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Surgical Treatment of Trigger-Finger By a Subcutaneous Method

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Trigger-finger is a condition characterized by inability to flex and extend the finger evenly. This is due to an interference in the mobilization mechanism of the finger. The unevenness of action may be likened to the motion of a spring, and is due to the presence of an enlargement in the tendon in front of the opening of the proximal annular ligament or osteofibrous canal of the finger.

When the affected finger is moved from flexion to extension, the enlargement is caught in the osteofibrous canal and, because of resistance, causes on release, pain and a springing effect. The nodule can be large enough to fix permanently the finger in flexion

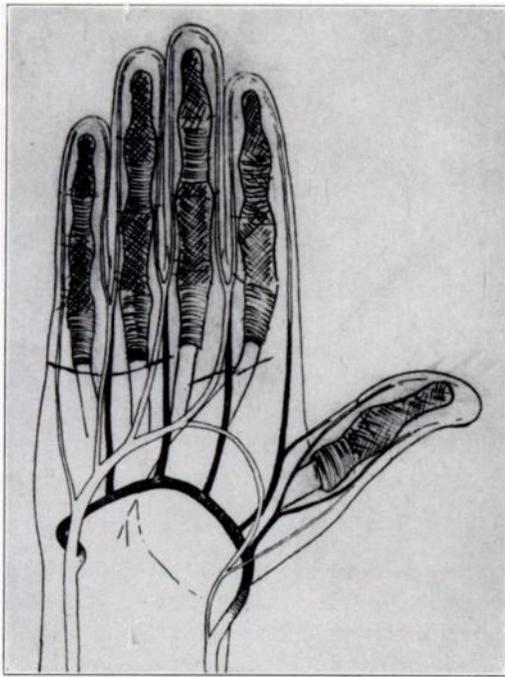


FIG. 1



FIG. 2

Fig. 1: Drawing showing the osteofibrous canals in the hand. The transverse fibers correspond to the pulleys. The nerves and arteries are on either side of the canals.

Fig. 2: Roentgenogram of the hand showing the palmar creases and the interdigital spaces. The origins of the fibrous canals of the fifth, fourth, and third digits are at the level of the distal palmar crease, while the origin of the fibrous canal of the second digit is at the level of the proximal palmar crease. This is more distal than examination of the skin indicates.

(camptodactylia). Although the origin of these lesions can be attributed to a single sizeable trauma or to repeated microtraumata, many cases are without any precise etiology.

On clinical examination, the enlargement of the tendon is found just under the metacarpophalangeal articulation. An interphalangeal swelling is, as yet, unknown. The enlargement is usually painful under pressure, and during movement of the finger, its motion can be felt under the skin. Often, the springing seems to take place at the level of the distal interphalangeal articulation, the most difficult to place in extension. When surgery is performed at this level, the real cause is found to be situated in a more proximal location.



FIG. 3



FIG. 4

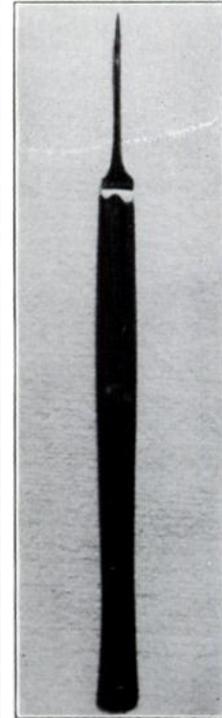


FIG. 5

Fig. 3: The opening of the osteofibrous canal of the thumb is at the level of the proximal palmar crease when the hand is held in the anatomical position.

Fig. 4: The relationship between the palmar creases and the ends of the osteofibrous canals is shown.

Anatomicopathologically, the presence of a small fibrinous nodule or cyst can be seen in the flexor tendon. The lesion appears more often in the thumb than in the fingers. Some of these nodules can disappear spontaneously and others respond well to physical therapy. Many require surgical intervention. A sesamoid bone under the tendon rarely is the cause of this condition.

Anatomy of the Osteofibrous Sheaths

Along the level of the digits, the flexor tendons lie within the synovial sheaths and osteofibrous canals which hold these tendons fixed against the palmar surface of the phalanges. This canal, or pulley, is composed of transverse and interwoven fibers spreading out from the distal insertion of the tendon in the phalanx, up to about two centimeters proximal to the metacarpophalangeal articulation. The so-called pulley is a reinforcement of the canal by transverse fibers at the level of the proximal and middle phalanges and these extend to the proximal end of the head of the corresponding metacarpal.

From the topographical point of view, the common volar digital vessels and nerves pass along both sides of the flexor tendons on the distal part of the palm and divide at the level of the metacarpal heads into the collateral nerves and arteries of the fingers. In this way, no vessels or nerves lie between the osteofibrous canal and the skin (Figs. 1 to 3).

Skin Markings

The metacarpophalangeal articulations are situated for the last three digits two centimeters distal to the proximal palmar crease and for the index finger and thumb one centimeter distal to the proximal palmar crease (Fig. 4). The proximal extremity of the osteofibrous canal ends about one centimeter proximal to the metacarpophalangeal articulation, and its origin is located at the level of the distal crease for the last three digits,

and at the level of the proximal crease for the thumb and index finger. The openings of the osteofibrous canals should, therefore, be at the crossing of the palmar creases with a mid-line running along the palmar surface of the fingers.

Method

The instrument used to correct trigger-finger is a fine tenotome with a blade one millimeter wide and one centimeter long; a fine sharp-pointed scalpel can also be used (Fig. 5).

The skin should be disinfected with cetavlon and iodine, and the area where the puncture is to be made should be infiltrated with about one cubic centimeter of 1 per cent novocain. The skin is then pierced with the tenotome, the point of which is directed toward the base of the opening of the osteofibrous canal. One should be able to feel the fibers of the tendon sliding under the blade. The blade is then passed under the edge of the canal. Then, working from below up, a cut a few millimeters in length should be made. At the same time, with the tenotome in place, the patient is asked to flex and extend the finger, and, if the jumping movement can still be felt, the incision in the canal should be made longer. This incision should be made exactly over the mid-line of the metacarpal and rigorously parallel to that line (Fig. 6). In this way, it is impossible to injure a nerve or collateral artery located beside the tendon. Even if the tenotome cuts deeper it is in no danger of cutting the tendon because the blade will stay parallel to it. It will not matter if the fibers of the tendon are slightly divided. After the operation, the tenotome is removed and the small laceration is covered with a dry dressing which can be removed after forty-eight hours. Neither suturing nor immobilization is necessary, and the patient can immediately resume work. Slight pain for the next few days over the site of the incision is not unusual.

Conclusion

This simple operation can be done without any special preparation in the office.

Fifty-two patients were treated by this method with good results. There were no inflammatory or functional complications. A few patients complained of pain over the area of the incision, but there were no complaints after three or four days.

I would like to insist upon the following few points. In no instance should the nodule be removed. The tendon is a very delicate structure which will not tolerate interference. The removing of the nodule provokes adhesions and sometimes causes rupture of the tendon. In almost any case, the simple incision of the osteofibrous canal is sufficient.

Many surgeons prefer the open method rather than the closed method; but, for this particular condition, I think that this method can be useful to surgeons who are well acquainted with the anatomy of the hand.

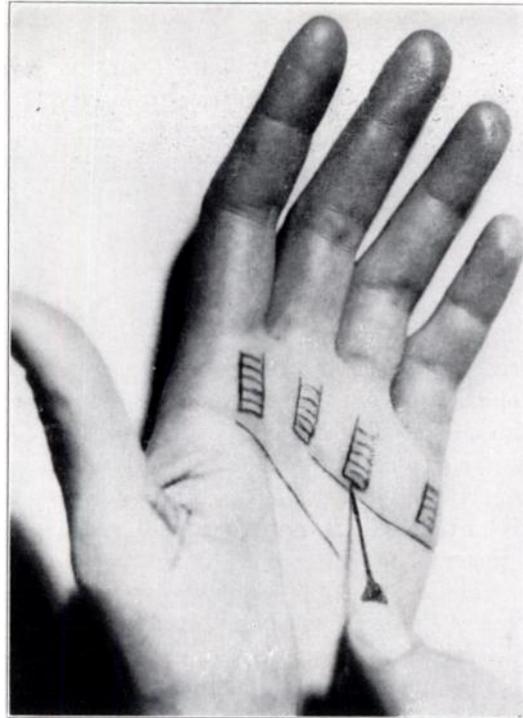


FIG. 6

Position of the tenotome for the incision of the skin and the opening of the canal.