

STENOSING TENDOVAGINITIS AT THE RADIAL STYLOID (DEQUERVAIN'S DISEASE)

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THE PURPOSE OF THIS PAPER is to call attention to the existence of a relatively common and extremely disabling condition, first described in 1895 by Fritz DeQuervain. My interest was aroused when, some five years ago, I encountered my first case of stenosing tendovaginitis at the radial styloid. In speaking to other surgeons of this condition I have been surprised to find that many were unaware of its existence. No credit is claimed for original observations, but it is felt that a useful purpose can be served by once again presenting the facts and thereby drawing attention to a disease entity which it seems is frequently overlooked.

DeQuervain's original article,¹ paints the picture so clearly that I shall quote from it at some length: "Although chronic disease involving tendon sheaths is most frequently construed as tuberculosis, there are types which neither from the clinical picture nor from the anatomic findings should be placed in this category. Among these may be mentioned tendovaginitis chronica sicca, tendovaginitis prolifera urica, and serous nontuberculous tendovaginitis. Chronic nontuberculous tendovaginitis has seldom called for surgical intervention, and is mentioned in most textbooks briefly, if at all. It, therefore, seems proper to discuss a condition which, although still belonging to the first type, tendovaginitis sicca, deviates in some important respects from the exact picture and in which surgical treatment has proved extremely beneficial. Through the kindness of Dr. Theodor Kocher I was given the opportunity to observe and to operate upon my first case when I was his assistant in the Surgical Clinic in Bern. Frau L., who occupied herself with housekeeping and woodgathering, noticed, in October, 1893, that the moving of her right thumb had gradually become painful. The pain was localized chiefly over the distal end of the radius and radiated up the forearm. The pain was sometimes so severe that she was unable to make grasping motions. There had been no swelling or other signs of inflammation. Despite massage with spirits of camphor and the application of heat, the pain had increased so that, in February, 1894, she came to the Surgical Clinic. The findings at her first visit were as follows: There was no sign of tuberculosis, syphilis or gout in the entire body. Motion of the right thumb was painful. Palpation revealed a slight thickening over the common sheath of the extensor pollicis brevis and abductor longus muscles. This sheath was keenly sensitive to pressure. There was no crepitation. It appeared that the condition might well result from a thickening of the sheath of the extensor pollicis brevis and abductor longus tendons, firmly encased as it is by the fibers of the dorsal carpal ligament, and that the functional

disturbances were due to increased friction in this region. Assuming a stenosis of the sheath, on March 7, 1894, under cocaine anesthesia, I removed the common sheath of the extensor brevis pollicis and abductor longus. The sheath was slightly thickened. Otherwise it appeared normal, as did the bone. Following operation there was no further pain and full use of the thumb returned in a few days. A report, March 7, 1895, stated that the patient had remained completely cured." DeQuervain described four similar cases, all promptly relieved by operation.

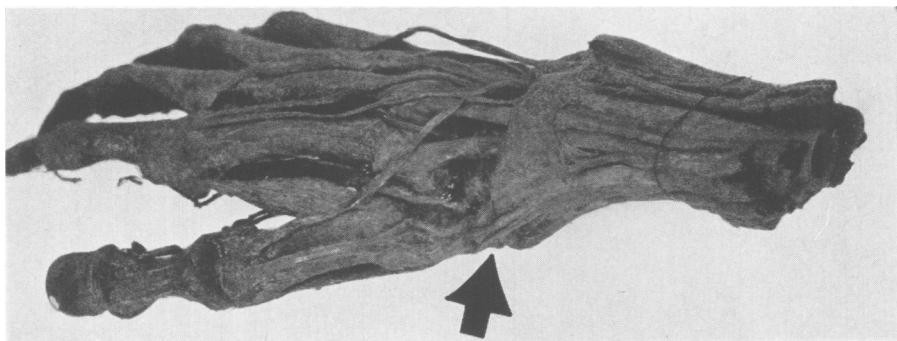


FIG. 1.—Shows the tendons of the abductor longus and extensor brevis pollicis passing upward beneath the dorsal carpal ligament. It is this portion of the ligament which is divided at operation.

DeQuervain's disease first appeared in American literature in 1927, in an article by Stein.² He reported five cases and described a similar condition involving the tendon of the extensor carpi ulnaris which passes through the fifth radial compartment. In 1928, Schneider³ reported 15 cases of his own, and referred to an article by Alfons Eschle, of Basle, who, in 1924, collected 110 cases from the foreign literature, to which he added 19 personal cases. In 133 of these cases, where the sex was known, there were 119 females and 14 males. In 1930, Finkelstein⁴ reviewed the subject thoroughly and added 32 cases from the Hospital for Joint Diseases. In 1935, W. M. Brown⁵ reported the first case to appear in the British literature. This patient was cured after 18 weeks in plaster. This was followed, in 1936, by an article by Burns and Ellis⁶ in the *Lancet*. They reported 28 personal cases. In the same year, Patterson⁷ reported six cases from the Bridgeport Hospital. In 1938, Keyes⁸ read an excellent paper before the Surgical Section of the New York Academy of Medicine. He reported one personal case, and referred to a second, a patient of another surgeon. This was an anesthetist who contracted the disease in his left hand as the result of gripping an ether mask for long periods of time. He continued his work while under treatment and within a short time the right hand became involved. In 1938, an article by Cotton, Morrison and Bradford⁹ appeared, and in the following year a report by Diack and Trommald.¹⁰ In 1941, C. F. Wood¹¹ stated that in a careful review of the literature he had been able to find 250 cases reported up to the year 1938. Inasmuch as some

confusion exists in regard to so-called "snapping finger" (*doigt à ressort*) and true stenosing tendovaginitis, I shall include two excellent references which fully describe the former condition—Compere,¹² and Zelle and Schnepf.¹³

The tendons of the abductor longus and extensor brevis pollicis pass through a shallow groove on the outer surface of the styloid process of the radius. The tendons at this point have a definite sheath which is in close contact with the dense fibers of the dorsal carpal ligament (Fig. 1). If the interphalangeal joint is flexed and the thumb actively abducted and

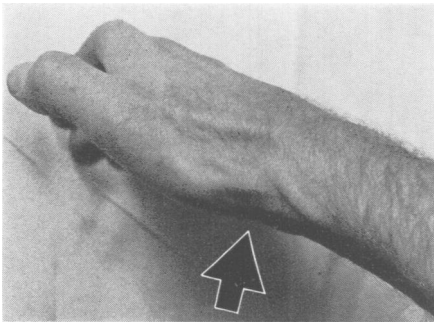


FIG. 2.—Shows the tendons of the abductor longus and extensor brevis pollicis. It will be seen that these tendons come together at an angle to pass upward beneath the ligament.

drawn toward the ulnar side it will be noted that the tendons of the abductor longus and extensor brevis pollicis, while lying parallel in the groove of the radius, thereafter promptly diverge toward their insertions, the base of the metacarpal and the base of the proximal phalanx of the thumb respectively (Fig. 2). It will likewise be noted that in full abduction these tendons exert a considerable pull on the distal end of the radial compartment, and that the direction of this pull is at right angles to the long axis of this compartment. The

tendon sheath is thus squeezed between the dorsal surfaces of the tendons and the dorsal ligament.

The exciting cause may be acute trauma. More frequently DeQuervain's disease is the result of sustained or oft repeated active adduction from a position of the extreme abduction.* The pathology found at operation varies. Most authors agree that there is a thickening of the sheath and of the overlying dorsal ligament, with a resulting constriction of the tendons. In some cases there have been signs of inflammation, as evidenced by the presence of fluid within the sheath and by a roughening of the tendon surfaces. In the writer's cases the outstanding finding was a marked thickening of that portion of the dorsal carpal ligament which overlies the sheath. This thickening decreased the diameter of the canal to such a degree as to interfere with the smooth action of the enclosed tendons. In one case there was a localized thickening of the ligament which had resulted in an hour-glass deformity of the tendons. It is possible that the primary pathology may well be limited to the dorsal ligament and that the variations from the normal which are encountered in the sheath and tendons are secondary to this. Sections

* Although the writer has not seen a report of stenosing tendovaginitis resulting from the operation of firearms, the causative factor is present in the handling of a gun over a prolonged period of time.

of excised ligaments have shown dense fibrous tissue with sometimes a mild degree of round cell infiltration.

The diagnosis is not difficult. The chief complaint is pain on moving the thumb. There is often a definite history of chronic trauma—bottle corking, piano playing, crocheting, boxing, and, in one of my cases, the holding of an artist's palette for hours at a time. There may or may not

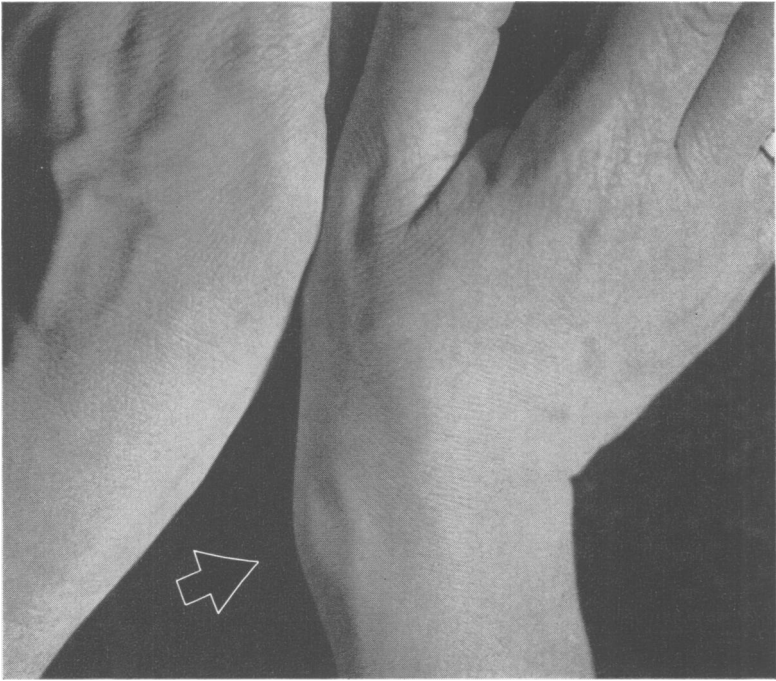


FIG. 3.—Shows deformity of right wrist caused by thickening of the dorsal carpal ligament. This is not a constant finding.

be discernible swelling in the region of the canal (Fig. 3). There is acute tenderness over the radial styloid. An excellent diagnostic sign, as pointed out by Finkelstein, is the following: The patient's thumb is placed in the hollow of the palm and grasped by the remaining fingers (Fig. 4). With the hand in this position even slight forced ulnar deviation at the wrist will produce excruciating pain. Roentgenograms are universally negative. Under differential diagnosis must be mentioned old fracture of the carpal scaphoid, fibrinous tenosynovitis involving the sheath of the extensor longus pollicis, rheumatoid and gonorrhoeal arthritis, "snapping finger," and sprain of the internal lateral ligament of the wrist joint.

Treatment consists in longitudinal division of that portion of the dorsal carpal ligament which overlies the sheath. This will in all probability be sufficient. In some cases which have been reported it has seemed wise to excise portions of the ligament or the sheath, or both. A few cures following conservative treatment (plaster of paris for from 6 to 18 weeks) have been

reported. Many have been treated conservatively, to no avail, and have subsequently been operated upon.

The technic is as follows: Under novocain anesthesia, and with or without a tourniquet applied to the upper arm, a longitudinal incision, one and one-quarter inches in length, is made. The lower end of this incision corresponds to the proximal and radial angle of the anatomical snuff box, and

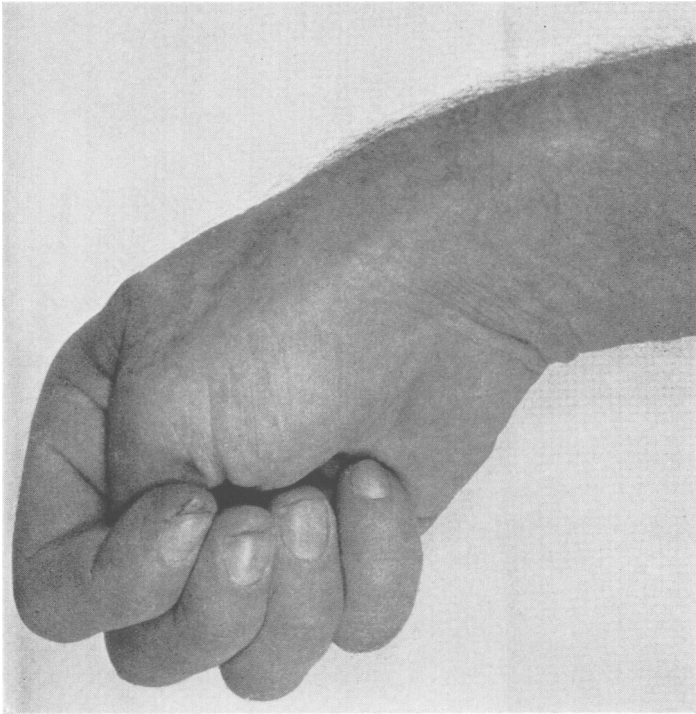


FIG. 4.—In stenosing tendovaginitis even slight, forced ulnar deviation with the hand in this position causes extreme pain.

is continued upward just to the ulnar side of the tendon of the flexor brevis pollicis. A small branch of the radial nerve and a vein, which cross the line of incision, must be recognized and avoided. A transverse incision may be employed at the level of the styloid process. This will result in a less noticeable scar, but care must be taken not to injure the radial artery. The dorsal ligament lies directly beneath the subcutaneous fat and that portion which covers the sheath is easily recognized when the thumb is forcibly abducted. The ligament is divided from above downward. This may be done by inserting the point of a No. 11 Bard-Parker blade beneath the upper edge of the ligament and cutting distally with the sharp edge away from the tendons. The contents of the canal can now be examined and, if thought necessary, a portion of the ligament, sheath, or both, can be excised. The superficial fascia is closed with fine silk or plain catgut and the skin with interrupted fine silk. It has been my custom to apply a light

basswood splint to be left in place for two or three days. This not only minimizes discomfort but hastens healing and is a safeguard against infection.

During the past five years I have operated upon eight cases of DeQuervain's disease, six at the Doctors' Hospital and two at Bellevue Hospital.

ABBREVIATED CASE REPORTS

Case 1.—Z. H. T. A woman, age 65. Duration of symptoms—six months. Causative factor—crocheting. Typical signs. X-ray negative. Operation May 25, 1937. Pathology—localized thickening of dorsal ligament at its center, producing hour-glass constriction of tendons at that point. Sheath thickened. Procedure—division of dorsal ligament.

Case 2.—J. H. A man, age 28. Duration of symptoms—three months. Causative factor—boxing. Typical signs. X-ray negative. Operation January 21, 1938. Pathology—thickening distal half of dorsal ligament. Slight thickening of sheath. Tendons normal. Procedure—division of dorsal ligament.

Case 3.—F. S. A woman, age 67. Duration of symptoms—three weeks. Causative factor—holding painter's palette for long periods of time. Typical signs. X-ray negative. Operation October 16, 1939. Pathology—diffuse thickening of dorsal ligament with thickening of sheath. Procedure—division of dorsal ligament.

Case 4.—L. P. A woman, age 38. Duration of symptoms—three months. Causative factor—undetermined. Typical signs. X-ray negative. Operation November 8, 1939. Pathology—diffuse thickening of dorsal ligament. Sheath thin-walled and contained a quantity of clear fluid. Tendons normal. Procedure—division of dorsal ligament.

Case 5.—A. G. A man, age 55. Duration of symptoms—one month. Causative factor—machine work. Typical signs. X-ray negative. Operation June 19, 1941. Pathology—diffuse thickening of dorsal ligament. Moderate amount of clear fluid in thickened sheath. Procedure—division of dorsal ligament.

Case 6.—G. A. A woman, age 50. Duration of symptoms—two months. Causative factor—housework. Typical signs with noticeable swelling over sheath. X-ray negative. Operation June 24, 1942. Pathology—diffuse thickening of dorsal ligament. Procedure—division of dorsal ligament. This patient is recovering slowly owing to an associated arthritis.

Case 7.—A. H. A woman, age 35. Duration of symptoms—seven months. Causative factor—stenography. Typical signs with noticeable swelling. X-ray negative. Operation July 31, 1942. Pathology—diffuse thickening of dorsal ligament with increased fluid within sheath. Procedure—division of dorsal ligament with excision of edges.

Case 8.—A. M. A nurse, age 30. Duration of symptoms—one week. Sudden pain developed in the process of drawing a sheet tightly across a bed. Typical signs. X-ray negative. The hand, wrist and forearm were immobilized for one month without benefit. Operation October 8, 1942. Pathology—moderate thickening of the dorsal ligament, thickening of sheath with excess fluid. Procedure—division of dorsal ligament.

CONCLUSIONS

DeQuervain's disease, or stenosing tendovaginitis at the radial styloid, is a relatively common but frequently overlooked condition. The symptomatology is definite. The surgical treatment is simple and uniformly successful. It is hoped by once again describing the outstanding characteristics of this disease that it will be more frequently recognized.

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