DE QUERVAIN'S DISEASE

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In 1897 de Quervain, who was then assistant to Kocher, first described the lesion at the wrist joint which now bears his name: "It appeared that the complaints were due to localised thickening of the tendon sheaths formed by the fibres of the dorsal carpal ligament and that the functional disorder was caused by increased friction at that point." It is extraordinary that half a century later we know little more than he did about the exact nature of the lesion. My interest in this condition was aroused because none of thirteen consecutive patients showed the normal anatomy as it is described in standard works.

ANATOMY OF THE SHORT EXTENSOR TENDONS OF THE THUMB

The extensor retinaculum, a thickening of the deep fascia, bridges the grooves on the dorsal aspects of the lower ends of the radius and ulna, and—being attached by deep processes to the ridges between them—converts them into six osteofibrous canals in which the various extensor tendons are contained. The first canal corresponds with the groove on the outer side of the lower end of the radius and contains the tendons of the abductor pollicis longus and extensor pollicis brevis. The abductor tendon is anterior to the extensor tendon and they are closely applied to one another. The dorsal cutaneous branch of the radial nerve pierces the deep fascia just proximal to the wrist joint. Its three branches, on their way to supply the thumb and radial half of the index finger, pass superficial to the first fibro-osseous canal.

The abductor pollicis longus is inserted into the radial aspect of the base of the first metacarpal bone and a ridge on the trapezium; it commonly gives off a slip to the abductor pollicis brevis. The extensor pollicis brevis is inserted into the dorsal aspect of the base of the proximal phalanx of the thumb. It is a muscle peculiar to Man and unlike the abductor is not generally represented in lower animals. It is truly in its phylogenetic infancy, as its separation from the abductor is complete only in Man and the gorilla. It has a very much smaller tendon than the abductor pollicis longus, a fact scarcely noticed in standard anatomy books. Occasionally it is absent, being represented only by a tendinous ligament passing from the radial styloid to the base of the first phalanx of the thumb.

Variations, especially in the tendon of the abductor pollicis longus, are very common. Forty-six cadavars have been examined in the dissecting room and Dr John Hicks, pathologist at Prince Henry's Hospital, Melbourne, has examined twenty post-mortem subjects, making a total of sixty-six. In fifty-two cases (79 per cent) the abductor pollicis longus was represented by two or more tendons. In sixty-two cases (94 per cent) the tendon of the extensor pollicis brevis was very much the smaller, in eight cases it was present only as a thin wisp of tendon, but in none was it absent. A single fibro-osseous canal is usual, but in twenty-two subjects (33 per cent) the extensor pollicis longus occupied a separate compartment.

The main tendon of abductor pollicis longus is usually cleft. The cleavage may be complete, forming two tendons of equal size; less frequently three or even four tendons are present. It was of interest to find that these divisions were inserted in the following ways: a) The divisions united opposite the base of the metacarpal and were inserted in the normal manner. b) In thirty cases (45 per cent) the more radial division gave off a slip to the abductor pollicis brevis, and in three cases (4.5 per cent) a slip appeared to pass to the opponens pollicis. The radial division was sometimes inserted directly into the abductor pollicis brevis without any attachment to the trapezium or the metacarpal. c) In three instances (4.5 per cent) a small
aberrant tendon was derived from a digastric abductor pollicis longus. Two of these tendons were inserted directly into the abductor pollicis brevis, and the third into the opponens. Such direct insertions should be remembered, for it can be disconcerting when attempting to identify the various tendons at operation to find that traction on one or more of them has no apparent effect on the thumb.

Similar variations from standard anatomical descriptions were noted by Wood in 1867, who found multiple abductor tendons in forty-nine out of seventy-two subjects (68 per cent), with insertions similar to those just described. He did not, however, describe two separate osteofibrous canals. These variations in the abductor tendon may represent a tendency towards further differentiation in the highly specialised human pollex.

Bunnell (1944) reported aberrant tendons in twelve out of twenty-two personal cases of de Quervain's disease. He attempted to differentiate between the lesions present in these twelve cases and the remainder, but found very little difference.

Etiology—No doubt the chief predisposing cause of de Quervain's lesion is crowding of the tendons as they pass over the radial styloid process. Angulation at this level in certain positions of the wrist increases the amount of friction between tendon, tendon sheath and bone. Thus, three lesions arising in women soon after confinement may have been due to continued use of the abducted thumb in holding the baby. In the only bilateral cases in the present series symptoms on the left side were precipitated by excessive use caused by immobilisation of the right wrist after the first operation.

Pathology—The operative findings are constant. The tendon sheath is thickened, sometimes for as much as one and a half inches, the greatest thickening being over the styloid process. Here it may be three to four times the normal thickness of 3 to 4 millimetres. The sheath may be almost cartilaginous in consistency. The synovial surface is often discoloured and may have lost its normal sheen. Filmy adhesions are usually present round and between the tendons, and extend above more than below the styloid process. Occasionally a small excess of fluid is present, especially in patients operated upon shortly after the onset of symptoms.

Histology—Microscopically the features are those of a non-specific chronic inflammatory process which varies greatly in degree. The synovial layer is much more cellular than is usual. The lining cells are often numerous and prominent, being polyhedral or columnar in form rather than flattened. There are areas of mucoid change most obvious round the blood vessels. The blood vessels are numerous and thickened, and this thickening is apparent in capillaries as well as in arterioles and venules. It must be noted, however, that blood vessels in and adjacent to synovial membrane are normally thicker than those in other tissues.

The perisynovial fibrous tissue shows increased cellularity and collections of small round cells, mucoid changes and sometimes small areas of cartilage formation (Fig. 1). The small round-cell accumulations are almost invariably perivascular in distribution. The adhesions are composed of a fine areolar connective tissue which in long-standing cases contains a few blood vessels (Fig. 2). In long-standing cases the synovial membrane may also show a great deal more collagenous material than usual.

**TREATMENT**

Conservative measures, including immobilisation in plaster-of-Paris, were found useless. In all thirteen cases excision of the thickened sheath gave complete cure with no recurrence. General anaesthesia and a tourniquet are used. An adequate skin incision is made in the line of the tendons with its centre over the tip of the radial styloid. To quote de Quervain: "Care must be taken not to damage the sensitive branches of the radial nerve which run across this area towards the dorsum." A seeker is passed proximally through the canal and the sheath is excised. All the tendons present are then identified and the whole sheath excised, including the partition between the two tendons if a second compartment is present.
Fig. 1
Photomicrograph (×104) of part of the tissue taken from thickened tendon sheath showing fibrosis, thickening of small vessels, and some mucoid change which appears as loose (but more deeply staining) tissue round the vessels.

Fig. 2
Photomicrograph (×104) of part of the tissue taken from an adhesion showing perivascular accumulation of wandering cells, fibrosis and increase in the number of blood vessels.
The excision is radical, extending above and below the radial styloid and including any adhesions that are accessible. After suture of the wound the thumb and forearm are immobilised in a light plaster for ten to fourteen days.

Several facts are worthy of comment: a) In no patient operated on was there any swelling or constriction of the tendons as they passed through the thickened sheath. b) In all but one of these thirteen patients the abductor pollicis longus was represented by two or more tendons. In the exceptional case there were two separate osteofibrous canals and the extensor pollicis brevis tendon was equal in size to that of the abductor pollicis longus. c) In two cases the tendon of extensor pollicis brevis was only a small wisp which passed through a separate osteofibrous canal. Once it was recognised only with difficulty, being completely obscured by four slips of abductor tendon. Had its tendon sheath not been identified and excised, symptoms would no doubt have persisted. These facts are of particular interest because they have a definite clinical application.

**Case Report**—A man was admitted to hospital suffering from typical de Quervain’s disease. He was operated on by a competent surgeon, who used local anaesthesia and a small “cosmetic” incision. The tendon sheath was exposed and incised; two separate tendons were seen. During the next year he obstinately refused to admit that he was cured. He complained of disagreeable paraesthesia over the thenar eminence and thumb and was finally suspected of malingering. At a second operation the tendon of abductor pollicis longus was found to be double (Fig. 3); the tendon sheath over it had obviously been incised and was causing no stenosis. The tendon of the extensor pollicis brevis, however, was abnormally large, passed through a separate osteofibrous canal, and was surrounded by a typically thickened synovial sheath, resection of which gave relief of symptoms.

**CONCLUSIONS**

1. In patients who develop de Quervain’s disease variations from the standard pattern of tendons at the wrist are the rule rather than the exception.
2. Conservative treatment is of no value.
3. Adequate exposure, allowing full recognition of all anatomical structures in the region, is advisable, but branches of the radial nerve must be treated with respect.
4. The extensor pollicis brevis tendon is normally small and may pass through a separate osteofibrous canal.
5. Though incision only of the stenosing tendon sheaths may be sufficient, thorough excision is more certain and does no harm.

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**REFERENCES**


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