



## RESEARCH ARTICLE

## CLINICO-ANATOMICAL CONSIDERATIONS OF PALMARIS BREVIS MUSCLE

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**Abstract**

The Palmaris brevis is considered to be rudimentary muscle included in category of panniculus carnosus. There is significant paucity in the literature regarding this muscle. Most standard textbooks mention the role of palmaris brevis in gripping, wrinkling of the skin on the ulnar side of the palm of the hand and deepening of the hollow of the palm and protection of the ulnar nerve and artery from overlying pressure. Musculocutaneous flap of palmaris brevis is used to reconstruct palmar thumb defects while turnover flap of this muscle in recalcitrant carpal tunnel cases has been very successful. The palmaris brevis is implicated in palmaris brevis spasm syndrome and hypothenar hammer syndrome. This study aims at providing a more accurate review about the palmaris brevis muscle and its clinical and surgical importance.

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**Introduction**

Palmaris brevis is a thin, quadrilateral muscle which lies beneath the skin of the ulnar side of the palm. It arises from the flexor retinaculum and the medial border of the central part of the palmar aponeurosis, and is attached to the dermis on the ulnar border of the hand. Palmaris brevis is superficial to the ulnar artery and the superficial terminal branch of the ulnar nerve. The arterial supply of Palmaris brevis is by branches from the superficial palmar arch. Palmaris brevis is innervated by the superficial branch of the ulnar nerve, (C8, T1). Palmaris brevis wrinkles the skin on the ulnar side of the palm of the hand and deepens the hollow of the palm by accentuating the hypothenar eminence. In this way it may contribute to the security of the palmar grip (Strandring, 2008).

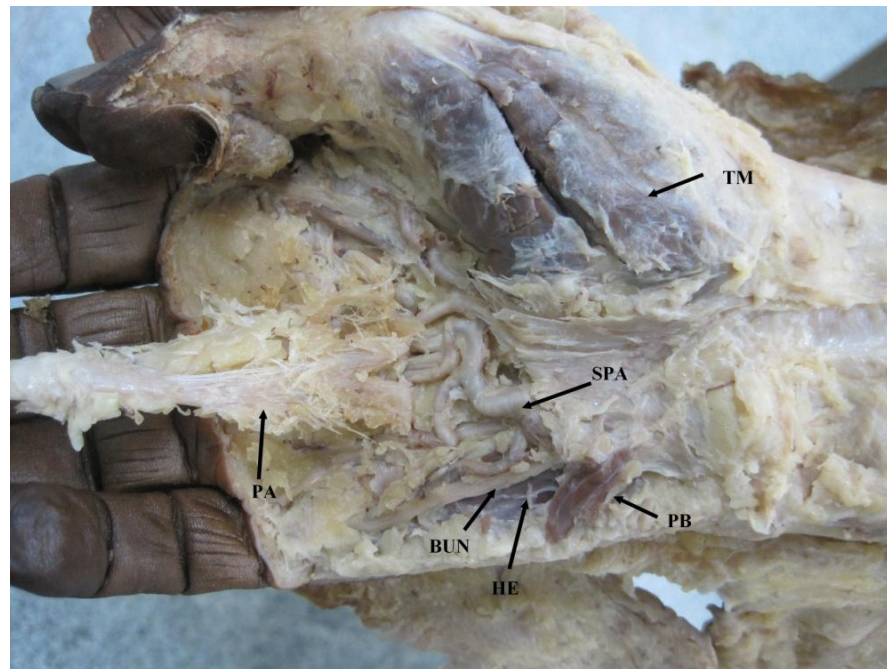
The function of the palmaris brevis is believed to be to protect the ulnar nerve and artery from overlying pressure. Contraction of the muscle helps in preventing displacement of the hypothenar pad by the pressure produced by gripping hard objects. As a result this pad of soft tissue is maintained over the ulnar neurovascular bundle and the risk of trauma to the nerve and artery from prolonged pressure is minimized considering the importance of this possible function the integrity of the palmaris brevis should be preserved while operating in area of palm (Shrewsbury et al, 1972).

Clinically Palmaris brevis is very important. It is involved in patients with sensory impairment of the ulnar nerve sparing the deep branch as seen in mild cases of cyclist or crutch palsy. It is also involved in palmaris brevis spasm syndrome (Chiou-Tan FY et al, 1998). Musculocutaneous flap composed of the palmaris brevis muscle and its overlying hypothenar skin is the free flap from the vascular pedicle of the ulnar artery which can be successfully used to reconstruct palmar thumb defects (Ueda and Inoue, 1994).

Considering the above clinical and surgical importance of palmaris brevis muscle, we present a review of anatomy, function and clinical importance of this muscle.

**Material and Methods**

For the preparation of this paper we consulted scientific articles published in English and textbooks. The articles were accessed from a basic search in PubMed database (<http://www.ncbi.nlm.nih.gov/pubmed>), using terms like Palmaris Brevis muscle, Palmaris Brevis Spasm, musculocutaneous flap etc.

**Figure 1- Palmaris brevis muscle**

Note -PB-palmaris brevis,TE-thenar eminence,HE- hypothenar eminence,SPA-superficial palmar arch(from ulnar artery),PA-palmar aponeurosis (reflected),BUN-branch of ulnar nerve

## Result and Discussion

Panniculus carnosus are thin sheets of striated muscles present in superficial fascia,deep to the panniculus adiposus. One end of muscles is inserted into skin while other end may be attached to deep fascia or bone. The panniculus carnosus is more extensive in lower animals. Palmaris brevis is included in panniculus carnosus along with platysma, ,dartos,muscles of face and scalp,corrugator cutis ani, subareolar muscles of nipple.

The patients with trisomy 13 show absence of palmaris longus, palmaris brevis, plantaris, and peroneus tertius along with the presence of pectorodorsalis muscles and muscles from the central tendon of the diaphragm to the pericardium near the pulmonary veins, and variations in the extensor indicis, extensor carpi radialis longus and brevis, biceps, and suprahyoid muscles (Colacino and Pettersen,1978).

Variations in arrangement of Palmaris brevis has been reported previously. Accessory fibres of palmaris brevis forms a sling around the ulnar artery.Contraction of these anomalous muscle belly may additionally compressed the artery, slowing down the arterial flow leading to thrombosis of the distal ulnar artery known as hypothenar hammer syndrome (HHS ) MRI-scan in such cases demonstrate an anomalous muscle at the level of the hamate hook located underneath the palmaris brevis forming a sling around the ulnar artery. The ulnar artery distal to the anomalous muscle showed dilatation with fibrotic thickening and intraluminal thrombosis. The involved ulnar artery segment has to be resected and grafting an interpositional vein is done. Risk factors are intensive golf playing with the grip style and repetitive movements leading to pressure injury of the hypothenar area and the underlying ulnar artery (Muller et al,1996).An anomalous Palmaris brevis muscle is also associated with ulnar nerve compression at the wrist. This anomalous muscle would appear to be a duplication of the palmaris brevis. This muscle has been named the "palmaris brevis profundus"(Tonkin and Lister, 1985). The compression of ulnar nerve can be relieved by excision of the muscle belly relieving both Guyon's and the carpal tunnels( Robinson et al,1989).The ulnar neuropathy shows positive palmaris brevis sign, in which intact palmaris brevis muscle shows excessive contraction.Palmaris brevis sign, when present, is useful in clinically localizing the site of the ulnar nerve lesion.( Iyer,1998)

The Palmaris brevis spasm is a rare muscular hyperactivity syndrome. The mechanism of the spasm restricted to the palmaris brevis muscle is unclear and the aetiology. The mechanism of the syndrome could be an ephaptic transmission possibly secondary to the transient and repeated stretching of the ulnar nerve superficial branch or a root compression can also be a cause. An EMG shows spontaneous high frequency discharges of normal motor units, without evidence of neuropathy or of nerve compression. This syndrome resembles other restricted muscle hyperactivity syndromes. The main clinical characteristics are frequency in older men, isolated contractions of the palmaris brevis muscle, spontaneous, brisk, irregular tonic contractions, dimpling in the ulnar side of the hand without stereotyped duration or frequency, usually no triggering factors, the patient is unable to initiate the contraction at will and the contractions start and stop without any apparent cause, the voluntary contraction of the little finger or a pressure on the pisiform could sometimes trigger the dimpling, benign evolution for several years, aggravation under stress or excitement, decrease at rest or during sleep, spasms are either bilateral or unilateral, there is no muscle hyperactivity in the hypothenar muscles or in any other muscle of the hand and sensory disturbances are inconsistent (Serratrice et al, 1995). The palmaris brevis (PB) spasm syndrome following prolonged use of a computer mouse and keyboard have been reported (Liguori et al, 2003).

The palmaris brevis musculocutaneous flap is one of the best donor regions to repair pulp defect of thumb. It is difficult to repair the pulp defect of finger with good function. The flap with proper ulnar vessels and the accompanying arterial branch and superficial branch of the ulnar nerve can be transferred to repair the pulp defect of the thumb. The vessels are anastomosed with the radial artery and cephalic vein at the snuffbox. The nerves are sutured to the digital nerve. The advantage of this flap is that, the donor area is painless and without sensation disturbance and functional loss (Xu et al, 1997).

The use of the palmaris brevis turnover flap in recalcitrant carpal tunnel cases has been successful. In failed cases of primary carpal tunnel release, the addition of the highly vascular palmaris brevis turnover flap as an adjunct to internal neurolysis discourages scarring and provides a nutrient bed for axonal regeneration. This the palmaris muscle flap may actually suppress the growth of nerve fibers into the overlying scar. The advantages of the palmaris turnover muscle are proximity of the muscle to the operative field, obviating the need for a distant graft source, negligible functional motor loss as a result of forfeiting this muscle, no separate scar is created in raising this flap and adequate padding of the subcutaneous fat is still left at the donor site to protect the ulnar neurovascular bundle. Although postoperative healing and rehabilitation time are relatively lengthened by this flap as a result of more extensive dissection, but pain relief and clinical improvements in grip strength, pinch strength and sensory parameters justify the use of the palmaris brevis turnover flap in such patients (Rose, 1996).

## Conclusion

We undertook this study with the aim of providing a more accurate report about the palmaris brevis muscle, because of association with palmaris brevis spasm syndrome, trisomy 13 or its importance in hand surgery as musculocutaneous flap. Finally, this study shall be useful for clinicians, surgeons and academics that manipulate and keep particular interest for this important muscle.

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## References

- 1 Chiou-tan FY, Reno SB, Magee KN, Krouskop TA (1998). Electromyographic localization of the palmaris brevis muscle. *Am j phys med rehabil.* 77(3):243-6.
- 2 Colacino SC, Pettersen JC (1978). Analysis of the gross anatomical variations found in four cases of trisomy 13. *Am J Med Genet.* 2(1):31-50.
- 3 G Serratrice, J P Azulay, J Serratrice, and J Pouget (1995). Palmaris brevis spasm syndrome. *J Neurosurg Psychiatry.* 59(2): 182-184.

- 4 Iyer VG (1998). Palmaris brevis sign in ulnar neuropathy *Muscle Nerve*. 21(5):675-7.
- 5 Liguori R, Donadio V, Di Stasi V, Cianchi C, Montagna P (2003). Palmaris brevis spasm: an occupational syndrome. *Neurology*. 60(10):1705-7.
- 6 Müller LP, Rudig L, Kreitner KF, Degreif J. Hypothenar hammer syndrome in sports. *Knee Surg Sports Traumatol Arthrosc*. 4(3):167-70.
- 7 Robinson D, Aghasi MK, Halperin N(1989). Ulnar tunnel syndrome caused by an accessory palmaris muscle. *Orthop Rev*. 18(3):345-7.
- 8 Rose EH (1996). The use of the palmaris brevis flap in recurrent carpal tunnel syndrome. *Hand Clin*. 12(2):389-95.
- 9 Shrewsbury M M, Johnson R K, Ousterhout D K (1972). Palmaris Brevis-A Reconsideration Of Its Anatomy And Possible Function. *J Bone Joint Surg Am*. 54(2):344-8.
- 10 Standring .S (2008). *Gray's Anatomy: The Anatomical Basis of Clinical Practice* 40th ed. New York: Churchill Livingstone. 2595-6.
- 11 Tonkin MA, Lister GD (1985). The palmaris brevis profundus. An anomalous muscle associated with ulnar nerve compression at the wrist. *J Hand Surg Am*. 10(6):862-4.
- 12 Ueda K, Inoue T (1994). The new palmaris brevis musculocutaneous flap. *Ann Plast Surg*. 32(5):529-34.
- 13 Xu Y, Li Z, Li Q(1997). Repair of pulp defect of thumb by free palmaris brevis musculocutaneous flap. *Chinese Journal of Reparative and Reconstructive Surgery*. 11(5):293-5.