

Palmar Cutaneous Branches of the Proper Digital Nerves Encountered in Dupuytren's Surgery: a Cadaveric Study

Hypothesis: We hypothesized that palmar cutaneous branches of the digital nerves (observed intra-operatively, diverging from the proper digital nerves towards the midline) are a constant anatomical feature (not previously described), and aimed to map the location of these nerve branches, in order to predict their position as an aid to surgery.

Methods: 10 fresh frozen cadaveric hands were examined. The A1 pulley and common digital nerves to each finger were identified. The proper digital nerves were traced distally, carefully noting any branches deviating towards the midline over the palmar aspect of the proximal phalanx. The distance from the midpoint of the proximal extent of the A1 pulley to the origin of the 1st palmar cutaneous branch of the digital nerve was measured. The length of each finger from the proximal midpoint of the A1 pulley was measured, allowing a ratio of the distance from the pulley to the 1st nerve branch to be calculated for each finger.

Results: Palmar cutaneous branches of the digital nerves over the proximal phalanx were found as a constant anatomical feature in all 40 fingers investigated. Each pair of palmar cutaneous branches converged to form a "chevron shape", and appeared to serve a dense concentration of Pacinian corpuscles. Distally, each proper digital nerve was found to have multiple smaller palmar cutaneous branches deviating towards the midline of the finger. The index finger radial border was found to have the greatest numbers of these. The mean distance from the A1 pulley base to the origin of the 1st palmar cutaneous nerve branch was 15.59mm (range: 15.21 – 16.12mm). The mean ratio of the 1st palmar cutaneous nerve branch origin to finger length was 1:5.25 (range 1:4.7 – 5.6) or as a mean percentage of finger length 19.1% (range 17.8 – 21.1).

Summary: During surgical dissection for Dupuytren's disease the proper digital nerves must be identified and protected. In our experience, the 1st palmar cutaneous nerve branches we identified can be mistaken for the proper digital nerve, especially when they are a similar calibre. This could lead to an inadvertent injury of the proper digital nerve. A previous study established the surface landmarks for the proximal edge of the A1 pulley¹. These landmarks and our data can predict the position of the potentially misleading 1st palmar cutaneous nerve branches of the digital nerves - facilitating safer surgical dissection.

¹ Wilhelmi BJ, Snyder N 4th, Verbese JE, Ganchi PA, Lee WP. Trigger finger release with hand surface landmark ratios: an anatomic and clinical study. *Plast Reconstr Surg.* 2001 Sep 15;108(4):908-15.