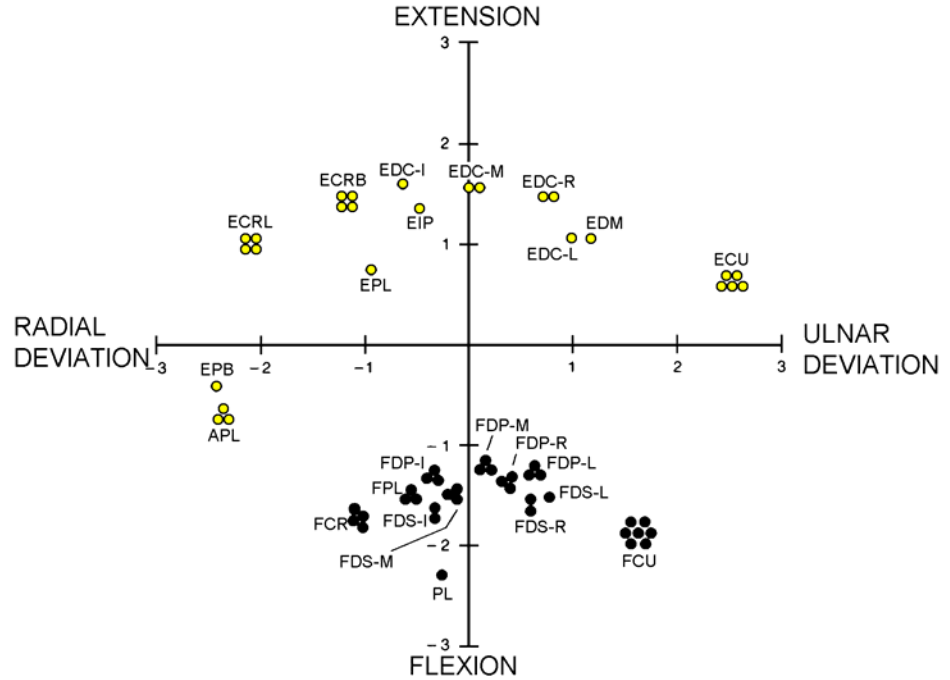


RADIAL NERVE PALSY

Problem
 42% loss of power across wrist
 Loss of wrist, finger, thumb extension
 Loss of grip
 Closure of first web-space

Mechanics



General
 Many surgical options for restoring digital extension
 Consider synergism, amplitude and muscle power
 If surgery must be delayed, consider a stabilizing wrist splint

Compatibility	FL	Mf	Tf
PT	5.1	5.6	5.5
ECRB	6.1	5.1	4.2
PL	5.0	1.2	1.2
EPL	5.7	1.5	1.3
FCU	4.2	5.6	6.7
EDC	4.9-5.9	5.4	5.5

RADIAL NERVE PALSY

Finger Extension

FCR to EDC	<p>Well suited for finger extension</p> <p>Uses same incision as for the pronator and brachioradialis transfer</p> <p>Less donor site morbidity than FCU transfer</p> <p>Proper tension should allow for a tenodesis effect, so that the MCPJ will have full extension when the wrist is placed in mild extension. Alternatively, holding the wrist in 20 deg of extension, should keep the MP joints at 0 deg flexion</p> <p>Typically this transfer is performed prior to transfers of the pronator teres</p>
Technique	<p>Tendon is transferred through the interosseous membrane (which maximizes length and provides optimal direction of pull)</p> <p>Sequentially attach the tendons of the EDC to the FCR, starting with the little finger and ending with the index finger</p> <p>After all of the tendons have been anchored into place, the fingers should maintain a normal cascade and the normal tenodesis effect of the wrist and fingers should have been restored</p> <p>FDS is another option (for long and ring fingers)</p>
FCU to EDC	<p>May be used for both low and high radial nerve palsy</p> <p>FCU muscle fibers are short (3 cm of excursion) which is not optimal for finger extension (5 cm of excursion)</p> <p>Transfer of FCU leaves no ulnar stabilizing unit of the wrist</p>
Technique	<p>Harvest tendon off its insertion into the pisiform</p> <p>Proximal portion of the tendon is mobilized, and then FCU is mobilized dorsally through the interosseous space and subcutaneously to reach the EDC</p> <p>FCU is woven into the EDC only after the PT has been transferred to the ECRB</p>
EPL Deficit	
BR to EPL	<p>Can only be used in low palsies in which there is at least 4/5 function of the BR</p> <p>Can be performed through the same incision as the pronator and FCR transfers</p> <p>Typically this transfer is performed after the FCR to EDC transfer</p>
PL to EPL	<p>Tendon rerouted to EPL</p> <p>PL also been used to restore thumb abduction</p>

RADIAL NERVE PALSY

Wrist Extension Deficit

General	Often one of the major complaints following radial nerve injuries Lack of power grip due to inability to stabilize the wrist
PT to ECRB	A standard method for restoring wrist extension PT will continue to function as a pronator Transfer often performed at the time of nerve repair
Technique	Small longitudinal incision over the insertion of the PT tendon on the volar radial aspect of the forearm Harvest the insertion along with 2 cm of adjacent periosteum Tendon is passed subcutaneously over the brachioradialis tendon until it reaches the ECRB Tendon is woven into ECRB with enough tension to hold the wrist in mild extension

APL Deficit

General	In a low radial nerve palsy, PT can be transferred to the APL, however, in a high radial nerve palsy PT is used to restore wrist extension
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Choices

Low Palsy	Loss of EDC, EPL, APL FCU ► EDC PL ► EPL* PT ► APL
High Palsy	Loss of EDC, EPL, APL, BR, ECRL/ECRB FCU ► EDC PL ► EPL (reroute) PT ► ECRB

References	AG Bevin. Early transfer for radial nerve transection. Hand. Vol 8. p 134. 1976. R.W. Beasley Tendon transfers for radial nerve palsy. Orthop Clinics of North America. Vol 1: p 439. 1970. Apparent weakness of median and ulnar motors in radial nerve palsy. J. Hand Surg. Vol 11-A. 1986. p 528. JC Colditz Splinting for radial nerve palsy. J. Hand Therapy. Vol 1(1) p 18. 1987. FB Thomas. An improved splint for radial (musculospiral) nerve paralysis. JBJS. Vol 33-B. 1951. p 272.
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RADIAL NERVE PALSY

Exercise

Transfer exercise PT ► ECRB ± ECRL reroute

FCU ► EDC

PL ► EPL*

*If no PL, EPL can be included with the finger extensors

The FCU tendon is transected from the pisiform and detached as far proximally as the incision will allow. The second incision begins 2 inches below the medial epicondyle. The remainder of the fascial attachments to the muscle are incised.

The PT muscle and tendon are passed subcutaneously around the radial border of the forearm to be inserted into the extensor carpi radialis brevis (ECRB) muscle just distal to its musculotendinous junction.

The FCU muscle is pulled into the dorsal wound. The line of pull must be as straight as possible from the medial epicondyle to the extensor digitorum communis (EDC) tendon just proximal to the dorsal retinaculum.

The extensor pollicis longus (EPL) muscle is divided and rerouted toward the volar aspect. The PL tendon is transected at the wrist and detached proximally to allow a straight line of pull between the PL and EPL tendons.

The PT tendon is then sutured to the ECRB tendon. The FCU transfer is then sutured. The PL muscle is rerouted to the EPL tendon.

