CASE REPORT

VARIATION IN THE NERVE SUPPLY OF EXTENSOR CARPI RADIALIS BREVIS: A CASE REPORT
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ABSTRACT: AIM: To show the anatomical variation in the nerve supply of extensor carpi radialis brevis. RESULTS: The nerve to extensor carpi radialis brevis was found arising from the superficial branch of radial nerve, i.e. the radial nerve proper. CONCLUSION: The awareness of variation or nerve supply to extensor carpi radialis brevis from superficial branch of radial nerve is clinically important of surgeons, orthopaedicians, anaesthetists, physiotherapist & plastic surgeons to avoid damage to nerve during surgery and in interpretation of results.

KEYWORDS: Ercb, Suprficial radial nerve, Posterior interosseous nerve, Compression neuropathies, Orthopaedicians, Pain management therapy.

INTRODUCTION:
- Normally radial nerve proper supplies triceps, anconeus, brachioradialis, extensor carpi radialis longus.
- Extensor carpi radialis brevis is supplied by posterior interosseous nerve (deep branch of radial nerve along with supinator.

Fig. 1: Photograph showing radial nerve in the spiral groove
Fig. 2: Photograph showing the extensor carpi radialis nerve being supplied by deep branch of radial nerve.

RN – Radial nerve; S – Superficial branch of radial nerve; D – Deep branch of radial nerve; ECRL – Extensor carpi radialis longus; ECRB – Extensor carpi radialis brevis.
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AIM:
- To show the anatomical variation in the nerve supply to extensor carpi radialis brevis, found in routine dissection.

RESULTS:
- It is found that extensor carpi radialis brevis is supplied by branch of radial nerve (i.e) radial nerve proper in our dissected specimen.

DISCUSSION: The nerve supply to the extensor carpi radialis brevis muscle is studied by many authors in the past.\(^{(1,2,3,4,5,6)}\)

The standard text book did not mention about the nerve supply to the extensor carpi radialis brevis arising from the superficial branch of radial nerve i.e., the radial nerve proper.\(^{(7)}\)

The incidence of nerve supply to the extensor carpi radialis brevis muscle from superficial branch of radial nerve has been reported by,
- SALISBURY – 56.\(^{\circ}\%)\(^{(8)}\)
- AL-QATTAN – 48.\(^{\circ}\%)\(^{(9)}\)
- BRASH - 21\%.\(^{(10)}\)
- SHARADKUMAR ET AL - 42\%.\(^{(11)}\)
- Dhall, U. & Kanta, S. - 35\%.\(^{(12)}\)

In tennis elbow the muscle involves is the extensor carpi radialis brevis. The non-inflammatory, chronic degenerative changes occur in the origin of the extensor carpi radialis muscle.\(^{(13)}\)
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Knowledge of variant of the nerve supply to the muscle is important before injecting corticosteroid injection in the treatment of tennis elbow.\(^{(14)}\)

The surgeon performing z-shaped tenotomy on tennis elbow to lengthen the tendon must be aware of this variation in order to avoid unwanted complications.\(^{(15,16)}\)

The extensor carpi radialis brevis may be spared in injuries to the posterior interosseous nerve, thereby explaining the preservation of wrist functions clinically after penetrating injuries which may otherwise resulted in complete wrist drop.

Similarly the injuries to the superficial branch of radial nerve, which is supposed to be sensory nerve, may lead to pain during the extension of wrist and slight weakness on extension of the wrist joint due to involvement of the nerve supply of the ecrb.\(^{(17)}\)

Extensor carpi radialis brevis has gained importance for use in free functional muscle transfer. i.e., transfer of a muscle with its motor nerve and vascular pedicle, from one site of the body to another site to restore motor function.\(^{(18)}\)

The knowledge of the variation in the nerve supply is thus important while this muscle is being harvested.

It is well known that the normal origin & course of nerve to ecrb lies very close to posterolateral aspect of the radius, a frequent site of pathology, trauma & surgical procedures.\(^{(19,20,21)}\)

The anterior approach to elbow & variations in this approach are used frequently in surgical management of proximal radial fracture as well as variety of other pathologies.\(^{(22,23)}\)

**Phylogeny:** In lower mammals the extensor carpi radialis longus and brevis are represented by one muscle.\(^{(24)}\) Where as in humans extensor carpi radialis longus and brevis are separate muscles having separate nerve supply. Due to anatomical variation during development extensor carpi radialis longus and extensor carpi radialis brevis has been separated but their nerve supply has not been separated coming from only the radial nerve proper.

Hence the knowledge of variation of the nerve supply of extensor carpi radialis brevis is essential in preventing injury to this nerve branch by retractors.

Thus the awareness of the nerve supply to extensor carpi radialis brevis from the superficial branch of radial nerve is clinically important for surgeons dealing with entrapment or compression neuropathies.

Orthopaedicians operating on fracture of lower end of humerus.

Anaesthetists performing pain management therapies on upper limb.

Physiotherapists doing electromyography for evaluating and recording electrical activity produced by skeletal muscle.

Plastic surgeons performing free functional muscle transfer.

**CONCLUSION:** The nerve supply to the extensor carpi radialis brevis from superficial branch of radial nerve is not a rare occurrence.

This should be mentioned in the standard text books.

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