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Carpal tunnel syndrome caused by an anomalous palmaris profundus tendon

The carpal tunnel syndrome is the most common entrapment neuropathy in adults. Rarely, compression of the median nerve at the wrist may be caused by the presence of a tendon or muscle anomaly. Palmaris profundus, the tendon of which runs deep to the flexor retinaculum and inserts into the palmar aponeurosis, is an anomalous muscle arising from the fibrous tissue of the proximal portion of the forearm. As cited by Fatah (1984), it was first described by Frohse & Frankel in 1908. In an anatomical study of 1600 limbs, Riemann et al. (1944) found palmaris profundus in only 1 cadaver in which the associated absence of palmaris longus led to the conclusion that the former was an anatomical variant of the latter. Brones & Wilgis (1978) described 2 further examples of palmaris profundus. Dyreby & Engber (1982) reported a case of palmaris profundus causing the carpal tunnel syndrome in which the anomalous muscle was situated behind palmaris longus and, from its origin on the radius, passed through the flexor retinaculum. Fatah (1984) also described 2 cases of palmaris profundus associated with the carpal tunnel syndrome. In 1 of these cases a muscle bundle in the middle portion of the forearm was found when the dissection was extended proximally. Floyd & Burger (1990) published a case of bilateral carpal tunnel syndrome caused by bilateral palmaris profundus muscles coexisting with palmaris longus. We describe a further case in which tendons from both palmaris profundus and palmaris longus were present.

CASE REPORT

A 52-y-old right-handed male house-painter was referred to us with a 2 y history of bilateral pain and paraesthesiae, mainly at night, in the distribution of the median nerve. Examination revealed moderate hypaesthesia of median nerve distribution without muscle weakness or thenar atrophy. Tinel's sign was positive on percussion over the median nerve at the wrist and Phalen's test was positive bilaterally. The Gilliatt test (rapid induction of pain and paraesthesiae in the distribution of the median nerve produced by inflating a pneumatic cuff on the arm to a pressure above systolic) (Gilliatt & Wilson, 1953) was also positive within 15 s in the right hand and 20 s in the left. Median nerve conduction studies demonstrated a distal motor latency of 8.5 ms on the right and 7.9 ms in the left (normal range 2.5–3.8 ms from the wrist to the abductor pollicis brevis). A full blood count, erythrocyte sedimentation rate and rheumatoid factor antibody levels were within normal limits.

Initial treatment consisted of nonsteroidal anti-inflammatory medication and corticosteroid injections into the carpal tunnels. The symptoms persisted. Over a 3-month period both carpal tunnels were decompressed surgically by curvilinear palmar incisions. The left wrist was operated upon first and showed median nerve compression resulting from an enlargement of the flexor retinaculum and proliferative synovitis of the flexor tendon but with normal anatomical relationships between the palmaris longus, flexor digitorum superficialis and flexor digitorum profundus tendons. Histological examination of the synovial tissue indicated a chronic nonspecific synovitis.

In the right hand there was tendinous tissue that followed the radial margin superficial to the median nerve but which, at the entrance of the carpal tunnel, crossed over the median nerve from radial to ulnar side. At the crossover site the tissue appeared to adhere to the nerve and to compress it (Fig.) We elected not to continue proximal dissection of the tendon in the forearm although we believe that it originated at a considerable depth and was independent of the palmaris longus tendon. The distal portion of the tendon was inserted into the palmar aponeurosis. The anomalous tendon was resected and the clinical impression of tendinous tissue was confirmed by pathological examination of a 5 cm sample. Pain and paraesthesiae disappeared postoperatively.

DISCUSSION

Symptomatic compression on the median nerve independent of the palmaris profundus occurs frequently and, most commonly, in the carpal tunnel. However, there have been a few reports of median nerve compression caused by tendon of palmaris profundus. Some authors consider that it merely represents an anatomical variant of palmaris longus. This muscle is of interest because of its variable anatomy and because it does not exist in 15% of the general population (Reimann et al. 1944; Brones & Wilgis, 1978;

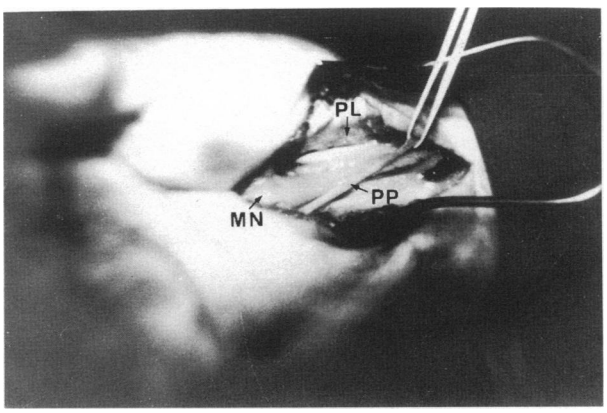

Fig. Photograph, taken during the course of the operation, of the palmar aspect of the right wrist showing the median nerve (MN) and the palmaris longus (PL) and the palmaris profundus (PP) tendons.

Dorin & Mann, 1984). Several variants of palmaris longus, as causes of carpal tunnel syndrome, have been published. These have been variously described as reversed (Dorin & Mann, 1984), digastric (Backhouse & Churchill-Davidson, 1975), duplicated (Meyer & Pflaum, 1987), bifid (Thomas, 1958; Schalafly & Lister, 1987), and bifid reversed (Muller, 1963; Still & Kleiner, 1973).

Except for the few cases previously mentioned, there are no reports of palmaris profundus coexisting with palmaris longus at the wrist. It is possible that, in our patient, this combination represents a bifid palmaris longus with one arm anomalously passing deep to the transverse carpal ligament. However, it seems unlikely that these two tendons had a common origin since traction on one did not cause excursion or relaxation of the other. We are convinced that this structure was the cause of the carpal tunnel syndrome because the median nerve was adherent to and compressed by it in this particular case. The precise point of origin of the palmaris profundus was not established since proximal dissection of the forearm was not continued electively.

Carroll & Montero (1980) reported a patient with the carpal tunnel syndrome caused by an anomalous muscle with a location and insertion similar to that of our patient but with the tendon proximal and the muscle belly distal. Their case may represent a 'reversed palmaris profundus' similar to the 'reversed palmaris longus' which was a cause of median nerve irritation as described by Still & Kleiner (1973).

The symptoms in the left wrist in our patients were alleviated by the surgical intervention to release the median nerve which had become compressed by an enlargement of the flexor retinaculum and by tenosynovitis. Although the flexor retinaculum was divided at both wrists the clinical improvement in both hands resulted from a resolution of similar symptoms arising from different aetiologies.

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