the stress fracture (arrow).

back pain on clinical examination during palpation of the sacral bone.

DISCUSSION

The incidence of stress fractures in athletes ranges from 1.4% to 4.4% (2% in men, and 7% in women).¹ They occur in young patients, with a history of repetitive activity and are differentiated from acute fractures by the absence of an acute traumatic event. There is usually an insidious onset on symptoms, which are not universally present.²

The stress fracture is an unusual cause of low back pain in athletes, and its cause is controversial. A potential explanation is vertical concentration of the stresses of the body's forces dissipating from the spine to the sacrum, which imposes unusual stress on normal bone. In tennis, it seems to result from the repetitive movements involved in baseline strokes and the frequent changes in direction. Another reported cause is discrepancy between the lower limbs, but we do not know on which side it is more common.³

The clinical findings are characterised by lumbar and/or sacral pain, of insidious onset, with no history of trauma, and can occasionally irradiate to the gluteus region or the leg. The onset of pain is usually only after sports activity, and is located near the area of the bone involved, but, as time goes on, the pain can become continuous, limiting sports activity.⁴ Neurological tests are usually normal, but, in rare cases, they may reveal signs of irritation of sacral nerve roots.⁵

Radiographs of the sacral region may be normal.⁴ Sacral fractures are difficult to evaluate on radiographic images because of the three dimensional arrangement, and also because they do not produce callus ossification.⁶

Bone scintigraphy is considered to be the most effective method for detecting the injury, but it is not specific enough to identify anatomical detail.⁷

Magnetic resonance imaging is the first choice for diagnostic research and for providing a differential diagnosis. It will show a low sign at T1 and a high sign at T2, although these are not specific signs, as they may be present in other conditions such as osteoporosis and infection.⁸ A linear sign can be seen in some cases, and about 25% of cases of multiple injuries can be detected.⁹

Patients with sacral stress fractures improve quickly with rest and abstinence from sports activity for four to six weeks. Gradual return to activity is crucial to allow complete healing of the injury, and this should be emphasised to athletes, as they are likely to return to sport too early.^{1 4 5 9}

Administration of analgesics at the beginning may help the patient to comply with the physiotherapy programme. Non-steroidal anti-inflammatory drugs may be used, but there is still no consensus about the effect of their chronic use on bone union.^{7 10}

What is already known on this topic

- Stress fracture of the sacrum is rare, and often underestimated
- Radiographs are usually normal, and doctors often forget this injury when diagnosing the cause of low back pain

What this study adds

- This is the first report of a sacral stress fracture in a tennis player
- It is important to consider this injury in the diagnosis of low back pain in tennis players

Authors' affiliations

R T Silva, Center for Sports Medicine, Sao Paulo, Brazil

A De Bortoli, UNIFESP-EPM, Sao Paulo

C F S Laurino, R J Abdalla, M Cohen, CETE-UNIFESP-EPM, Sao Paulo

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Correspondence to: Dr Silva, Center for Sports Medicine, Rua Carmelo Damato 40, Sao Paulo 04084-100, Brazil; rgtsilva@uol.com.br

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