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**ABSTRACT** Background: The palmar cutaneous branch of the median nerve is one of the main branches of median nerve that can easily get injured during open carpal tunnel release. Knowledge of the variations of the median nerve at the wrist is significant for the surgical treatment of the carpal tunnel syndrome.

**Aim:** 1.To study and trace the anatomic course of palmar cutaneous branch of the median nerve.2.To analyse the variations of palmar cutaneous branch of the median nerve.3.To assess the other sensory nerve contributions to the palm. 4.To analyse the post operative sequelae following accidental division of palmar cutaneous branch of median nerve in carpal tunnel release.

**Materials and Methods:** This study was conducted in Department of Plastic surgery and Department of Anatomy, Coimbatore Medical college. Study Period: August 2007 to June2010. 24 hands of 12 cadavers were dissected. The incision was made from mid-forearm, extending vertically up to distal wrist crease. The incision turned towards the ulnar aspect of thumb. The palmar cutaneous branch of the median nerve was identified between the tendon of flexor Carpi radialis and Palmaris longus. The variations and other sensory nerve contributions were noted. The findings were recorded, photographed and tabulated.

**Conclusion:** PalmarCutaneous branch of Median nerve is not present as it is described in text books. It is not a constant branch of Median nerve and mainly supplies thenar eminence. So, accidental division of Palmar Cutaneous Branch of Median Nerve may not cause sensory loss in the palm as there are additional contributions from branches from median nerve and common digital nerves.

KEYWORDS : Carpal tunnel syndrome, Palmar cutaneous branch of median nerve

#### **Background:**

Carpal tunnel syndrome (CTS) is the most common compressive neuropathy of the median nerve at the wrist. In patients with carpal tunnel syndrome, the median nerve under the flexor retinaculum is tightly packed with the long flexor tendons of the fingers with their surrounding synovial sheaths. The decompression of median nerve by sectioning the transverse carpal ligament (flexor retinaculum) is well accepted as the treatment of choice for patients with carpal tunnel syndrome. The palmar cutaneous branch of the median nerve was one of the main branches of median nerve that can easily get injured during open carpal tunnel release.Knowledge of the variations of the median nerve at the wrist is significant for the surgical treatment of the carpal tunnel syndrome.

## AIM:

- 1. To study and trace the anatomic course of palmar cutaneous branch of the median nerve.
- 2. To analyse the variations of palmar cutaneous branch of the median nerve.
- 3. To assess the other sensory nerve contributions to the palm.
- To analyse the post operative sequelae following accidental division of palmar cutaneous branch of median nerve in carpal tunnel release.

# Materials and methods:

This study was conducted in Department of Plastic surgery and Department of Anatomy, Coimbatore Medical college. Study Period: August 2007 to June2010. **24 hands of 12 cadavers were dissected.** The incision was made from mid-forearm, extending vertically up to distal wrist crease. The incision turned towards the ulnar aspect of thumb. The incision was deepened. The palmar cataneous branch of the median nerve (PCBMN) was identified between the tendon of flexor Carpi radialis and Palmaris longus (PL) and then was picked up. Each PCN was identified using blunt dissection, and was traced proximally to its intraneural origin from the median nerve. Each PCBMN was then carefully dissected distally, dividing the skin overlying its course and tracing individual branches radially, and towards the ulnar side until its termination in

the under surface of the skin. The variations and other sensory nerve contributions were noted. The findings were recorded, photographed and tabulated.

## Results:

ANALYSIS OF CADAVER DISSECTION(12 cadavers -24 hands)We analyzed in detail the anatomical distribution of the PCBMN in adult's cadavers (10 male, 2 female). The palmar Cutaneous branch of Median nerve was present only in 11 out of 24 hands. The Palmar Cutaneous branch of Median nerve was absent on both hands in 3 bodies. It was present bilaterally only in two bodies. In 7 out of 12 bodies, it was present unilaterally (in 5 it was present on right side & in 2 it was present on left side). In cadavers, palmar cutaneous branch was present in 11 hands and additional contributions from branch directly from Median nerve in 4 hands, branch from median nerve and common digital nerve F2, F3 in 3 hands, branch from common digital nerve F1, F2 in 3 hands, branch from common digital nerve (CDN) F2, F3 - one hand. In cadavers where median nerve was absent in 13 hands, the sensory contribution was from median nerve in 9 hands, branch from median nerve and common digital nerve F2, F3 in 2 hands, branch from median nerve and common digital nerve F3, F4 in 2 hands. The Palmar Cutaneous branch of Median nerve could not be traced beyond thenar eminence in all the cases. In no case, it was divided into medical & lateral branches as described in anatomy text books. Our cadaver dissection revealed that palmar cutaneous branch of median nerve was present in 11 hands out of 24 hands. In 12 cadavers dissected, the palmar curaneous branch was present bilaterally in only 2 bodies. Present unilaterally in 7 bodies. The nerve was totally absent on both sides in 3 bodies. Usually the palmar cutaneous branch of median nerve passes superficial to flexor retinaculum. In our cadaver dissection, in 5 cases it was passing superficial to flexor retinaculum. In two cases passed deep to flexor retinaculum. It was adherent to flexor retinaculum in 2 cases. It passes directly to Thenar eminence in two cases. In cadevers, Palmar cutaneous branch was present in 11 hands and additional contributions from a branch directly from Median nerve in 4 hands, branch from median nerve and common digital nerve F2, F3 in 3 hands, branch from common

digital nerve F1, F2 in 3 hands, branch from common digital nerve (CDN) F2,F3 - one hand.In cadavers where median nerve was absent in 13 hands, the sensoty contribution was from median nerve in 9 hands, branch from median nerve and common digital nerve F2, F3 in 2 hands, branch from median nerve and common digital nerve F3, F4 in 2 hands.





Picture:1.Body No:1 .Left hand PCBMN present

#### **Discussion:**

In 1972, Carroll and Green called for attention of the possibility of PCBMN damage as a source of painful dyseasthesia following surgery for carpal tunnel syndrome. Talies in recommended a curved longitudinal incision located on the ulnar side of the long axis of the ring - finger ray. Hobbs concluded that the incision on the transverse carpal ligament should be located on the ulnar side of the long axis of the middle finger to prevent damage to the PCN. These studies have influences surgeons to shift their incisions more toward the ulna in the interthenar area. Neuroma of the PCBMN is a common complication of anterior wrist surgery after carpal tunnel decompression. To avoid injury to the PCN, a comprehensive evaluation of its distribution in the wrist region is essential. The sensory innervations of the palm proximal of the radial 3 1/2 fingers is by the Palmar Cutaneous branch of Median nerve. This branch of Median nerve arises about 5 cm proximal to the flexor retinaculum passes superficial or deep to it. It divides into medial & lateral branches. The lateral branch innervates the Thenar eminence. The medial branch innervates the palm proximal to index, middle & radial half of the ring finger. Hence, in carpal tunnel syndrome there is no sensory disturbance of the palm and the sensory disturbance is confined only to the radial 3 1/2 fingers. This is the accepted view, at present. In Carpal Tunnel Syndrome, the Palmar Cutaneous branch of Median nerve was not affected; if it passes superficial to flexor retinaculum.. We did not find the Palmar Cutaneous branch of Median nerve in any recently operated cases. To understand this, we analyzed in detail the anatomical distribution of the PCN in adult cadavers (10 male, 2 female). The Palmar Cutaneous branch of Median nerve was present only in 11 out of 24 hands. The Palmar Cutaneous branch of Median nerve was absent on both hands in 3 bodies. It was present bilaterally only in two bodies.In7 out of 12 bodies, it was present unilaterally (in 5 it was present on right side & in 2 it was present on left side). In cadavers, palmar cutaneous branch was present in 11 hands and additional contributions from branch directly from Median nerve in 4 hands, branch from median nerve and common digital nerve F2, F3 in 3 hands, branch from common digital nerve F1, F2 in 3 hands, branch from common digital nerve (CDN) F2, F3 - one hand. In cadavers where median nerve was absent in 13 hands, the sensory contribution was from median nerve in 9 hands, branch from median nerve and common digital nerve F2, F3 in 2 hands, branch from median nerve and common digital nerve F3, F4 in 2 hands. The Palmar Cutaneous branch of Median nerve could not be traced beyond thenar eminence in all the cases. In no case, it was divided into medial & lateral branches as described in anatomy text books. Palmar Cutaneous branch of Median nerve could commonly be present unilaterally. It could even be absent bilaterally in some cases. If present, it is commonly found adherent to flexor retinaculum, either superficial of deep. Accidental division of Palmar Cutaneous branch of Median nerve may cause sensory loss confined only to thenar eminence. While making incisions & undermining skin on radial part of palm, one has to be careful not to injure sensory branches that may arise from common digital nerves.

Picture:2.Body No:1.Right hand PCBMN absent Palmar Cutaneous branch of Median nerve could commonly be present unilaterally. It could even be absent bilaterally in some cases. If present, it is commonly found adherent to flexor retinaculum, either superficial of deep. Accidental division of Palmar Cutaneous branch of Median nerve may cause sensory loss confined only to thenar eminence. While making incisions & undermining skin on radial part of palm, one has to be careful not to injure sensory branches that may arise from common digital nerves.

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**Conclusion:** 

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