CASE REPORT

Neuritis ossificans of the tibial, common peroneal and lateral sural cutaneous nerves

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We describe a 23-year-old woman with neuritis ossificans involving the tibial, common peroneal and lateral sural cutaneous nerves. She presented with chronic debilitating posterior knee pain. An MRI scan showed masses in these nerves, biopsy of which revealed a histological diagnosis of neuritis ossificans. Treatment with OxyContin and Neurotin for two years resulted in resolution of symptoms. Follow-up MRI demonstrated a resolution of two of the three masses. There was a persistent area of ossification without associated oedema in the common peroneal nerve. Neuritis ossificans has the histological appearance of myositis ossificans and follows a similar clinical course. The success of conservative treatment in this case suggests that the potential complications of surgical excision can be avoided.

Neuritis ossificans is a rare condition of the peripheral nerves which can mimic myositis ossificans in both histologically and radiologically. There is usually a history of injury. This is the ninth reported case and the second where medical treatment alone has been successful. Surgical resection of the lesion, although eliminating pain, will cause a motor deficit. In addition, this case differs from previous reports as three separate nerves were involved.

Case report

A 23-year-old woman presented with a four-week history of pain behind the left knee, which was particularly severe at night. On examination she was in considerable pain with her knee flexed to 45°. She would not extend her leg actively or passively because of the pain. Plain radiographs at presentation were normal. MRI showed three separate masses associated with the tibial, common peroneal and lateral sural cutaneous nerves with oedema and with enhancement after intravenous gadolinium (Fig. 1). Since the MRI showed the exact location of the lesions, and the pain was focal and not radicular in nature, electromyographic studies were not undertaken. Open biopsy was performed and a histological diagnosis of neuritis ossificans was made (Fig. 2).

She was treated with an oxycodone (OxyContin, 20 mg twice a day; Purdue Pharma LP, Stamford, Connecticut) and Neurotin (300 mg three times a day; Pfizer, New York, New York). Neurotin is a gabapentin, an anti-convulsant medication used to treat seizures as well as neuralgia. An improvement was noted in her symptoms after six to eight weeks. After treatment for 20 months she regained a full range of movement of the knee and returned to all of her previous activities without needing analgesia. There remained occasional numbness along the lateral aspect of her leg. Plain radiographs showed a single area of residual ossification of the common peroneal nerve (Fig. 3). Further MRI showed a single area of low signal in this region but without inflammation (Fig. 4). The lesions of the tibial and lateral sural nerves had disappeared.

Discussion

The term neuritis ossificans was first used in 1946 to describe a calcified lesion within the brachial plexus of a 29-year-old woman. It was thought to be degenerative in origin. Many years later, the pathology of the specimen was reviewed and re-interpreted as an osteogenic sarcoma of intermediate grade. In 1997, Wasman et al. presented a case of intraneural ossification of the median nerve, which histologically resembled myositis ossificans. Seven cases of neuritis ossificans treated by excision have been reported. The nerves involved were the digital, ulnar and median in the upper limb and the sciatic, tibial and saphenous in the lower limb. Trigkilidas et al. reported an eighth case affecting the common peroneal nerve in 2009. This was treated conservatively with improvement in the patient’s symptoms.
Ossification within a peripheral nerve is rare and is usually associated with a benign neoplasm, specifically fibrolipoma, neurofibroma, and neurilemoma.\textsuperscript{10-12} Neuritis ossificans is usually visible on a plain radiograph as a calcified density.\textsuperscript{8} It appears on the CT\textsuperscript{8} and MRI\textsuperscript{6,8} as a dense mass in the region of the affected nerve.

Pathologically the lesion has three well-defined zones, which were present in our case.\textsuperscript{8} Centrally, there is fibrovascular tissue. Adjacent to this is an intermediate zone, with cells forming ill-defined trabeculae. Finally, in the outermost zone, the osteoid forms mature bone. The condition closest to it histopathologically is myositis ossificans; which usually follows trauma and is most commonly seen in the quadriceps femoris and the brachialis muscles.\textsuperscript{13}

In the case presented here the initial radiographs were normal. MRI scans showed multiple rounded masses, each of which contained an area of low signal consistent with bone as well as oedema within the nerve. After intravenous gadolinium, these areas were enhanced greatly. These changes were suggestive but not diagnostic of neuritis ossificans.

Three nerves in the popliteal fossa were involved. The patient was treated by medication alone, avoiding the complications associated with resection of the nerve. Over a two-year period her pain resolved and she recovered a full range of movement. Subsequent MRI showed residual
involvement of the common peroneal nerve only, without inflammation. Neuritis ossificans is a rare condition with a natural history that appears to mirror that of myositis ossificans.

References