

## Delayed diagnosed intermuscular lipoma causing a posterior interosseous nerve palsy in a patient with cervical spondylosis: the “priceless” value of the clinical examination in the technological era

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**SUMMARY:** Delayed diagnosed intermuscular lipoma causing a posterior interosseous nerve palsy in a patient with cervical spondylosis: the “priceless” value of the clinical examination in the technological era.

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**Background.** Posterior interosseous nerve (PIN) palsy may present with various symptoms, and may resemble cervical spondylosis.

**Case report.** We report about a 59-year-old patient with cervical spondylosis which delayed the diagnosis of posterior interosseous nerve (PIN) palsy due to an intermuscular lipoma. Initial right hand parae-

sthesias and clumsiness, together with MR findings of right C5-C6 and C6-C7 foraminal stenosis, misled the diagnostic investigation. The progressive loss of extension of all right hand fingers brought to detect a painless mass compressing the PIN. Electrophysiological studies confirmed a right radial motor neuropathy at the level of the forearm.

**Results.** Surgical tumor removal and nerve decompression resulted in a gradual motor deficits recovery.

**Conclusions.** A thorough clinical examination is paramount, and electrophysiology may differentiate between cervical and peripheral nerve lesions. Ultrasonography and MR offer an effective evaluation of lipomas, which represent a rare cause of PIN palsy. Surgical decompression and lipoma removal generally determine excellent prognoses, with very few recurrences.

KEY WORDS: Cervical spondylosis - Clinical examination - Lipoma - Neuropathy - Posterior interosseous nerve palsy.

### Introduction

The posterior interosseous nerve (PIN) represents the deep bifurcation of the radial nerve, after this emerges, above the elbow, through the intermuscular septum between the brachialis and brachioradialis muscles. PIN passes beneath the arcade of Frohse, between supinator muscle heads, and supplies motor nerves to the posterior forearm muscles. PIN fibers mainly originate from C7 and C8 segments (1, 2). Its palsy is generally connected with traumatic lesions/spontaneous entrapment at the level of supinator muscle/fibrous arcade of Frohse (2, 3).

PIN palsy may present with different symptoms and, at times, may resemble cervical spondylosis clinical features (4).

Lipoma, a benign tumour of mesenchymal origin, re-

presents a rare cause of PIN syndrome, first described in 1953 (5).

Here, we present a case of a 59-year-old patient with cervical spondylosis which delayed the diagnosis of PIN palsy by an intermuscular lipoma.

### Case report

A 59-year-old woman presented with a 6-months history of hand paraesthesias, predominantly affecting the right hand which also appeared weak (grade 4/5, Muscle Strength Grading Scale, Royal Medical Research Council of Great Britain) and clumsy with fine motor skills (writing, buttoning, etc.). On physical examination she did not exhibit hyperreflexia, gait disturbance, nor sphincter dysfunctions. A cervical MR scan showed right paramedian C5-C6 and C6-C7 discal herniations with spinal cord compression (Figure 1).

We inserted the patient in our surgical waiting list, and recommended a period of rest with analgesics and anti-inflammatory medications followed by physical therapy. Moreover, we also prescribed gabapentin to relieve her sensory deficits.

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**Fig. 1** - Sagittal T2-weighted cervical MR image showing spinal cord compression at the C5-C6, and C6-C7 intervertebral levels (a). Axial T2-weighted cervical MR image depicting a right paramedian discal herniation at C6-C7 intervertebral level with resulting foraminal stenosis (b).

After about forty days the patient came to our first aid complaining of a progressive worsening of her right hand weakness. Physical examination revealed a severe loss of

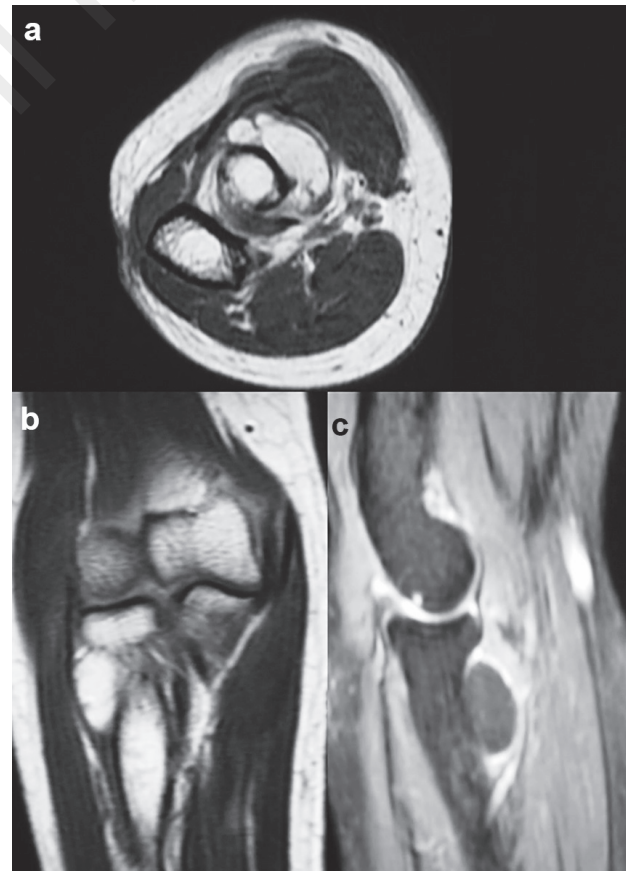
extension of all fingers (grade 2/5), and a mild strength reduction of wrist extension (grade 4/5) in radial deviation. Moreover, a careful inspection allowed to observe a slight swelling in the right anterolateral proximal forearm, more evident when the elbow was extended.

Ultrasonography showed a well-encapsulated, echogenic mass proximal to the supinator muscle. Upper extremities electrophysiology disclosed a bilateral slight sensory conduction slowing, more on the right side, and a right radial motor neuropathy at the level of the forearm.

MR scan confirmed a well-encapsulated oval lesion adjacent to the right proximal radius. The mass appeared isointense to subcutaneous fat, suggesting a diagnosis of lipoma (Figure 2).

The lesion was explored through an anterolateral approach under right upper extremity regional anesthesia. The tumor was carefully excised preserving the integrity of the superficial radial nerve (SRN) and PIN (Figure 3).

Histopathological findings were consistent with lipoma. Patient's deficits progressively improved thanks to an intensive physiotherapy. At present, one year after sur-



**Fig. 2** - Axial T1-weighted (a), coronal T1-weighted (b), and sagittal T2-weighted fat-saturated (c) MR images showing a well-encapsulated oval lesion of the right proximal forearm with signal isointense to subcutaneous fat.

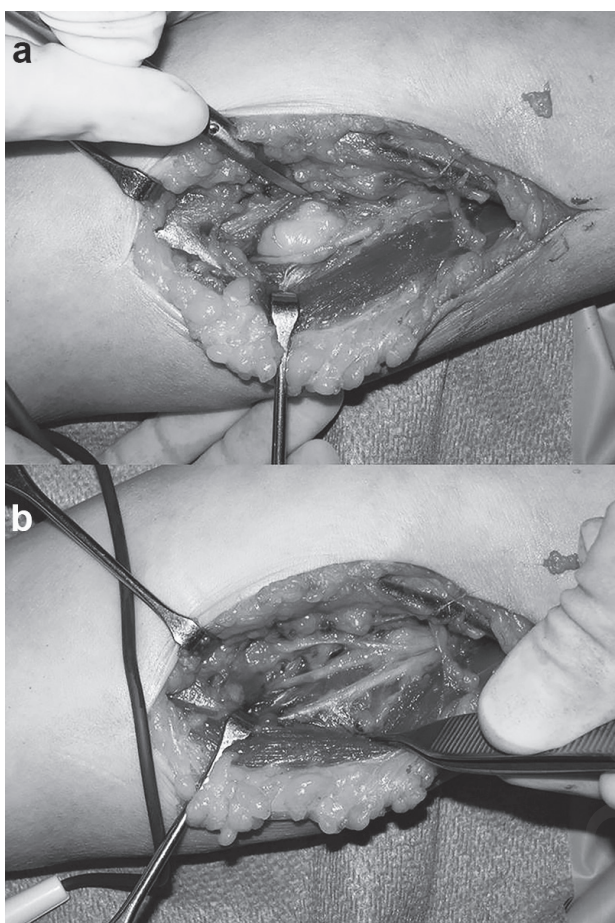


Fig. 3 - An anterolateral approach has been performed exposing a well demarcated yellowish tumor compressing the posterior interosseous nerve (a). Operative field after lesion removal and nerve decompression (b).

gery, wrist and hand function are similar on both sides. Moreover, paraesthesias also improved with conservative management. Hence, we decided to not perform any surgical cervical spine decompression, at the moment, due to the overall stability of her clinical condition.

## Discussion and Conclusion

While radiological imaging is more and more often indispensable in the diagnostic process, a careful history/physical examination is paramount to define a working hypothesis and the necessary investigations.

PIN palsy may resemble the cervical spondylosis clinical features. In our patient, the right hand clumsiness with fine motor skills, and the paraesthesias, together with the cervical spondylosis radiologic evidence, misled the diagnostic investigation, thus making us to think that the patient suffered only from a spinal pathology. Perhaps, a thorough clinical evaluation could have brought to promptly discover the painless swelling in the ri-

ght forearm, thus allowing us to reach sooner an accurate diagnosis.

Nonetheless, it has to be borne in mind that several cervical disorders may determine severe isolated upper extremities motor deficits without pyramidal signs. Electrophysiological findings may allow to differentiate between cervical and peripheral nerve lesions, as well as to assess, as in our case, their respective weight in determining patient symptoms (4).

Besides lipomas (5-7), PIN palsy may be determined by different soft tissue forearm lesions such as neurofibromas, haemangiomas, synovial chondromatosis, chondromas, myxomas, ganglions, bursitis, rheumatoid synovitis, pseudogout (3, 6).

PIN compression by a lipoma is very rare (considering their preferential subcutaneous location) and generally characterized by a gradual onset of digital extension weakness (7).

However, there are some reports about lipoma-induced, acute compression neuropathies that may be related to hemorrhagic/ischemic mechanisms. Hence, this uncommon presentation has to be taken into account in the clinical investigation of peripheral neuropathies (7).

Usually there is no wrist-drop because the fibers to the brachioradialis, extensor carpi radialis longus and brevis, and supinator muscles leave the nerve before its point of entrapment/compression (2).

Moreover, PIN compression may determine a persistent, severe pain, which may precede the motor signs, interesting the deep forearm/lateral elbow, and radiating into the neck and back (7).

Sensory deficits due to SRN involvement are instead less common for its more medial and superficial course (2, 7). At times, however, SRN may be also compressed, thus leading to paraesthesias (8).

Although clinical examination plays a key role in diagnosing PIN syndrome, radiologic studies allow to localize and define PIN abnormalities. Ultrasonography represents a safe and effective tool in this regard (9). Nevertheless, MR imaging is the procedure of choice. Indeed, it gives detailed information on PIN compressing lesions as well as on the surrounding structures, thus permitting an excellent pre-operative surgical planning (3).

Moreover, as above-mentioned, electrophysiological studies allow to clearly identify the localization and the extension of a radial nerve lesion (3).

Early surgical PIN decompression and tumor removal is recommended in patients with progressive neurologic deficits. Indeed, this may increase the chances of a full clinical recovery, which relates to symptoms duration. However, it may be difficult to promptly diagnose a PIN palsy, despite distinctive clinical findings, and a favourable post-surgical course has been reported even after some years of progressive nerve dysfunction (10).

The anterolateral approach is usually preferred to the

posterior route. Indeed, the anterolateral approach offers a better PIN visualization, thus allowing a safer dissection of the neurovascular structures from the tumor and reducing the risk of injuries (2).

Surgical decompression guarantees an excellent prognosis in most of cases. Notwithstanding, a complete lipoma removal has to be achieved, as recurrences have been reported (6).

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