

## IATROGENIC POSTERIOR INTEROSSEOUS NERVE PALSY FOLLOWING AN ELBOW FRACTURE

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**Posterior interosseous nerve palsy following elbow surgery is not uncommon. Nevertheless, precise etiology of the palsy is rarely described in the literature. In this paper the possible causes of the posterior interosseous nerve palsy are reviewed and an uncommon iatrogenic lesion after surgical treatment of an elbow fracture is reported.**

**Keywords :** posterior interosseous nerve ; nerve palsy ; iatrogenic lesion.

**Mots-clés :** nerf interosseux postérieur ; paralysie ; lésion iatrogène.

Posterior interosseous nerve syndrome is a well-described clinical entity. It causes weakness or paralysis of the extensor muscles of the fingers and thumb. Extensor carpi ulnaris muscle is also involved but extensor carpi radialis longus muscle is not because it is innervated by the radial nerve before it divides into its two terminal branches (the posterior interosseous and the superficial sensory branches). Therefore wrist extension is maintained but is in radial deviation. There is no sensory involvement.

This case report describes a posterior interosseous nerve palsy due to nerve constrictions caused by two silk knots after surgical treatment of an elbow fracture. To the best of our knowledge such an iatrogenic cause of posterior interosseous nerve palsy has not been described in the literature.

### CASE REPORT

A 42-year old female with a bilateral elbow fracture was treated by bilateral radial head resection, open reduction and internal fixation of

the olecranon with plate and screws. The material was removed one year later. Both operations were performed under tourniquet. After the second operation, the patient developed a transient radial nerve palsy on the right side which resolved spontaneously within 6 months. Four years later, the patient complained of a progressive lack of force and difficulty in extending the fingers and thumb of her right hand. Clinical examination revealed a typical right posterior interosseous nerve paresis. The motor power of the brachioradialis, extensor carpi radialis longus and extensor carpi radialis brevis muscles was rated 5/5 and all other extensor muscles rated 3/5 according to the British Medical Council classification (1). Testing of the left hand was normal. Electrophysiological examination showed denervation of forearm and finger extensor muscles, except for the extensor carpi radialis longus, and increased distal motor latency.

The nerve was explored through a posterior muscle splitting approach exposing the supinator muscle between the extensor carpi radialis brevis and the extensor digitorum communis muscles. The radial nerve was identified and the supinator muscle was split longitudinally to expose the posterior interosseous nerve. Dissection of fibrous tissue revealed two silk knots strangling the poste-

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rior interosseous nerve at an interval of 1.5 cm. The knots were excised and, as there was not complete paralysis, only an epineural neurolysis was performed (fig. 1).

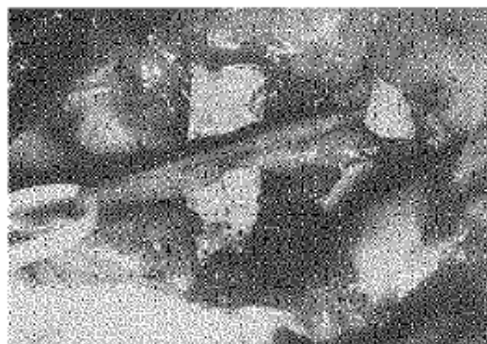


Fig. 1. — The posterior interosseous nerve after excision of the two silk knots showing the double constriction.

Postoperative physical therapy was undertaken. One year after the neurolysis, active extension of the fingers and thumb was normal (rated 5/5).

#### DISCUSSION

Many factors causing posterior interosseous nerve compression have been documented. Anatomic structures have been identified as causing compression, the most common of which is the arcade of Frohse (3). Other sites include fibrous bands at the radial head, the extensor carpi radialis brevis arch, constricting blood vessels, and the distal border of the supinator muscle. Other causes of compression are related to trauma and various masses such as lipoma, ganglion, rheumatoid arthritis, fibroma, synovial cyst, and bursa as well as arteriovenous malformation. Chronic repeated trauma related to stressful supination and pronation has been reported in swimmers, frisbee players, tennis players, violin players and orchestra conductors.

Posterior interosseous nerve paralysis following a surgical procedure at the elbow is not uncom-

mon. Young *et al.* (5) reported 16 cases of iatrogenic palsies following radial head resection, release for lateral epicondylitis, resection of osteochondroma, lipoma or radioulnar synostosis. They were treated by surgery when no recovery was observed three months after the trauma. Surgery included neurolysis, nerve suture, nerve graft and tendon transfer. Excellent or good results were documented except in three cases. In a clinical and electromyographical study of 37 posterior interosseous neuropathies, Fardin *et al.* (2) reported four iatrogenic cases following reduction of radial fracture, transposition of the ulnar nerve and excision of a lipoma. One of those four cases recovered after 18 months of medical therapy but no details are given about the other three cases. Lesions of the posterior interosseous nerve have also been reported after elbow arthroscopy (4). In none of these cases was the precise anatomical cause of the palsy described.

The current case report documents an iatrogenic lesion to the posterior interosseous nerve. To the best of our knowledge this etiology of posterior interosseous nerve compression has not been documented in the literature. The reason why four years elapsed between a first episode of paralysis (which resolved spontaneously) and the second episode of paralysis which required a surgical procedure remains unexplained.

#### REFERENCES

1. Bradley W. G., Daroff R. B., Fenichel G. M., Marsden C. D. Neurology in clinical practice, Butterworth, Londres, 1991, 279.
2. Fardin P, Negrin P, Sparta S, Zuliani C, Caocciavillani M and Colledan L. Posterior interosseous nerve neuropathy. Clinical and electromyographical aspects. Electromyogr. Clin. Neurophysiol., 1992, 32, 229-234.
3. Spinner M. The arcade of Frohse and its relationship to posterior interosseous nerve paralysis. J. Bone Joint Surg., 1968, 50-B, 809-812.
4. Thomas M. A., Fast A., Shapiro D. Radial nerve damage as a complication of elbow arthroscopy. Clin. Orthop., 1987, 215, 130-131.
5. Young C., Hudson A., Richards R. Operative treatment of palsy of the posterior interosseous nerve of the forearm. J. Bone Joint Surg., 1990, 72-A, 1215-1219.

**SAMENVATTING**

*J. P. VAN GEERTRUYDEN, P. G. VICO. Iatrogene paralyse van de nervus interosseus posterior na elleboog fractuur.*

Letsels ter hoogte van de nervus interosseus posterior zijn geen uitzondering na een chirurgische ingreep ter hoogte van de elleboog. In de literatuur vindt men zelden uitleg over de exacte etiologie van deze letsels. De auteurs bespreken de verschillende oorzaken van paralyse van de nervus interosseus posterior en beschrijven één geval van een iatrogeen letsel na chirurgische behandeling van een elleboog fractuur.

**RÉSUMÉ**

*J. P. VAN GEERTRUYDEN, P. G. VICO. Paralysie iatrogène de la branche postérieure du nerf radial après fracture du coude.*

Les lésions du nerf interosseus postérieur (branche postérieure du nerf radial) ne sont pas rares après intervention chirurgicale au niveau du coude. L'étiologie précise des lésions est cependant rarement décrite dans la littérature. Les auteurs passent en revue les différentes causes de paralysie du nerf interosseus postérieur et décrivent un cas de lésion iatrogène suite au traitement chirurgical d'une fracture du coude.