

THE ANATOMICAL COURSE OF THE PALMAR CUTANEOUS BRANCH OF THE MEDIAN NERVE, INCLUDING A DESCRIPTION OF ITS OWN UNIQUE TUNNEL

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In order to obtain a better understanding of the palmar cutaneous branch of the median nerve, dissections of 21 forearms from 12 fresh cadavers were done with loupe magnification. Discrete regions of potential surgical significance were identified, including an origin that can be as high as 11 cm proximal to the wrist crease, a radial position immediately after its origin so that it lies adjacent to flexor carpi radialis in the distal forearm, and the existence of an anatomical tunnel through the palmar aponeurosis.

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Variations in the anatomy of the nerves at the wrist have long been recognized to be of importance to the surgeon. The motor branch of the median nerve (Lanz, 1977; Kato et al, 1991) and the palmar cutaneous nerves of the ulnar (Engber and Gmeiner, 1980; McCabe and Kleinert, 1990) and median (Carroll and Green, 1972; Taleisnik, 1973) nerves have all received attention and are of surgical importance. The observation that the palmar cutaneous branch of the median nerve may have its own tunnel (Mackinnon and Dellon, 1988) prompted the present anatomical investigation.

MATERIALS AND METHODS

20 forearms from 12 fresh cadavers were dissected with loupe magnification. The median nerve was identified in the distal third of the forearm. The origin of the palmar cutaneous branch was identified and measured with respect to the radial styloid. The anatomical course of the palmar cutaneous branch was then investigated in a distal direction, continuing until it innervated the palmar skin.

RESULTS

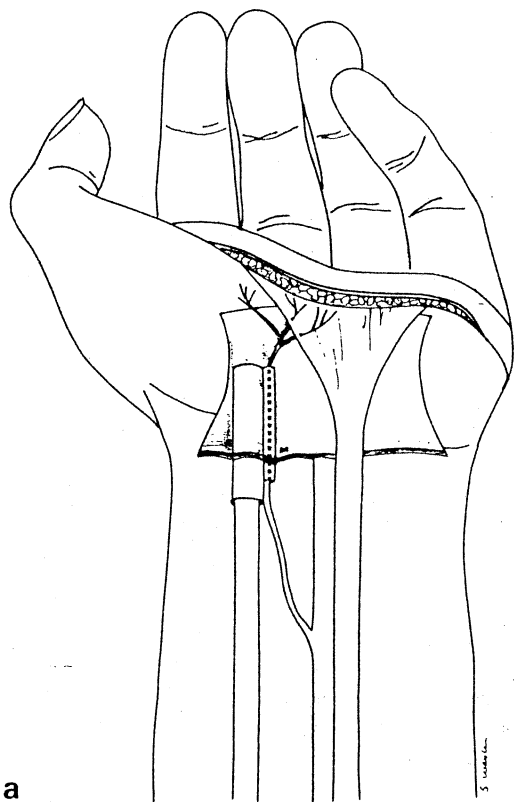
A consistent pattern was observed in all the specimens (Fig 1). The palmar cutaneous branch arose from the radial side of the median nerve and took an immediate radial course toward the tendon of flexor carpi radialis, travelling in the distal third of the forearm at a level deep to the antebrachial fascia. About 1.5 cm proximal to the tubercle of the scaphoid, the palmar cutaneous branch of the median nerve entered the fascial sheath and synovium of the flexor carpi radialis, in some specimens actually travelling within the substance of its sheath. At the tubercle of the scaphoid, it entered a separate tunnel within the superficial layers of the transverse carpal ligament. About 1.5 cm distal to the tubercle of the scaphoid, the palmar cutaneous branch of the median nerve pierced the palmar aponeurosis to innervate the palmar skin.

The origin of the palmar cutaneous branch from the median nerve was a mean of 5.7 cm proximal to the radial styloid, the greatest distance being 11 cm.

DISCUSSION

Previous studies have detailed the anatomy of the palmar cutaneous branch, in particular its distal anatomy in the palm and the overlap relationship with the radial and ulnar cutaneous nerves. The present anatomical study emphasizes the universal existence of a distinct tunnel through which the palmar cutaneous branch of the median nerve passes across the wrist crease. For 1.5 cm on either side of the tubercle of the scaphoid, the palmar cutaneous branch lies ensheathed sequentially within a fascial structure adjacent to flexor carpi radialis, the superficial layer of the deep transverse carpal ligament and beneath the palmar aponeurosis. Throughout this course, the palmar cutaneous branch of the median nerve is theoretically susceptible to entrapment or swelling related to direct contusion or the wound-healing sequelae of carpal tunnel decompression surgery.

The close proximity of the palmar cutaneous branch to the tendon of flexor carpi radialis suggests that tendinitis in this region may cause palmar pain. Following an injury to the hand or forearm with soft tissue swelling, patients may complain of symptoms referable to compression of the palmar cutaneous branch of the median nerve. The results of this study confirm the earlier observation (Mackinnon and Dellon, 1988) that in selected cases of pain related to the palmar cutaneous branch of the median nerve, when the surgeon is certain that there has not been a direct nerve injury with neuroma formation, relief may be obtained by decompression of this nerve rather than its resection. Clinically, the situation has been observed in 2 patients, whose symptoms were relieved after decompression of the palmar cutaneous branch in its tunnel.



a



b



c

Fig 1 Illustration of the anatomical course of the palmar cutaneous branch of the median nerve. (a) and (b) The tunnel through which the nerve passes is demonstrated. (c) The tunnel has been opened, revealing the nerve.

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