Palmaris Profundus Tendon Prohibiting Endoscopic Carpal Tunnel Release: Case Report

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Palmaris profundus is an aberrant muscle of forearm and wrist anatomy. It has no discernible function, but its tendon has been implicated as a cause of carpal tunnel syndrome. Previously, all cases of palmaris profundus in the literature have been encountered during either open surgery or cadaveric dissection. We report a case of palmaris profundus encountered during attempted single-portal endoscopic carpal tunnel release, necessitating conversion to an open approach. There was a unique point of tendon insertion onto the undersurface of the transverse carpal ligament, more proximal than what has been previously described in the literature. There were other anomalies present as well, including a persistent median artery and bifid median nerve. Given the volar position of the structure, its proximal point of insertion, and its minimal bulk, we did not feel that this was the cause of our patient's carpal tunnel syndrome. *(J Hand Surg 2012;37A:695–698. Copyright © 2012 by the American Society for Surgery of the Hand. All rights reserved.)*

Key words Anomalous tendon, carpal tunnel syndrome, carpal tunnel release, endoscopic carpal tunnel release, palmaris profundus.

THE PALMARIS PROFUNDUS is a rare anatomic variant of forearm and wrist anatomy. The origin of the palmaris profundus has been reported as "the deep fibro-osseous structures near the junction of the middle and proximal third of the palmar surface of the radius,"[1] although variations of this relationship have been noted, including origination from the common flexor mass, the flexor pollicis longus muscle, and the palmar fascia (reversed muscle belly).[2,3] The tendinous portion passes distally through the carpal canal, typically volar to the median nerve, and inserts on the undersurface of the palmar aponeurosis. Although the true incidence of palmaris profundus is unknown, cadaveric dissection of 530 limbs noted this abnormality in only 1 extremity.[4]

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Early reports documented the presence of a palmaris profundus tendon in the absence of a palmaris longus.[4,5] As a result, the palmaris profundus was initially felt to represent an anatomic variant of the palmaris longus. Later reports documented the occurrence of a palmaris profundus in the setting of an anatomically normal palmaris longus.[1–3,6–9] This has resulted in an improved understanding of the palmaris profundus as a distinct anatomic entity.

Case reports of palmaris profundus have described varying degrees of intimacy between the anomalous tendon and the median nerve. Although some authors have implicated the palmaris profundus as a cause of carpal tunnel syndrome (CTS),[5,7–9] others have debated this, believing instead that it represents only an aggravating factor[6] or an incidental finding.[10]

All prior reported cases of palmaris profundus have been encountered during either open surgery or cadaveric dissection. In all but 2 cases, this anomalous tendon has been discovered as an isolated anatomic variant at the level of the carpal canal.[3,9] We describe a case of palmaris profundus encountered during attempted single-portal endoscopic carpal tunnel release (CTR), necessitating conversion to open surgery. We found a unique point of tendon insertion, as well as the presence

of other anatomic variants, including a persistent median artery and bifid median nerve.

CASE REPORT

A 47-year-old, female office clerk presented to our clinic with a 2-year history of bilateral, left greater than right, progressive hand pain and numbness. She reported frequent sleep disturbance and worsening of her symptoms during daily work activities. Bilateral wrist splints and a corticosteroid injection into her left carpal tunnel provided minimal relief. Her past medical history was noteworthy for non–insulin-dependent diabetes mellitus.

Physical examination revealed thenar atrophy bilaterally, left greater than right, with 4/5 thumb abduction strength on the left and 5/5 strength on the right. Sensation to light touch was decreased bilaterally in the median nerve distribution with static 2-point discrimination ranging from 6 to 15 mm. By comparison, static 2-point discrimination was 3 to 4 mm in the ulnar nerve distribution bilaterally. Provocative maneuvers for CTS did not worsen her already constant symptoms. Provocative testing for ulnar nerve and cervical spine pathology was negative.

Electrodiagnostic testing confirmed bilateral median nerve compression at the wrist, without additional pathology. Bilateral median sensory latencies from the wrist to the index finger revealed no response. Median motor latency at the wrist was 6.2 ms on the left and 5.8 ms on the right. There were no EMG changes in the abductor pollicis brevis muscles. Because nonsurgical treatment options failed to provide sufficient relief, the patient wished to proceed with surgery.

We performed a left single-portal endoscopic CTR without difficulty. At her 9-day postoperative visit, the patient already had near-complete relief of her preoperative pain and was pleased with her outcome. Six weeks later, we proceeded with surgical release of the right side.

We made a 1-cm transverse incision, just ulnar to her palpable palmaris longus tendon and between the proximal and distal volar wrist creases. We dissected down to the antebrachial fascia, opened it transversely, and released the proximal portion longitudinally. Distally, we attempted to place a synovial elevator deep to the antebrachial fascia and the transverse carpal ligament (TCL) but encountered immediate resistance. The inability to pass our instruments precluded continuing safely, so we converted to an open procedure.

After identifying the median nerve proximally, we extended the skin incision distally and released the palmar fascia and the TCL in a longitudinal fashion. On deep dissection, we noted a completely bifid median nerve, a persistent median artery, and an aberrant tendinous structure attaching to the undersurface of the TCL at its proximal edge. Given its location and volar position, we determined that this had been the impeding structure during our attempted endoscopic CTR. The tendon was most consistent with a palmaris profundus (Fig. 1).

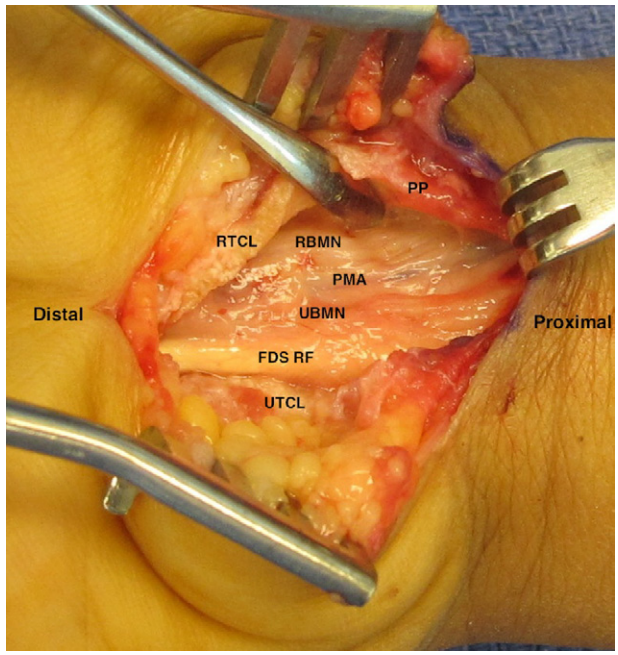

FIGURE 1: Volar view of the contents of the right carpal canal, demonstrating the palmaris profundus tendon, the persistent median artery, and the bifid median nerve. PP, palmaris profundus; RTCL, radial transverse carpal ligament; RBMN, radial branch of the median nerve; PMA, persistent median artery; UBMN, ulnar branch of the median nerve; FDS RF, flexor digitorum superficialis to the ring finger; UTCL, ulnar transverse carpal ligament.

We applied proximal traction to the aberrant tendon, which did not result in any noticeable digital or wrist flexion or any displacement of the palmaris longus tendon. We dissected proximally enough to identify that this was a discrete tendon, and that it was not causing direct compression of any neurovascular structure. More proximal dissection in the forearm was not clinically indicated, so we were unable to identify the definitive origin of the anomalous tendon.

The median artery was patent and did not appear to place any direct pressure on the bifid median nerve, so we left it *in situ*. The patient had an uneventful postoperative course, with complete resolution of her preoperative symptoms by her 2-week postoperative visit.