Carpal tunnel syndrome caused by a large osteochondroma

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Introduction

Although many types of mass lesions within the carpal tunnel have been implicated in causing carpal tunnel syndrome, osteochondromas in this location rarely have been described. We describe a case of recurrent carpal tunnel syndrome 5 years after endoscopic carpal release, with intraoperative and pathologic analyses proving the mass to be this unusual but benign tumor.

Materials and Methods

Our patient is a 78-year-old female who presented with complaints of numbness, swelling, and pain in her left hand. Five years ago, she had undergone an endoscopic carpal tunnel release with significant relief of symptoms. Her past medical history is significant only for rheumatoid arthritis, which is well controlled with medical treatment. Physical examination revealed a non-tender but indurated area deep to the thenar eminence consistent with a mass in the distal portion of the carpal tunnel.

Plain radiographs revealed a calcific “ghost” in the region of the carpal canal (Figs. 1 and 2). Further

workup included MRI which showed a $1.9 \times 1.4 \times 2.1$ -cm³ heterogeneous volar mass within the carpal tunnel causing ulnar displacement of the median nerve and flexor tendons (Figs. 3 and 4). At this time, the differential diagnosis included hemangioma and giant cell tumor. After discussion with the patient, the decision was to excise the mass for definitive diagnosis.

Results

A standard carpal tunnel approach was used and extended across the volar wrist crease for exposure. Within the carpal tunnel, the mass was identified and seen to cause ulnar displacement of the median nerve (Fig. 5). The mass was densely integrated into the bony structures. The bulk of this mass was fractured off its base, and the remainder was removed in piecemeal fashion with a bone rongeur. A cross section was performed intraoperatively which revealed bony characteristics within the mass (Figs. 6 and 7). The pathological examination revealed benign osteocartilaginous proliferation in keeping with osteochondroma (Fig. 8). A benign postoperative course ensued as the patient engaged in early hand therapy. At her recent 3-month follow-up, the patient reports significant relief of symptoms.

Discussion

Carpal tunnel syndrome can be caused by a wide variety of mass lesions within the carpal tunnel with fibrolipomatous hamartomas extensively described [2, 7]. Other causes include anomalous muscle bellies of the lumbrical muscles [1, 14] and flexor digitorum superficialis [16], gouty tophi [9, 11], and palmaris longus hypertrophy or anomalies [4, 6].

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Fig. 1 Plain films demonstrating a large calcified structure adjacent to the index metacarpal (PA view)

Additionally, the presence of a palmaris profundus has been implicated in carpal tunnel syndrome as well [10, 13].

In contrast, carpal tunnel syndrome caused by an osteochondroma is an extremely rare occurrence. A PubMed literature search revealed only two other similar cases. The first was described by Nather and Chong in 1986, when a 47-year-old woman presented with a visible volar lump associated with shooting pain in her thumb and index finger. Intraoperatively, the authors described a ganglion cyst originating from the flexor pollicis longus tendon's synovial lining; within the cyst,

Fig. 2 Plain films showing the calcified structure volar to the index metacarpal (lateral view)

Fig. 3 MRI showing the large space-occupying lesion compressing the contents of the carpal tunnel (axial view)

a bony lump was excised and was pathologically consistent with a tendon sheath osteochondroma [8]. In the second case, Hofmann et al. described a 75-year-old diabetic patient who presented with carpal tunnel syndrome and a palpable hardening on the volar distal radius [5]. Based on their description of the surgical specimen, however, this more likely was a soft tissue chondroma without a bony component.

Of incidental interest is the case report by Squire et al. from 1992, in which an Arabian stallion presented with intermittent lameness. This was eventually discovered to be carpal canal syndrome caused by a palmar radial osteochondroma. After this was removed arthroscopically, the horse apparently resolved its lameness by 2 months postoperatively and resumed his training by 4 months [17].

While osteochondromas are not uncommon in the wrist, they rarely present with symptoms secondary to nerve compression. A further literature search on osteochondromas reveals a case report of an osteochondroma causing compression of the posterior interosseous nerve at the level of the elbow [3]. Osteochondromas have been described

Fig. 4 MRI views showing the large space-occupying lesion compressing the contents of the carpal tunnel (coronal view)

Fig. 5 Intraoperative photo demonstrating the large mass within the carpal tunnel

elsewhere in the hand, including Shepherd's description from 1942 of an osteochondroma within a flexor tendon sheath [15] and similarly Rockey's report of a locking trigger finger in a 13-year-old girl secondary to a tenosynovial osteochondroma [12].

Given the slow-growing nature of these lesions, it is interesting to speculate if our patient initially presented with carpal tunnel syndrome 5 years ago due to a mass effect. If the osteochondroma were present but smaller at the time, it is conceivable that the first carpal tunnel release would have afforded relief of her symptoms, at least until the mass grew to the point of again causing additional compression.

Fig. 6 The excised specimen in its entirety, about $3.0 \times 1.5 \text{ cm}^2$

Fig. 7 Cross section of specimen exhibiting bony characteristics

Depending on the size of the osteochondroma at the time of the initial surgery, it is also possible that preoperative x-rays or even open carpal tunnel release would have identified the lesion sooner. However, preoperative films are not always a standard part of the workup for carpal tunnel syndrome, and in the majority of cases, an endoscopic carpal tunnel release will be sufficient as well. Our report is the one of very few descriptions in the literature of an osteochondroma causing carpal tunnel compression since Nather and Chong's case report in 1986, and it reminds us that we should thoroughly search for other etiologies when our patients present with intractable or recurrent carpal tunnel syndrome.

Fig. 8 Cartilaginous cap with underlying mature bony trabeculae. (H&E, $4\times$)

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