LESIONS OF THE FLEXOR CARPI RADIALIS TENDON AND SHEATH CAUSING PAIN AT THE WRIST

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Pain at the front of the radial side of the wrist or at the base of the thenar eminence is a common complaint. Conditions such as osteoarthritis of the first carpo-metacarpal joint, ununited fractures of the scaphoid bone and ganglia at the front of the wrist are easily recognised but the diagnosis may not be straightforward. Since 1952 we have operated on twelve patients who had pain from various lesions of the flexor carpi radialis tendon and sheath, and on one other in whom no abnormality was found. Seventeen other patients had pain with similar physical signs but their wrists were not explored. The whole group consisted of twenty-eight women between nineteen and seventy-eight years, eighteen being over fifty, and two men of fifty-four (Fig. 1).

![Age distribution chart](image)

**FIG. 1**

The incidence of lesions of the flexor carpi radialis tendon and its sheath.

**DIAGNOSIS**

Pain may be insidious in onset or may start suddenly after a direct or an indirect injury to the wrist. It is felt most at the front of the radial side of the wrist or at the base of the thenar eminence. It may radiate up the front of the radial side of the forearm or to the back of the radial side of the hand. It is often aggravated by movements involved in wringing or ironing clothes. Sleep is rarely disturbed and paraesthesiae are uncommon and mild.

Slight swelling may be seen over the tendon of flexor carpi radialis at the wrist, with tenderness at this point or over the front of the trapezium. Pain can always be produced by holding the patient's hand and resisting certain movements at the wrist. Pain is most often produced and is sharpest when pronation is resisted. It may be produced by resisting supination or palmar flexion but not by resisting dorsiflexion.
The injection of a small amount of local anaesthetic into the tendon sheath causes rapid but transient relief of pain. In radiographs of all but one of the women over the age of fifty there was osteoarthritis of the joint between the scaphoid and trapezium (Fig. 2). Evidence of this lesion varied from narrowing of the space between the bones, recognised by comparison of the two wrists, to gross sclerosis of the margins of the joints with narrowing and marginal osteophyte formation.

TREATMENT

Occasionally physiotherapy is effective. The injection of local anaesthetic and hydrocortisone into the tendon sheath causes considerable and lasting relief in a number of patients. If this treatment fails the tendon sheath and the roof of the fibro-osseous tunnel formed by the carpal ligament and the groove on the medial aspect of the trapezium are divided. This is most easily done under a general anaesthetic, and with a tourniquet. An S-shaped incision begun in the crease at the base of the thenar eminence, continued above the wrist, gives a good exposure and leaves an acceptable scar (Fig. 3).

Findings at operation—In three cases the tendon of flexor carpi radialis was frayed in the fibro-osseous tunnel and in one it was ruptured. In four cases there were adhesions between the tendon and the sheath. These adhesions extended down into the tunnel, and the tendon sheath was thickened. In one case the sheath was full of clear gelatinous material. In the two men the tendon sheath was red, thickened and adherent. In one patient no abnormality was found.

Eleven of the patients were satisfied by the results of the operation. One woman, in whom no abnormality was found, and one of the men continued to complain of pain.

Histological examination—In nine patients part of the tendon sheath was removed for histological examination. Synovial hyperplasia with proliferation of synovial cells and the formation of localised papillary projections was found in two (Fig. 4). Thinning of synovium, localised or generalised, was present in eight (Fig. 5). Hyperaemia of synovium or subsynovial connective tissue was present in all but one. The absence of any considerable inflammatory infiltration was noteworthy; only in two instances were substantial numbers of lymphocytes and plasma cells present and in one the fact that the cells formed focal aggregates suggested that this was a case of rheumatoid arthritis.

DISCUSSION

The number of cases in this series suggests that pain caused by lesions of the tendon and sheath of the flexor carpi radialis muscle may not be uncommon in women. In diagnosis the production of pain at the wrist by resisting selected movements of the hand and the transient relief of pain caused by injection of local anaesthetic into the tendon sheath are valuable tests when swelling at the wrist cannot be seen.
FIG. 4
The tendon sheath showing the formation of synovial papillary projections together with hyperaemia of underlying fibrous tissue and sparse perivascular infiltration of lymphocytes. (Haematoxylin and eosin, × 45.)

FIG. 5
Showing thickening and hyperaemia of the sheath with thinning and partial disappearance of synovial lining. (Haematoxylin and eosin, × 45.)
That evidence of osteoarthritis of the joint between the scaphoid and the trapezium bones should have been found in all but one of the women over the age of fifty is surprising (Fig. 6). To assess the normal incidence of this condition radiographs of the wrists of 100 women over fifty years of age attending orthopaedic and fracture clinics were examined.

Osteoarthritic changes were seen in twenty-four (Fig. 7). While osteoarthritis of this joint may have contributed to the development of lesions in the tendon and sheath of flexor carpi radialis, it is unlikely to have been the cause of pain, because division of the sheath relieved the symptom. The existence of an opening from the joint into the tendon sheath found both at operation and in necropsy specimens suggests that products of degeneration released from the joint were responsible for the adhesions.

Adhesions may develop in women who never complain of pain. Kaplan (1945) reported the findings on dissection of 100 wrists. He described four variations of the insertion of the flexor carpi radialis tendon: 1) insertion into the trapezium; 2) insertion into the trapezium and scaphoid bones; 3) insertion into the metacarpals; and 4) insertion into the carpal ligament.

From our own dissections of a number of necropsy specimens we believe that these anomalous insertions are really pathological adhesions.

In one of the women who had frayed tendons it was seen at operation that the groove on the medial aspect of the trapezium was narrowed by osteophytes. Disintegration of the tendon may have been caused by compression or by attrition of the tendon as described by Vaughan-Jackson (1948). Fraying or rupture of the tendons was accompanied by swelling of the tendon sheath visible at the wrist, but swelling was not seen in patients who only had adhesions.

The histological appearances were on the whole comparable with the findings of de Quervain (1895), Finkelstein (1930) and Williams (1963). In his original paper on stenosing tendinitis of the abductor pollicis longus and extensor pollicis brevis tendons, de Quervain (1895) described the synovial surface as being intact and the surrounding fibrous tissue as being somewhat thickened without evidence of fresh inflammation such as round-cell infiltration. Finkelstein (1930) noted that in mild cases the synovial membrane was thickened.
except at the point of constriction where it was thin or entirely absent. The loose connective tissue he found thickened and vascularised. In severe cases the synovial layer was completely destroyed and there was thickening of the vessels and heavy lymphocytic infiltration. Williams (1963) on the other hand in his description of chronic non-specific tenovaginitis of tibialis posterior tendon found that the fibrous sheath was thickened and oedematous and that the synovial membrane was thickened with villous proliferations. There were proliferation of synovial cells and round-cell infiltration.

In two instances in our series there was considerable inflammatory change, and in one the histological appearances were similar to those complicating rheumatoid arthritis as described by Kellgren and Ball (1950). In the material examined from the other six patients the inflammatory exudate was slight or absent and the outstanding features were hyperaemia of the sheath and thinning of the synovium.

**SUMMARY**

1. Pain at the front of the radial side of the wrist may be caused by various lesions of the tendon and sheath of the flexor carpi radialis tendon.
2. The diagnosis may be established by testing resisted movement at the wrist and by the effect of injecting local anaesthetic into the tendon sheath.
3. In women over the age of fifty the lesion is associated with osteoarthritis of the joint between the scaphoid and the trapezium.
4. Osteoarthritis of the joint between the scaphoid and the trapezium is found in about 25 per cent of women over the age of fifty.
5. If the pain is not relieved by simple conservative measures it can usually be cured by incision of the tendon sheath.
6. The histological changes in the tendon sheath are similar to those found in tenovaginitis of the abductor pollicis longus and tibialis posterior tendons.

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**REFERENCES**