

## Lipoma and Wrist drop- A Case Report

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**Abstract:** Lipomas are usually subcutaneous and asymptomatic. Rarely, they can occur in a deeper soft tissue plane exerting pressure on adjacent nerves. When adjacent to the neck of the radius, it can cause posterior interosseous nerve compression. The radial nerve originates from the posterior cord of the brachial plexus with contributions from C5, C6, C7, C8 and T1. It enters the forearm just deep to the brachioradialis muscle and bifurcates into superficial and deep branches. The superficial branch provides sensory innervation to the skin on the dorsolateral surface of the hand. The deep branch becomes the posterior interosseous nerve (PIN) after emerging between the two heads of the supinator muscle. It supplies motor innervation to the muscles in the posterior compartment of the forearm. First described in the literature by Richmond in 1953 lipomas of the proximal forearm are an uncommon cause of PIN compression. Patients with PIN palsy caused by compression from a lipoma typically describe weakness of digital extension evolving over a period of several months. To date, fewer than 40 cases have been reported in English literature. We present a case of PIN compression by lipoma in a 40-year-old female.

**Keywords:** Intramuscular lipoma, Posterior interosseous nerve compression, radial nerve.

### INTRODUCTION

Lipomas of the proximal forearm are an uncommon cause of PIN compression and first described in the literature by Richmond in 1953[1]. Clinically, intramuscular lipomas are most often discovered during investigation of a painless swelling that may have been present for years. Intermuscular lipomas present as a painless slow-growing soft mass that is well-demarcated and not fixed to the skin. Proximal forearm deep lipomas adjacent to the neck of the radius can cause radial nerve compression, mainly of the posterior interosseous branch, with pain, paresthesias and or paralysis of finger extension [3-8].

In case of nerve compression, prompt removal of the compressing lipoma will usually restore normal function to the affected nerve [7], and [8]. In case of parosteal lipoma adjacent to proximal radius with posterior interosseous nerve compression, Fitzgerald [2] advocates a Henry's anterior approach as this allows both easier dissection of the lipoma and lessens the risk of trauma to the nerve and its muscular branches. The incision start just lateral to the tendon of the biceps muscle, curve slightly medially in the flexor crease of the elbow and follow distally the medial side of the brachioradialis muscle. After identifying and protecting the lateral antebrachial cutaneous nerve, incise superficial fascia and pass in the plane between brachioradialis laterally and flexor carpi radialis medially. After ligating the brachioradialis vessels, retract the radial artery medially and the brachioradialis

muscle with the superficial branch of the radial nerve laterally. The deep plane is constituted by the pronator teres muscle and the supinator muscle through which the posterior interosseous nerve passes around the neck of the radius on its way to the posterior compartment of the forearm. The entrance of the radial tunnel is constituted by the arcade of Frohse, which is the most common site of compression of the radial nerve motor branch [9]. The authors emphasize the importance of mobilizing the nerve after proper exposure of the nerve proximal and distal to the lesion, to ensure safe resection [10]. The attachment of the supinator muscle must be dissected from the radius forearm in full supination [7]. Early surgical exploration and excision of deep-seated lipomas in the proximal forearm is recommended, to avoid permanent damage to the posterior interosseous or superficial radial nerves [2].

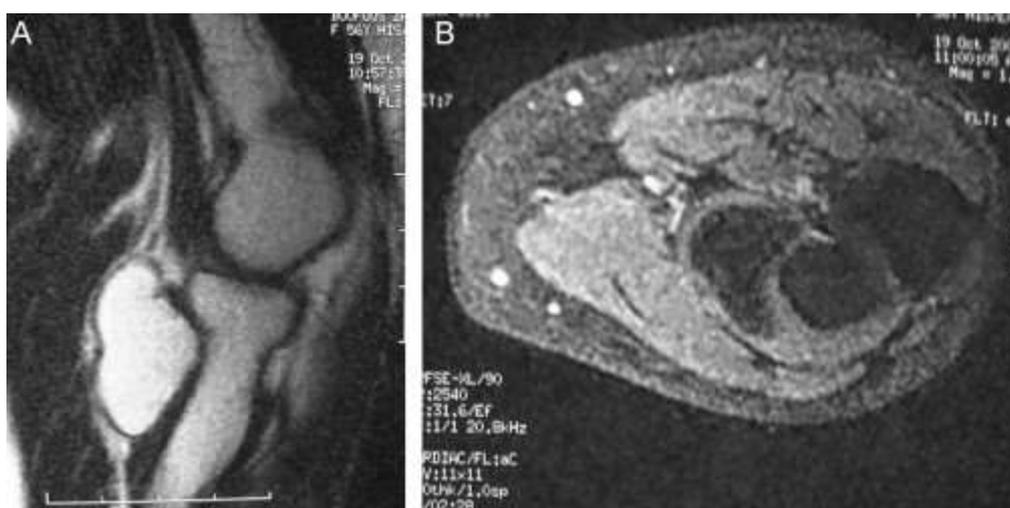
### CASE PRESENTATION

A 40-year-old female presented with a one-year history of pain in her right dorsal forearm shortly followed by the inability to extend her right fingers. Physical examination demonstrated a palpable mass in the proximal forearm. There was absence of extension of the right fingers. The patient also exhibited weakness of right wrist extension when compared with the left. There was no sensory deficit. There was no sensory deficit in the left upper extremity. Extensor digitorum muscle atrophy was visible. A soft tumour was palpable in the left proximal dorsal forearm, directly below the elbow joint.

Nerve conduction studies of the superficial radial, median and ulnar nerves were normal. Radial motor nerve conduction studies demonstrated a complete conduction block. MRI of the left elbow joint revealed a T2 hyperintense tumour approximately 4×2 cm in size infiltrating the supinator muscle and sheathing the radius and PIN (fig 1) The MR appearance was typical of an intramuscular lipoma.

#### TREATMENT AND COURSE OF THE DISEASE

The tumour was surgically removed. A curved incision was placed over the supinator muscle in the proximal third of the forearm; fascia and muscle were divided along a 4 cm course. Under the muscle, there was a lobulated lipoma, which was highly vascularised and well encapsulated. The nerve was found to run through the lipoma and was pressed against the distal border of the supinator muscle (fig 2) causing a massive depression. The tumour was composed of mature lipocytes without malignancy, confirming the diagnosis of an intramuscular lipoma. Patient recovered partial motor functioning after 3 months.



**Fig-1: MRI of elbow: Sagittal T1-weighted MRI demonstrates a fatty mass of high signal intensity involving the proximal forearm adhering to periosteum of radial neck and in contact with radial nerve. B: Axial T2-weighted MRI with fat saturated image shows the low signal intensity mass similar to the subcutaneous fat.**



**Fig-2: The nerve was found to run through the lipoma and was pressed against the distal border of the supinator muscle**

## DISCUSSION

To date, there have been limited reports of PIN compression caused by lipoma. While lipomas themselves occur commonly in subcutaneous tissue, it is rare to find them in deeper sites [2]. Other causes of nontraumatic paralysis of the PIN include entrapment by the fibrous edge of the supinator muscle [11,12], rheumatoid arthritis [13,14] and neuralgic amyotrophy [15]. Of these, entrapment by the supinator is by far most common [16].

Patients presenting with lipoma compression of the PIN will typically describe weakness of digital extension that is insidious in onset [2]. Other symptoms that should alert the clinician of the possibility of PIN compression include persistent, severe pain radiating from the forearm into the neck and back, as well as a profound sense of heaviness of the involved arm [17]. Detection of a mass in the proximal forearm usually occurs only upon seeking medical attention [2], as was the case with our patient. The vast majority of patients do not suffer any sensory disturbance; however, occasionally there is combined involvement of the superficial radial nerve resulting in accompanied sensory deficit [18,3,6].

Diagnosis is made on the basis of clinical findings and radiologic studies. Both x-ray and ultrasonographic studies can be useful in diagnosing PIN compression by lipoma. Magnetic resonance imaging, however, has proven most valuable in providing detailed soft tissue information as well as anatomical location [5,16]. Electromyography studies have also been used to identify the site of a nerve lesion [5].

Treatment of PIN palsy by lipoma is surgical decompression. Several approaches have been described in the literature. The anterior approach, first described by Henry in 1973 [19], involves dissection between brachioradialis and brachialis muscles. This allows for separation of the PIN under direct vision and is preferred to the posterior approach [2].

## CONCLUSION

Early excision of lipomas compressing the PIN is recommended, with two years being the longest reported duration of symptoms to surgery that resulted in full recovery [2, 20]. It is also important to ensure complete removal of the tumour because recurrence has been documented [2,21].

## REFERENCES

1. Richmond DA; Lipoma causing posterior interosseous nerve lesion. *J Bone Joint Surg Br*, 1953;35-B:83.
2. Fitzgerald A, Anderson W, Hooper G; Posterior interosseous nerve palsy due to

- parosteal lipoma. *J Hand Surg Br*, 2002;27:535-537.
3. Lidor C, Lotem M, Hallel T; Parosteal lipoma of the proximal radius: a report of five cases. *J Hand Surg Am*, 1992;17:1095-1097.
4. Bieber EJ, Moore JR, Weiland AJ; Lipomas compressing the radial nerve at the elbow. *J Hand Surg Am*, 1986;11:533-535.
5. Ganapathy K, Winston T, Seshadri V; Posterior interosseous nerve palsy due to intermuscular lipoma. *Surg Neurol*, 2006;65:495-496.
6. Moon N, Marmor L; Parosteal lipoma of the proximal part of the radius: a clinical entity with frequent radial nerve injury. *J Bone Joint Surg Am*, 1964;46:608-614.
7. Nishida J, Shimamura T, Ehara S, Shiraishi H, Sato T, Abe M; Posterior interosseous nerve palsy caused by parosteal lipoma of proximal radius. *Skeletal Radiol*, 1998;27:375-379.
8. Phalen GS, Kendrick JI, Rodriguez JM; Lipomas of the upper extremity: a series of fifteen tumors in the hand and wrist and six tumors causing nerve compression. *Am J Surg*, 1971;121:298-306.
9. Clavert P, Lutz JC, Adam P, Wolfram-Gabel R, Liverneaux P, Kahn JL; Frohse's arcade is not the exclusive compression site of the radial nerve in its tunnel. *Orthop Traumatol Surg Res*, 2009;95:114-118.
10. Flores LP, Carneiro JZ; Peripheral nerve compression secondary to adjacent lipomas. *Surg Neurol*, 2007;67:258-263.
11. Capener N; The vulnerability of the posterior interosseous nerve of the forearm: a case report and an anatomical study. *J Bone Joint Surg Br*, 1966;48:770-773.
12. Spinner M; The arcade of Frohse and its relationship to posterior interosseous nerve paralysis. *J Bone Joint Surg Br*, 1968;50:809-812.
13. Marmor L, Lawrence JF, Dubois EL; Posterior interosseous nerve palsy due to rheumatoid arthritis. *J Bone Joint Surg Am*, 1967;49:381-383.
14. White SH, Goodfellow JW, Mowat A; Posterior interosseous nerve palsy in rheumatoid arthritis. *J Bone Joint Surg Br*, 1988;70:468-471.
15. Furusawa S, Hara T, Maehiro S, Shiba M, Kondo T; Neuralgic amyotrophy. *Seikeigeka*, 1969;20:1286-1290.
16. Hashizume H, Nishida K, Nanba Y, Shigeyama Y, Inoue H, Morito Y; Non-traumatic paralysis of the posterior interosseous nerve. *J Bone Joint Surg Br*, 1996;78:771-776.

17. Efron CR, Beasley RW; Compression neuropathies in the upper limb and electrophysiologic studies. In: Thorne HC, translator. *Grabb & Smith's Plastic Surgery*. New York: Lippincott Williams & Wilkins; 1997; 830–3.
18. Tzeng CY, Lee TS, Chen IC; Superficial radial nerve compression caused by a parosteal lipoma of proximal radius: A case report. *J Hand Surg*, 2005;10:293–296.
19. Henry AK; *Extensile exposure*. 2nd edn. Edinburgh: Churchill Livingstone, 1973; 100–15.
20. Werner CO; Radial nerve paralysis and tumor. *Clin Orthop Relat Res*, 1991;268:223–225.
21. Fleming RJ, Alpert M, Garcia A; Parosteal lipoma. *AJR Am J Roentgenol*, 1962;87:1075–1084.