Fabrication of Orthosis for Low Ulnar Nerve Injuries and Combined Low Median and Ulnar Nerve Injuries

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Purpose of the Orthosis

The purpose of the orthosis is to assist with positioning the thumb & digits in a purposeful posture due to the loss of muscle balance needed to assist with an increase in the functional grip, pinch, prehension and opposition needed for ADL independence.

Ulnar Nerve

Ulnar innervated muscles involved in a low or wrist level lesion:
- Abductor digiti minimi
- Flexor digiti minimi
- Opponens digiti minimi
- Lumbricales to the 4th & 5th digits
- Dorsal & Palmar interossei
- Flexor pollicis brevis (deep head)
- Adductor pollicis

Ulnar Nerve Deformity

Claw Deformity
Froment’s Sign

Ulnar Nerve Sensory Loss
- Loss of sensation to the volar surface of the ulnar aspect of the palm distally and the volar surface of the small and ulnar half of the ring finger

Ulnar Nerve Functional Loss
- Grip and pinch are affected
- Loss of finger abduction and adduction
- Inability to flex the 4th & 5th MCP joints while simultaneously extending the IP joints
- Decrease in grip strength
- Loss of fine prehension

Materials Needed:
- Polyform
- 1” velcro hook and loop
- Bonding solution
- 3” stockinette
- Splint pan
- Scissors
- Heat gun
Orthosis Fabrication of a Low Ulnar Nerve Injury

Begin with 2 strips of thermoplastic between 6-8” in length.

Fabrication

Using the longer strip of thermoplastic, mold the volar, palmar bar clearing the DPC and secure dorsally with a strap.

Fabrication

Mold the MP block component over the P1 region of the 4th and 5th digits.

Volar view with fingers flexed

Anti Claw Orthosis for a Low Ulnar Nerve Injury
**Median Nerve**

Median innervated muscles involved in a low or wrist level lesion:

- Opponens pollicis
- Abductor pollicis brevis
- Flexor pollicis brevis (superficial head)
- 1st & 2nd lumbricales

**Median Nerve Deformity**

- “Ape Hand”
- Flattened thenar eminence
- Thumb lying to the side of the palm
- Loss of opposition & palmar abduction
- Loss of 1st web space

**Median and Ulnar Nerve Sensory Distributions**

Sensory loss involves the volar surface of the thumb, index, long and radial border of the ring fingers, and the dorsal surface of the distal phalanges of the thumb, index, long and radial border of the ring fingers.

**Orthosis Fabrication of a Combined Ulnar & Median Nerve Lesion**

Begin with 2 strips of thermoplastic ~ 8-10” in length

**Mold the palmar, volar bar while clearing the DPC**
Fabrication

Apply the dorsal strap to secure the palmar bar.

Fabrication

Next, mold the digital block component over the P1 region of the digits and secure to the volar piece. Be sure not to block full flexion of the index & small MCP joints.

Dorsal View

Make a thermoplastic ring to be worn over the thumb P1 region. Bond the thumb piece to the HB volar bar with a small strip of thermoplastic material.

Volar view with thumb component attached. The thumb is positioned to allow for prehension tasks.

Side View

Anterior & Volar View
Orthosis for a combined low median & ulnar nerve injury

Thank You