Pronator quadratus muscle

Pronator quadratus is a square shaped muscle on the distal forearm that acts to pronate (turn so the palm faces downwards) the hand.

As it is on the anterior side of the arm, it is innervated by a branch of the median nerve, the anterior interosseous nerve (roots C8 and T1 with T1 being primary). Arterial blood comes via the interosseous artery.

The anterior interosseous branch courses with the anterior interosseous artery and innervates all the muscles of the deep group of the anterior compartment of the forearm except the medial (ulnar half,which is supplied by ulnar nerve) half of flexor digitorum profundus and flexor carpi ulnaris muscle. It ends with its innervation of pronator quadratus muscle.

In C5 to C8 root injuries of the brachial plexus, transfer of the motor branch of the pronator quadratus to the extensor carpi radialis brevis can restore active wrist extension, and pronation is preserved [1)]. Twenty-eight patients, averaging 24 years of age, with C5-8 root injuries underwent operations an average of 7 months after their accident. In 19 patients, wrist extension was impossible at baseline, whereas in 9 patients wrist extension was managed by activating thumb and wrist extensors. When these 9 patients grasped an object, their wrist dropped and grasp strength was lost. Wrist extension was reconstructed by transferring the pronator quadratus (PQ) motor to the extensor carpi radialis brevis (ECRB) motor branch. After surgery, patients were followed for at least 12 months, with final follow-up an average of 22 months after surgery.

Successful reinnervation of the ECRB was demonstrated in 27 of the 28 patients. In 25 of the patients, wrist extension scored M4, and in 2 it scored M3.

In C5-8 root injuries, wrist extension can be predictably reconstructed by transferring the PQ motor branch to reinnervate the ECRB [2)].

Transfer of the proximal flexor digitorum superficialis (FDS) branch of median nerve to the extensor carpi radialis brevis (ECRB) muscle (ECRB branch) of radial nerve could be an alternative method for reconstructiing wrist extension in C5, 6, and 7 avulsion injuries [3)].

1)
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2)
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3)
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