Flexor tenosynovectomy in the rheumatoid finger

The usual operation for stenosing flexor tenosynovitis is resection of the proximal pulley. In the rheumatoid hand this operation may not be proper because motion still may be limited by the thickened synovium more distally, and also because there is a greater chance for the production of ulnar drift later on if the proximal pulley system is obliterated. The operation we recommend for the finger with rheumatoid tenosynovitis is a tenosynovectomy, but with maintenance of the pulley system and resection of one slip of the superficialis in order to decompress the digital sheath. We have performed this operation on 54 fingers with satisfactory results.

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Flexor tenosynovitis in the rheumatoid finger may cause pain, triggering, or limitation of motion.

If conservation measures fail, operation is indicated. The usual procedure for stenosing tenosynovitis in the nonrheumatoid finger is decompression of the digital sheath by division of the proximal pulley. In the rheumatoid hand this procedure may not be proper because motion still may be limited by the thickened synovium in the area of one of the more distal pulleys, and also because there is a greater chance that ulnar drift will result after the tendons are released from the proximal pulley system.

The pathomechanics of ulnar drift in rheumatoid arthritis are not understood completely. Most agree that first there is metacarpophalangeal synovitis, causing loss of dorsal, radial, and volar support. The digit then is left vulnerable to the potentially deforming forces acting on the hand. One of these forces is the flexor tendons. Smith has outlined a convincing case of involvement of the flexor tendons combined with synovitis of the metacarpophalangeal joints as the prime factor in the production of ulnar drift.

The key to the destructive effect of the flexor tendons at the metacarpophalangeal joint is the large forces they transfer to the collateral ligaments of the joint. During pinch or grasp, the tendons make a volar and ulnar bend at the mouth of the flexor tunnel and they are prevented from “bowstringing” by the sling arrangement of the collateral ligament system (Figs. 1 and 2).

In addition, Flatt found that a definite increase in ulnar torque occurred when the proximal tendon sheath was cut and the flexor tendons were allowed to shift in an ulnar direction (Fig. 2). The operation for trigger finger or tenosynovitis which releases the flexor tendons from their sheath increases the chance of creating ulnar drift in the rheumatoid hand. In 1960 Riordan warned against resection of the pulley system in the rheumatoid hand for this reason.

Because of these observations we have developed a different approach to flexor tenosynovitis and trigger finger in the rheumatoid hand. The pulley mechanism should be left intact. Tenosynovectomy is accomplished by excision of the sheath between the pulleys, and the contents of the flexor sheath are further decreased by resecting the ulnar slip of the superficialis. The finger should be explored up to the distal interphalangeal joint because of the possibility of triggering in this area, as seen in Fig. 3.

In 1958 one of the authors (M.L.C.) operated on a hand with marked flexor tenosynovitis of all four fingers, causing limitation of motion. A tenosynovectomy of the flexor tendons of these fingers was performed, but because the flexor tendons to the index finger were so involved, the superficialis was excised completely. This patient was examined 10 years after this procedure and, although all fingers were improved markedly, the finger with the best result, without crepitation, catching, or limitation of motion, was the finger where the superficialis was removed.

After this observation in 1970, we started using the following operative procedure for symptomatic tenosynovitis in the rheumatoid finger.

Surgical technique

Wrist block or intravenous lidocaine anesthesia is used to allow assessment of active flexion after the
Fig. 1. Uninvolved hand showing the position of the pulleys and synovial sheaths in the fingers.

tourniquet is lowered. A volar zigzag incision is made from the middle phalanx into the palm. A tenosynovectomy is carried out. The pulleys are trimmed but left as far proximal as possible. A pulley over the proximal interphalangeal joint is preserved, although the remainder of the sheath usually is excised. The ulnar slip of the superficialis then is detached from its insertion and removed as far as the palm, being certain that the cut end will not catch on the proximal pulley. The digit then is checked to see that the remaining contents of the sheath will glide smoothly, before the skin is closed. Motion is started on the second or third day.

Material

Fifty-four fingers in 21 patients were operated on in the above manner (Figs. 4 and 5). All patients were women. Operative indications were tenosynovitis, catching, and decreased active range of motion.

Results

The follow-up period ranged to 84 months, with an average of 16 months. One patient was lost to follow-up. All patients were improved. One finger in each of two patients required a second procedure. In one a tenolysis was done because motion had not been started until the fourteenth day. In another patient a proliferative flexor tenosynovitis occurred in all of the fingers, duplicating the original symptoms. A repeat tenosynovectomy was carried out. After operation, motion was increased in all fingers and the tendons were found to glide freely to the extent of the passive motion of the joints. There were no subsequent ruptures of the flexor tendons. Seven patients required wrist flexor tenosynovectomy at the same operative procedure.

Discussion

The immediate problems of limitation of motion and locking were solved by this procedure. Except for one patient, in whom the tenosynovitis recurred, the effect of tenosynovectomy seems to have some lasting value.

We prefer to leave half of the superficialis to prevent development of “swan-neck” deformity which is caused or accelerated by lack of function of this tendon. If a patient has a mild flexion contracture of the proximal interphalangeal joint, the entire superficialis probably could be excised.
Fig. 3. Nodule in tendon over the middle phalanx causing locking and triggering out in the finger.

Fig. 4. Typical findings of flexor tenosynovitis.

Fig. 5. Intraoperative photograph illustrating pulleys left intact, section of superficialis tendon resected, and tenosynovectomy completed.
Whether or not ulnar drift of the fingers will be influenced by this procedure is impossible to prove because of the variable nature of the disease. All but two patients have had additional operations for rheumatoid deformities. Eleven of the 21 patients have had metacarpophalangeal arthroplasties or synovectomies either before or after the flexor tenosynovectomy. Although the relationship of ulnar drift in the rheumatoid hand to this procedure is theoretical, we believe it is relative.

REFERENCES
6. Riordan DC: Personal communication, 1960