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CASE REPORT – OPEN ACCESS

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Unusual Nerve Compression Secondary to Intermuscular Lipoma: A Case Report

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ABSTRACT

Background: This report presents the case of a 68-year-old male patient with a 3-month history of progressive weakness of the left hand accompanied by symptoms of pain and dysesthesia radiating to the dorsal aspect of the forearm.

Case Report: Complete compression of the radial nerve and partial entrapment of the ulnar nerve secondary to the intermuscular lipoma were detected. Electromyography findings revealed prolonged motor and sensory latency of the radial nerve and reduced sensory conduction velocity in the distribution of the ulnar nerve. The pathological findings revealed nuclear atypia with no increased mitosis, hyperchromasia, pleomorphism, or multinucleation of fat cells. Total surgical excision of the intermuscular lipoma was performed with an anterior surgical approach. Optimal functional improvement in hand extension had been achieved at a 1-year follow-up evaluation.

Conclusion: Clinicians should be aware of the possibility of the entrapment of adjacent peripheral nerves by an intermuscular lipoma and its clinical and pathological manifestations.

Keywords: Entrapment, intermuscular lipoma, neuropathy, radial nerve, ulnar nerve

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INTRODUCTION

Lipomas are typically benign, subcutaneous, mesenchymal, adipose tissue tumors. However, a minority may occur in deeper locations under the enclosing fascia, including the intramuscular, intermuscular, intrathoracic, and retroperitoneal regions (1). Intermuscular lipomas can involve tissues deep inside the muscle and tissue between the muscles. The frequency among all benign adipocytic tumors is 0.3% to 1.9%. Pain is a late symptom, usually seen in deep-seated lipomas, and is most likely due to compression of the adjacent soft tissues, entrapment of the adjacent peripheral nerves, or neurological deficits due to nerve impingement (1). Compressive syndromes of the peripheral nerves can be difficult to diagnose, which can affect the patient's outcome. A differential diagnosis of nerve entrapment via intermuscular lipoma can prevent the misdiagnosis of idiopathic compressions and inappropriate surgical approaches (2). Peripheric nerve entrapment due to an intermuscular lipoma in the forearm can create radial nerve compression as a result of its anatomical relationship to the proximal radius (3). Intermuscular lipomas of the forearm and elbow joint are rare, and only a few cases have been reported in the literature (2, 4). This report presents a case with signs of complete compression of the radial nerve and partial entrapment of the ulnar nerve due to a deep-seated intermuscular lipoma in the left forearm.

CASE REPORT

A 68-year-old male patient presented at an orthopedic clinic with a 3-month history of progressive weakness of the left hand with symptoms of pain and dysesthesia radiating to the dorsal aspect of the forearm. The patient could not extend his fingers and metacarpophalangeal joints, and the grip strength of his left hand was diminished. The preoperative evaluation included a detailed neurological exam, electromyography (EMG)/nerve conduction velocity (NCV) (2- and 4-channel electromyograph; EMS Biomedical, Korneuburg, Austria) and pathology (hematoxylin and eosin stain). The clinical examination revealed a deeply embedded soft tissue mass in the left forearm (Fig. 1). Electrodiagnostic tests included radial sensory nerve conduction (SNC), radial motor nerve conduction (MNC), ulnar SNC, ulnar MNC, and needle EMG of the related muscles. The needle EMG examination included insertion sites for radial nerve and ulnar nerve innervated muscles both at the wrist and at the elbow in order to localize the lesion. Radial MNC was recorded from the extensor muscles of the forearm. The stimulation points were the proximal forearm, the groove between the biceps and brachioradialis muscles in the elbow, and the radial sulcus. The SNC of the superficial branch of the radial nerve was recorded between the extensor pollicis longus and extensor pollicis brevis muscles. The ulnar MNC and SNC included recording innervated muscles from C8–T1. The response amplitudes of the left radial nerve were reduced MNC (elbow) (latency 4.64 ms, amplitude

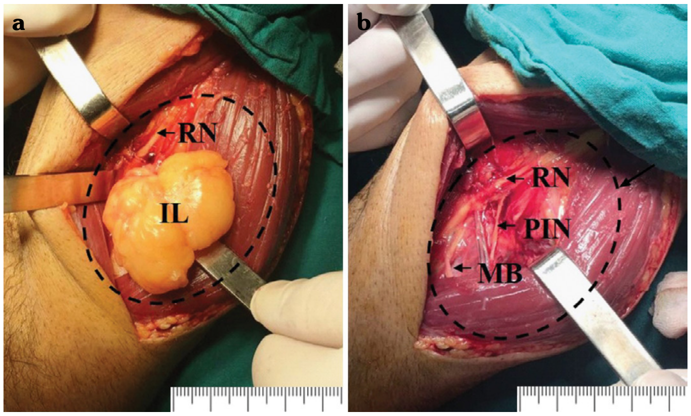

Figure 1. (a) An intraoperative image illustrating the RN constricted by the intermuscular lipoma. The arrows indicate the nerves and muscular branch at the level of the compression; (b) Postoperative image of the intermuscular lipoma. The nerves were carefully released, and the lipoma was removed. The RN and its deep branches were preserved without damage

IL: Intermuscular lipoma; MB: Muscular branch; PIN: Posterior interosseal nerve; RN: Radial nerve

3.44 mV, area 7.85 mVms); no amplitude could be obtained with SNC. The response amplitudes of the left ulnar nerve MNC were reduced (wrist) (latency 2.92 ms, amplitude 14.05 mV, area 24.83 mVms, distance 6 mm, interval 2.92 ms) (elbow) (latency 7.2 ms, amplitude 14.11 mV, area 25.09 mVms, distance 26 mm, interval 4.28 ms, 6.1 m/s NCV), and decreasing velocity of sensory nerves was observed with SNC (wrist) (latency 3 ms, amplitude 75.30 mV, area 18.73 mVms, distance 12 mm, interval 3 ms, 4 m/s NCV). The pathological findings were consistent with a diagnosis of an intermuscular lipoma of the forearm with a large, soft, lobulated, well-circumscribed, round mass of yellowish adipose tissue (dimensions: 4.5 x 3 x 2 cm). The nuclei of the intermuscular lipoma were flattened and peripherally localized. The non-capsulated intermuscular lipoma was examined and yielded no macroscopic evidence of fat necrosis or hemorrhage. The pathological findings revealed nuclear atypia with no increased mitosis, hyperchromasia, or pleomorphism of fat cells (Fig. 2). Following EMG/NCV and pathological confirmation, surgical resection was performed. An anterior surgical approach was used through the flexor compartment of the forearm and an incision was made between the brachioradialis and brachialis muscles in order to identify the distribution of the radial nerve. Once the fascia had been divided, the intermuscular lipoma was visible, located between the brachialis and brachioradialis muscles (Fig. 1). After the surgical resection of the lipoma from the adjacent soft tissues and nerve decompression, the patient had a complete return of neurological function within 3 months with no evidence of recurrence, and has returned to his former activities.

DISCUSSION

An intermuscular lipoma is a rare cause of adjacent peripheral nerve compression, but it has been known to affect the branches of the radial nerve (5). Allagui et al. (5) reported that an intermuscular lipoma led to the paralysis of the related muscles due to entrapment of branches of the radial nerve. Fletcher et al. (6) found 83% of intermuscular lipomas were of the infiltrative type, and 17% were of the well-defined type. Furthermore, 38% of the infiltrative subtype were located in the trunk, 20% in the head and neck, 18% in the upper limb, and 10% in the lower limbs. In contrast, 87.5% of the well-circumscribed type were located in the trunk and 12.5% in the head region. Leffert et al. (7) stated that the most frequent reason for excision was the presence of a gradually enlarging, soft, and resilient non-tender mass, despite the lack of signs of inflammation of the surrounding tissues. Yamamoto et al. (8) reported a case of compression of a deep branch of the radial nerve secondary to a lipoma in an asymptomatic patient where the pathological findings revealed a fibrous and adipose mass with nerve fibers within the mass.

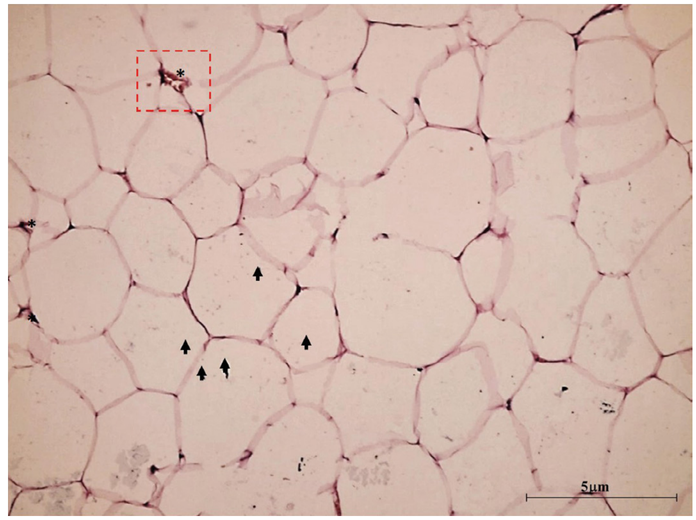

Figure 2. A photomicrograph showing the pathological appearance of the intermuscular lipoma. *Represents blood capillary (hematoxylin and eosin stain×400). Black arrows indicate the round, yellowish adipose tissue which is non-capsulated and displayed no macroscopic evidence of fat necrosis or hemorrhage. Nuclear atypia was seen, without evidence of increased mitosis, hyperchromasia, pleomorphism, or multinucleation of fat cells. The cytoplasmic vacuoles were relatively uniform

In the present case, we observed an encapsulated intermuscular lipoma with the deep branch of the radial nerve adhered to the outer capsular wall and partial degeneration of the ulnar nerve as well as pathological findings indicating nuclear atypia. There was no increased mitosis or multinucleation of fat cells. The location of the intermuscular lipoma and its relationship to the peripheral nerves intensified the patient's condition and made surgical excision difficult (9).

Entrapment of the radial nerve's deep branch due to intermuscular lipoma requires early diagnosis and a proper surgical approach for an optimal outcome. The best surgical approach depends on the lipoma's anatomical relationships and the distribution of the adjacent peripheral nerves (10). Patel et al. (10) reported that the anterior approach is the most frequently used, and it has been shown to have better outcomes. Therefore, an anterior surgical approach was performed in our case through the forearm's flexor compartment between the brachioradialis and brachialis muscles in order to achieve optimal recovery and save the branches of the adjacent peripheral nerves. Compression of the radial and ulnar nerves by an intermuscular lipoma of the forearm should be kept in mind when a patient has a history of progressive weakness or sensory changes in an upper extremity.

CONCLUSION

At a 1-year postoperative follow-up, the patient was seen to have full range of motion, no numbness in the posterolateral aspect of the forearm, and good grip power. Clinicians should be aware of the possible entrapment of adjacent peripheral nerves by an intermuscular lipoma and keep in mind the variables of recurrence risk, infiltration, deep localization, and varied clinical and pathological manifestations.

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