COMPRESSION OF THE COMMON PERONEAL NERVE BY INTRAMUSCULAR GANGLION FROM THE SUPERIOR TIBIO-FIBULAR JOINT

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Eight patients had symptoms from ganglia arising from the superior tibio-fibular joint with physical signs that resembled the anterior tibial and peroneal compartment syndromes. Five ganglia were in the peroneus longus muscle in which they produced only an ill-defined firmness. Histologically the ganglia showed much cellular activity which must not be mistaken for malignant change.

The first reference to involvement of peripheral nerves by ganglia was in the report by Wadstein (1931) in which the common peroneal nerve was affected intra-neurally. Similar examples were described by Ellis (1936), Ferguson (1937), Brooks (1952), Clark (1961), Parkes (1961), Barber, Bianco, Soule and MacCarty (1962) and Stack, Bianco and MacCarty (1965). It has been shown that the ganglion arises from the superior tibio-fibular joint and that it reaches the parent trunk along its sensory branch to the joint. Entrapment lesions of the lateral popliteal nerve by the origin of peroneus longus have also been described (Sidey 1969).

In one of the cases reported by Brooks (1952) the ganglion invaded the tibialis anterior muscle. No other reference to an intramuscular ganglion has been found in the literature.

During the ten years 1964–74 eight patients with ganglia arising from the superior tibio-fibular joint have been treated. In five of the patients the ganglia lay within the peroneus longus muscle and were connected to the superior tibio-fibular joint through the tendinous origin of the muscle. One ganglion (Case 7) was partly intrasosseous, partly intermuscular and intramuscular (Fig. 1). The remaining two ganglia were within the muscle fascia, invading the peroneus longus muscle (Cases 3 and 6).

THE CASES

The main clinical features of the eight patients are summarised in Table I. There were six men and two women in the series. All but two of the patients were between fifty and sixty years of age. Two of the patients (Cases 5 and 6) complained only of a swelling over the outer aspect of the leg below the head of the fibula with no subjective or objective evidence of compression of the common peroneal nerve. The diagnosis was made from the experience of the previous patients. It is not unreasonable to assume that if the diagnosis had not been made, and if the ganglia had not been excised while comparatively small, these patients would have had nerve involvement later. A third patient (Case 3) had been aware of a swelling below the head of the fibula for twenty years; the swelling had become painful twelve days before admission, the pain radiated to the region of the lateral malleolus and the patient was unable to extend the ankle. At operation recent haemorrhage into the ganglion was found. The sudden increase in tension in the ganglion was the cause of the pain and was also responsible for the compression of the nerve. Four patients complained of aching pain as well as swelling. The pain was aggravated by exercise which also produced radiation of pain to the ankle.

TABLE I
SUPERIOR TIBIO-FIBULAR JOINT GANGLIA COMpressING THE COMMON PERONEAL NERVE

<table>
<thead>
<tr>
<th>Case number</th>
<th>Date seen</th>
<th>Age (years)</th>
<th>Symptoms and signs</th>
<th>Neurological findings</th>
<th>Post-operative course</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1964</td>
<td>28</td>
<td>Pain lateral to right knee radiating to ankle. Diffuse swelling and firmness in upper part of peroneus longus muscle</td>
<td>Weakness of peroneal and anterior tibial muscles. Sensibility normal</td>
<td>Full recovery of muscle power. Recurrence of ganglion 5 years later. Excision. No further recurrence</td>
<td>Intramuscular ganglion</td>
</tr>
<tr>
<td>2</td>
<td>1966</td>
<td>31</td>
<td>Swelling of lateral side of left calf for 2 weeks with radiating pain to ankle for 2 weeks</td>
<td>None</td>
<td>Recurrence of pain and swelling 4 years later. Excision. Lost to follow-up.</td>
<td>Intramuscular ganglion</td>
</tr>
<tr>
<td>3</td>
<td>1967</td>
<td>55</td>
<td>Painless swelling of lateral side of left calf for 20 years. Sudden pain radiating to the ankle for 12 days</td>
<td>Paralysis of muscles supplied by anterior tibial nerve. Sensibility normal</td>
<td>Full recovery of muscle power. No recurrence</td>
<td>Ganglion invading peroneus longus muscle</td>
</tr>
<tr>
<td>4</td>
<td>1968</td>
<td>55</td>
<td>Swelling in left peroneus longus muscle. Tingling and numbness of lateral calf after exercise</td>
<td>Weakness of peroneal and anterior tibial muscles. Sensibility normal</td>
<td>Full recovery of muscle power. Wide excision one year later because of histology report (Fig. 4)</td>
<td>Intramuscular ganglion</td>
</tr>
<tr>
<td>5</td>
<td>1969</td>
<td>53</td>
<td>Painless swelling over lateral aspect of calf</td>
<td>None</td>
<td>No recurrence</td>
<td>Intramuscular ganglion</td>
</tr>
<tr>
<td>6</td>
<td>1970</td>
<td>50</td>
<td>Painless swelling over lateral aspect of calf</td>
<td>None</td>
<td>No recurrence</td>
<td>Ganglion invading peroneus longus muscle</td>
</tr>
<tr>
<td>7</td>
<td>1971</td>
<td>60</td>
<td>Pain radiating from left knee to ankle on lateral aspect, aggravated by exercise. Firmness of upper part of peroneus longus muscle</td>
<td>Weakness of peroneal and anterior tibial muscles. Anaesthesia of first interdigital cleft</td>
<td>No recurrence. Lateral popliteal nerve explored because of return of pain. Full recovery</td>
<td>Intraosseous, intermuscular and intramuscular ganglion (Fig. 1)</td>
</tr>
<tr>
<td>8</td>
<td>1974</td>
<td>53</td>
<td>Pain and swelling over the lateral aspect of the right leg below the knee. Pain increased by exercise. Firmness in upper part of peroneus longus</td>
<td>Weakness of anterior tibial muscles. Anaesthesia of first interdigital cleft</td>
<td>Full recovery of power and sensibility. No recurrence</td>
<td>Intramuscular ganglion (Figs. 2 and 3)</td>
</tr>
</tbody>
</table>

Case 8 typifies this lesion. A man aged fifty-three years complained of aching and swelling below the knee on the outer side of his leg. The pain became more severe if he walked quickly. There was an ill defined swelling in the upper third of the right peroneus longus and firmness of this part of the muscle. There was no muscle weakness or sensory impairment. When the patient was admitted for operation two months later there was weakness of the muscles supplied by the anterior tibial branch of the common peroneal nerve. At operation a large ganglion was excised from the peroneus longus and the stalk was traced to the superior tibio-fibular joint (Figs. 2 and 3).

The ganglia recurred in three patients, and a fourth (Case 7) had further pain in the leg two and a half years after operation. This patient originally had the combined intraosseous and intramuscular ganglion which infiltrated the anterior tibial muscle and passed down both sides of the interosseous membrane. The common peroneal nerve was explored. There was no evidence of recurrence of the ganglion, and the neurolysis relieved his symptoms.

Failure to recognise that these ganglia arise from the neighbouring joint (King 1932) and not from collagen degeneration in fascia (Carp and Stout 1928; Soren 1966) is the most likely explanation of recurrence of ganglia. Many of these ganglia are lobulated and infiltrate between the muscle fibres, making total excision difficult, and this may also be a factor in recurrence.

The tissue excised after the recurrence in Case 4 was examined histologically and was reported as a possible synovial sarcoma because of the finding of mitotic figures, duplication of the lining cell layer and areas of necrotic muscle (Fig. 4). A wider local excision of tissue in the area, including the superior tibio-fibular joint and proximal third of peroneus longus muscle, was undertaken in view of the histological report. Examination of this tissue showed no evidence of malignancy. There was no further recurrence six years later.

DISCUSSION

Intramuscular ganglion arising from the superior tibio-fibular joint should be remembered as a possible cause of compression lesions of the common peroneal nerve or its branches. The swelling in the upper part of the peroneus longus muscle may be slight because the ganglion is totally enclosed in the fibrous muscle sheath. A feeling of firmness in the muscle is a better guide to the presence of a ganglion than is swelling. Objective neurological signs may be absent but, when present, muscle
weakness is more common than sensory impairment. When sensory changes occur they are usually confined to hypoaesthesia of the first web of which the patient may not be aware.

Particularly when they are aggravated by exercise, the symptoms may simulate an anterior tibial syndrome (Horn 1945; Hughes 1948; Pearson, Adams and Denny-Brown 1948; Carter, Richards and Zachary 1949; Mavor 1956; Blandy and Fuller 1957; Paton 1968), or a peroneal compartment syndrome (Reszel, Janes and Spittell 1963; Lunceford 1965; Edwards 1969). Incision of the deep fascia will relieve symptoms temporarily but pain and signs of nerve compression will recur with further enlargement of the ganglion. The lesion is benign but, because of its infiltrating nature, the histology may suggest malignancy. Care should therefore be taken not to embark too hastily on radical surgery.

It is important to excise not only the ganglion but the stalk and its base in the superior tibio-fibular joint so as to lessen the risk of recurrence. King (1932) has shown that ganglia arise from areas of hypertrophic synovium lining joints or tendons, and failure to excise this will allow another ganglion to develop.

Radiographs of the upper tibia and fibula and the knee joint are usually normal. The presence of an intrasosseous ganglion (Hicks 1956; Woods 1961; Crabbe 1966; Crane and Scarano 1967; Seymour 1968; Goldman and Friedman 1969) in the head or neck of the fibula may indicate the cause of the common peroneal nerve compression.

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