

Case Study

Intramuscular Abscess Causing Radial Nerve Palsy

ZF Zairul-Nizam

*Department of Orthopaedics, Faculty of Medicine and Health Sciences
Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia*

ABSTRACT

Radial nerve palsy is one of the commonest upper limb compressive neuropathies encountered in orthopaedic practice. More frequently associated with fractures of the humeri, it can also be the result of other atraumatic causes such as the so-called 'Saturday Night Palsy'. In this article, a case is presented where a palsy of the radial nerve was caused by the expansion of an intramuscular abscess in a patient with chronic renal failure. This is a relatively rare cause of radial nerve palsy that resolved progressively after surgical drainage.

Keywords: Radial nerve palsy, intramuscular abscess

INTRODUCTION

Compressive neuropathy of the peripheral nerves of the upper limb is a fairly common occurrence. This is especially true of the radial nerve due to its close relationship to the humerus. Having arisen as the larger terminal branch of the posterior cord, it subsequently winds around the humeral spiral groove between the medial and lateral heads of the triceps muscle. At a point just distal to the deltoid tuberosity, the radial nerve enters the anterior compartment of the arm by passing through the fibrous lateral intermuscular septum, in a deep position between the brachioradialis and brachialis muscles. At about the level of the elbow joint, as the nerve descends, it divides into its superficial and deep branches.^[1]

Possible points of compression causing radial nerve neuropathy in the arm include the stretch along the humeral spiral groove, the entry into the lateral intermuscular septum, and as it passes through the septum.^[1] While external compression to the nerve may arise from a variety of common enough causes^[2], paralysis of the radial nerve caused by an abscess formation within a nearby muscle bulk has yet to be described. We believe that ours may be the first such case.

THE CASE

A 34-year-old lady was referred to the Orthopaedic Unit for management of an abscess in the region of her left elbow. She was seen in the haemodialysis unit where she was being treated for chronic renal failure. A large abscess was noted on the lateral side of the distal aspect of her left arm. Apart from restriction of motion of her left elbow, there were no other ominous complications. Surgical drainage of the abscess was promptly performed and the patient started on appropriate antibiotics and dressings. Secondary suturing of the surgical incision was subsequently performed.

Several weeks later, the same patient was again referred. A tender swelling had formed on the anterior aspect of the left arm extending from mid-to-distal portions. The appearance of this swelling was associated with a sudden onset of weakness as well as loss of sensation involving her left wrist and hand. Clinical examination raised the probability of a new abscess formation. Examination also revealed features of a radial nerve compression comprising the classical wrist- and finger-drop as well as numbness of the anatomical snuffbox region. There was no evidence of either median or ulnar nerve involvement. The vascular supply to the left did not appear to be compromised.

An ultrasonography examination of the swelling revealed the presence of a large, multiloculated intramuscular abscess. However, the pathogenesis of the radial nerve compression was less clear. An MRI study was therefore performed. The MRI confirmed a large (14x2.9x5.6 cm) multiloculated abscess predominantly involving the brachialis muscle with associated inflammatory changes in the biceps and triceps muscles. The brachial artery and median nerve were displaced anteriorly while the radial nerve was seen embedded within the inflamed soft tissue on the lateral aspect of the abscess (*Fig. 1*).

Drainage of the abscess and exploration of the radial nerve was promptly performed. An antero-lateral incision was made beginning approximately 5 cm proximal to the elbow joint and a total of 200 mls of frank pus was evacuated. The radial nerve was found embedded within a cocoon of fibrous tissue throughout the length of the abscess bed. The surgeon managed to release the nerve intact.

Post-operatively, the numbness over the anatomical snuffbox was immediately alleviated. She was started on empirical antibiotics pending results of culture and sensitivity. Upon discharge two weeks after drainage, her motor function improved substantially. Full function is anticipated for this patient.

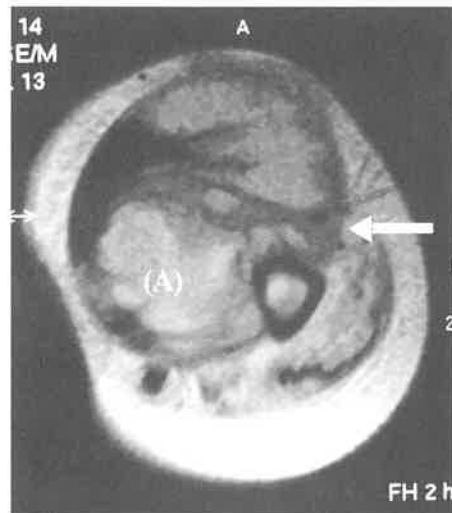


Figure 1. MRI image of intramuscular abscess (A) compressing the radial nerve (arrow).

DISCUSSION

It has been reported that there are six main causes of neuropathy of the radial nerve as it passes through the upper arm: fracture of the humerus (and/or its reduction), blunt injury, external compression, tourniquets, injections, and muscular causes.^[2] The radial nerve is particularly prone to external compression due to its close relationship to the humerus. Potential sites include the upper-medial side of the arm, spiral groove, and the distal lateral aspect of the upper arm (where it lies directly on bone and is superficially positioned). Causes of the external compression include the incorrect usage of crutches, weight of a sleeping partner's head (Honeymoon palsy) and draping of the arm over a chair while in drunken stupor (Saturday night palsy).^[3]

The so-called 'muscular' causes of radial nerve neuropathy are generally uncommon. It usually involves the triceps after strenuous arm exercise; when a fibrous arch in the lateral head of the triceps compresses the nerve as it passes through the distal portion of the spiral groove.^[3] However, Blackmer and colleagues described a situation where the triceps muscle was incriminated in a different light – where an acute radial neuropathy was associated with a 'fracture' of the muscle and a local nerve conduction block at the site of injury.^[2] Ng *et al.* on the other hand, described a case of a high radial nerve palsy caused by an extrinsic mass effect of a hypertrophied teres major in the triangular space. Surgical decompression provided lasting clinical resolution.^[4]

Our case was the only one found via internet search that specifically identifies an intramuscular abscess within the brachialis muscle as causing an external compression to the radial nerve. Being closely related to the radial nerve in the lower portion of the upper arm, such an expanding mass could easily cause an entrapment of the nerve as it leaves the intermuscular septum, a point when the radial nerve is still relatively fixed and immobile. Drainage of the abscess resulted in progressive alleviation of symptoms.

Due to the proximity in abscess locations as well as the short period of time in between occurrences, it is highly possible that closure of the first abscess wound may have led to a recollection of purulent material and compressive symptoms. With the benefit of hindsight, it is probably more prudent to allow self-granulation in patients who are so immunosuppressed.

REFERENCES

- [1] Pratt N. Anatomy of nerve entrapment sites in the upper quarter. *Journal of Hand Therapy* 2005; 18(2): 216-30
- [2] Blackmer JE, Vellet D, Zochodne DW. Isolated radial nerve palsy associated with fracture of the triceps: Case report. *Canadian Assoc. of Radiologists Journal* 2001; 52(5): 322-4
- [3] Anto C, Aradhya P. Clinical diagnosis of peripheral nerve compression in upper extremity. *Orthop. Clin.* 1996; 27: 227-36
- [4] Ng ABY, Borhan J, Ashton AR, Misra AN, Redfern DRM. Radial nerve palsy in an elite bodybuilder. *British Journal of Sports Medicine* 2003; 37(2): 185-6