NUTRITIONAL OSTEOMALACIA PRESENTING WITH PLANTAR FASCIITIS

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We report five patients with nutritional osteomalacia who presented with the symptoms and signs of plantar fasciitis. All the patients were Asian vegetarian women. All improved with treatment of the osteomalacia, albeit slowly in two cases.

The term plantar fasciitis refers to the clinical syndrome of heel pain with tenderness of the under surface of the heel at the point of insertion of the plantar fascia into the calcaneal tuberosity (Furey 1975). Other terms for this condition include the heel pain syndrome (Tanz 1963) or subcalcaneal pain (Snook and Chrisman 1972). It is thought that traction on the calcaneus sets up a low-grade inflammation which may also cause a bony proliferation extending into the plantar fascia, the so-called plantar spur (Perry 1983). Factors associated with plantar fasciitis are age, obesity, athletic activity and seronegative arthritis (Lapidus and Guidotti 1965; Resnick et al. 1977).

To our knowledge, osteomalacia has not previously been described as a cause of plantar fasciitis. We report five cases of nutritional osteomalacia presenting with plantar fasciitis. All the patients were strict vegetarian Asian women of Gujerati origin.

CASE REPORTS

Details of our five patients are provided in Table I. Case 1. This patient presented with pain in the left heel which had started during a recent pregnancy. On examination she had tenderness of the plantar surface of the left heel. She also had a waddling gait, and proximal muscle weakness. A skeletal survey revealed Looser’s zones in the left femur and bilateral plantar spurs (Fig. 1). Osteomalacia was confirmed by bone biopsy. With vitamin D and calcium therapy her myopathy recovered rapidly and the heel pain resolved over a five-month period.

Case 2. This woman presented with bilateral heel pain; she also admitted to back pain and chest pain. Because she was vegetarian, blood calcium and alkaline phosphatase were measured, and the results suggested osteomalacia. A radioisotope bone scan showed increased uptake of isotope throughout both feet but especially in the heels.

Fig. 1
Case 1. Bilateral plantar spurs demonstrated at presentation.

Fig. 2
Case 2. Radioisotope bone scan showing increased uptake at both heels.
Table 1. Details of presentation and investigations of the five patients with plantar fasciitis

<table>
<thead>
<tr>
<th>Case</th>
<th>Age (years)</th>
<th>Plantar spurs</th>
<th>Heel tenderness</th>
<th>Myopathy</th>
<th>Bone scan</th>
<th>Blood</th>
<th>Calcium* (mmol/l)</th>
<th>Alkaline phosphatase* (iu/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34</td>
<td>Bilateral</td>
<td>Unilateral</td>
<td>+</td>
<td>Not done</td>
<td>Vitamin D</td>
<td>Not done</td>
<td>1.91</td>
</tr>
<tr>
<td>2</td>
<td>34</td>
<td>Bilateral</td>
<td>Bilateral</td>
<td>0</td>
<td>Increased uptake in ribs, heels and feet</td>
<td>Not done</td>
<td>2.06</td>
<td>146</td>
</tr>
<tr>
<td>3</td>
<td>34</td>
<td>None initially</td>
<td>Bilateral</td>
<td>0</td>
<td>Not done</td>
<td>Less than 1.0 ng/ml</td>
<td>2.35</td>
<td>220</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
<td>Bilateral</td>
<td>Bilateral</td>
<td>+</td>
<td>Generalised increased uptake especially in ribs and sternum</td>
<td>Not done</td>
<td>2.22</td>
<td>74</td>
</tr>
<tr>
<td>5</td>
<td>45</td>
<td>None</td>
<td>None</td>
<td>0</td>
<td>Increased uptake in heels and feet</td>
<td>Less than 1.0 ng/ml</td>
<td>2.19</td>
<td>240</td>
</tr>
</tbody>
</table>

* Normal values: calcium 2.2 to 2.6 mmol/l; alkaline phosphatase 30 to 100 iu/l

![Fig. 3](image1.png)  ![Fig. 4](image2.png)  ![Fig. 5](image3.png)

Case 3. Radiographs taken at presentation, after four months and after two years, showing the development of plantar spurs.

(Fig. 2). Vitamin D therapy resulted in a rapid return to normal biochemistry, but the heel pain persisted for a year.

Case 3. This obese patient presented to an orthopaedic colleague with painful heels and ankles. She was found to have tenderness of the medial side of each heel pad. Radiographs showed no calcaneal spurs (Fig. 3). She was given insoles, but when reviewed four months later was no better. Biochemical investigations were then performed (Table I) and the results suggested osteomalacia. A repeat radiograph of the heels showed that bilateral small plantar spurs had developed (Fig. 4). Treatment with vitamin D corrected the biochemical abnormalities but the heel pain settled only slowly, over a two-year period. Radiographs taken after this time showed large plantar spurs (Fig. 5).

Case 4. An Asian vegan woman of 24 years presented with pain in the right heel and in the neck. Several months previously she had had a baby. On examination she was found to have tenderness over both heels. She also had proximal muscle weakness such that she could not sit up from a lying position without using her arms. Radiographs of the heels showed bilateral calcaneal spurs. Because of her diet and recent pregnancy, osteomalacia was considered likely. Her biochemistry was within normal limits, but an isotope bone scan gave the typical appearance of osteomalacia, with increased uptake in the anterior portions of the ribs and in the sternum.

Case 5. A 43-year-old vegan Asian woman presented with a nine-month history of heel pain, worse in the right than the left. She also admitted to pains in the knees and back. Local tenderness was not found in the heels. Radiographs did not show calcaneal spurs, but a bone scan showed some increased uptake in the heels and feet. The biochemical investigations confirmed a clinical suspicion of osteomalacia (Table I). She has been treated with vitamin D supplements, and her symptoms have improved.

**DISCUSSION**

Skeletal pain in osteomalacia characteristically involves the axial skeleton, ribs and long bones (Stamp et al. 1980). Heel pain is not a recognised feature of osteomalacia and we know of no previously recorded association between osteomalacia and plantar fasciitis. Heel pain which was not documented as being due to plantar...
fasciitis was, however, a prominent symptom in a group of patients with metabolic bone disease on total parenteral nutrition (Klein et al. 1980).

Our patients had the features of plantar fasciitis including the development of plantar spurs while under observation in one case, and of increased radioisotope uptake in the heels (as described by Sewell et al. 1980) in two cases. In all five cases the symptoms settled with correction of the vitamin D deficiency, albeit slowly in two instances. The fact that all our patients were vegetarian Indians reflects, we believe, the fact that this population has a high incidence of osteomalacia (Stamp et al. 1980; Stephens et al. 1982). Osteomalacia may predispose to plantar fasciitis by causing weakness of the intrinsic muscles of the feet or by softening the calcaneus, leading to excess strain on the plantar fascia or to a traction injury at its insertion, or both.

It would be wise to consider osteomalacia in all patients presenting with plantar fasciitis, and to perform investigations to exclude or confirm osteomalacia in those patients with other clinical features of the condition or known to have a high risk of developing it.

REFERENCES


