

Case reports

Posterior interosseous neuropathy due to compression by a soft tissue chondroma of the elbow

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Abstract

A case of soft tissue chondroma or extraskeletal chondroma is described. The tumour caused compression of the posterior interosseous nerve. Excision and biopsy were performed with complete resolution of the symptoms.

Key words: Radial nerve; chondroma; soft tissue tumor; nerve compression.

Introduction

The (osteo)chondroma of soft tissues is a rare benign tumor. It has been reported in several tissues of the limbs and also in particular localizations (kidney, liver, tongue). The diagnosis is an histological one, after elimination of osseous chondroma or synovial (osteo)chondroma. We report a (new) case in the forearm with compression of the posterior interosseous nerve (PIN).

Case Report

A 50-year-old man consulted the outpatient clinic for progressive weakness of the left thumb. He also noted a hard swelling in the forearm. This swelling had quickly grown over a few weeks but remained stable for the last 6 months. During the physical examination the tumoural swelling in the forearm was obvious (Fig. 1); we also noted a weakness in the extension of the thumb with a 2/5 force of the extensor pollicis longus and 3/5 muscle force of the long extensors of the fingers; extension of the wrist was slightly diminished (Fig. 1). Sensation was normal; there were no vascular troubles. The passive ranges of motion of the elbow, wrist, thumb and fingers were normal.

The tumour was hard on palpation, but painless. It appeared to be connected to the deeper structures, but the overlying skin was painless, of normal colour and consistency and non adherent. The temperature of the overlying skin was symmetrical to the opposite side. A Tinel sign could not be elicited at median, ulnar nor radial nerve.

Radiographs revealed a soft tissue mass, 3 to 4 centimeters in diameter with peripheral ossification. The structure and mineralization of the bones was normal; apparently there was no connection between the bones and the tumour (Fig. 2).

Electrophysiological examination revealed disturbed contraction of all wrist and finger extensors. Fibrillation potentials and positive sharp waves at rest were seen in M. extensor indicis, M. extensor digitorum communis, M. extensor carpi ulnaris, M. extensor pollicis longus and extensor carpi radialis. All these muscles showed a very poor contraction pattern during maximal contraction. The M. brachioradialis was normal. The motor conduction velocity of the radial nerve was 53 m/sec, with an amplitude of 1000 μ V and terminal latency of 3.1 msec.

The shortest F-wave latency was 29.6 msec. The F-wave chronodispersion was 3.4 msec and the F-wave persistence 4/10. The radial nerve had a sensory terminal latency of 26 msec over a distance of 14 cm. The amplitude was 12 μ V.

An exploration with resection of the tumor was planned under general anaesthesia. The elbow was approached anteriorly. After isolation of the radial nerve, its superficial branch and the posterior interosseous nerve, the median nerve and the radial artery, the tumour could be dissected. The tumour was localized deep to the brachioradialis muscle and proximal to the fibrous origin of the supinator (Fröhse's arcade). There were no connections to the bones, elbow joints nor to any synovial structures in the elbow region. The posterior interosseous nerve was obviously compressed by the tumor (Fig. 3). Due to the large volume the radial nerve more proximally seemed also somewhat flattened.

The postoperative course was uneventful. Three weeks postoperatively the patient had recovered a full active range of motion and a normal force of the extensors of the thumb and fingers. At one year postoperative follow-up there are no signs of recurrence. The histological examination confirmed the diagnosis of soft tissue osteochondroma.



FIG. 1. — Clinical aspect of the patient. Note the incomplete extension of thumb and fingers. The tumour can be suspected



FIG. 2. — Radiographs of the elbow, demonstrating the calcified mass.

Discussion

Several criteria are necessary to establish the diagnosis of soft tissue chondroma. Besides the histological confirmation of a (benign) cartilaginous tumor, the tumor must be distinguished from a skeletal chondroma (intact bones), periosteal chondroma or synovial osteochondroma (absence of adherency). These features were present in this case.

Of all soft tissue chondromas the limbs are affected in 96% of the cases, with a clear predominance for the upper limb. Localization in the hand is rare (Cataloni *et al.* 1988, Del Signore *et al.* 1994, Fnini *et al.* 2004). Patients mostly consult for a mass in the soft tissues, usually without pain and of variable growth velocity. The radiographs are also variable and depend on the degree of ossification and calcium deposit. The treatment is an excisional biopsy and resection. According to Chung and Enzinger (1978) the recurrence rate is 18% ; thought to be due to the incomplete resection.

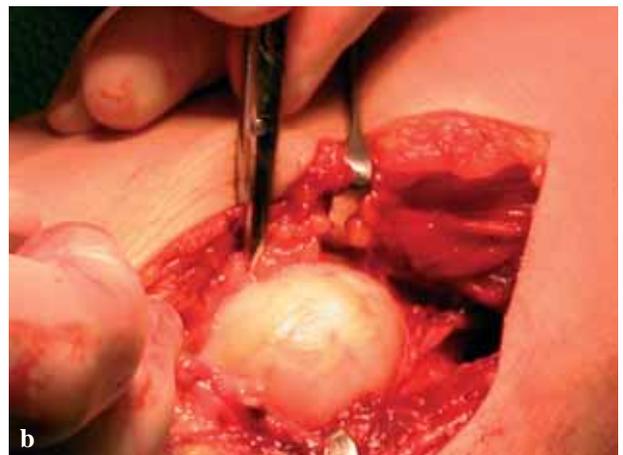
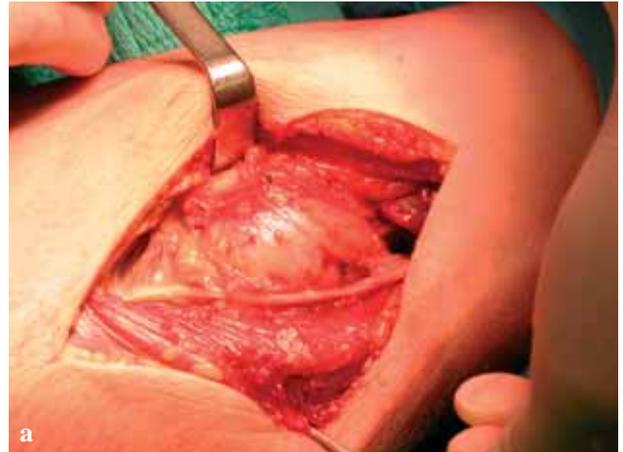


FIG. 3. — Intraoperative view a) the tumor compressing the superficial branch of the nerve and the posterior interosseus nerve ; b) after careful dissection the tumour can be seen clearly.

Compression of peripheral nerves by this tumor is rare. Peters *et al.* (1985) and Lipskeir *et al.* both (1985) and Hoffmann *et al.* (1990) reported a case of median nerve compression by a chondroma in the wrist region. Well described cases of high radial nerve compression due to humeral osteochondroma have been described by Coenen and Biltjes (1992) and by Yamamoto *et al.* (2002). A case of paralysis of the axillary nerve (Wilhaut *et al.*, 1994) and one of musculocutaneous nerve (Juel *et al.*, 2002) due to a skeletal humeral osteochondroma were reported.

Table 1

Causes of posterior interosseus nerve compression

Posterior interosseus nerve compression etiology and associated findings
Amyloid neuropathy
Congenital hemihypertrophy
Elbow arthroscopy
Elbow or radial head dislocation : acute or tardy
Elbow synovial cyst
Guillain-Barré syndrome
Ilizarov forearm lengthening
Lipoma
Repetitive pronation/supination activities
Swimmer
Frisbee player
Go-go dancer
Violinist
Orchestra conductor
Rheumatoid synovitis
Ruptured arteriovenous malformation
Supinator
Arcade of Frohse
Intramuscular band
Distal edge
Traumatic aneurysm

Nerve compression and articular osteochondromas have been reported more frequently, especially ulnar nerve compression by osteochondromatosis of the elbow or wrist joint.

Other causes of compression of the radial nerve (or posterior interosseus nerve) have been reported (Table 1) (Eaton and Lister 1992). The involvement of the radial wrist extensors is an important feature for the exact compression level. Both (extensor carpi radialis brevis and longus) are innervated proximally of the division of the radial nerve in his superficial branch and the PIN. The weakness of extension of the wrist observed in this patient could be due to weakness of the finger extensors (also involved in wrist extension) or by slight compression more proximally (see EMG).

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