

Extensor Pollicis Brevis Transfer to Flexor Digitorum Sublimis in Hansen's Disease—Follow-up Study for Four Years*

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- (1) Five cases of tuberculoid leprosy with paralysis of thumb are studied.
- (2) Extensor pollicis brevis was anastomosed with ring finger, flexor sublimis at different levels, and cases were assessed.
- (3) Case reports, assessments and advantages of the operation are presented.

Introduction

In the action of pinch, the thumb has to be brought forward in front of the hand and rotated to oppose the fingers. In this position the thumb is supported normally by the extensors, flexors, abductors, adductors and opponens. In leprosy, the short flexor of the thumb, the adductor, the abductor and the opponens are all likely to be paralysed. This leaves only the long and short extensors and the long flexor. The only remaining function of the paralysed thumb is the ability to squeeze against the side of the second metacarpal bone.

Opposition is not only a movement. It also gives the widest area of contact between the pulps of the thumb and finger. Three joints are responsible for movements of the thumb: interphalangeal, metacarpophalangeal and carpometacarpal. The range of mobility increases from distal to proximal.

Instability, a frequent result of combined median and ulnar palsy, must be corrected since it jeopardizes any restoration of function. The first carpometacarpal joint, by virtue of its architecture and the laxity of its capsule, makes opposition possible. Any damage to this joint will cause deterioration of this basic movement. An operation which aims at restoring opposition of the thumb will be successful only if the stability and mobility of these joints are preserved.

A number of procedures have been devised to produce opposition of the thumb. Starting from the principle of the pulley operation described by

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Bunnell, one may modify any of its 3 basic components which are:

- (1) the motor muscle;
- (2) the pulley;
- (3) the point of insertion.

It is preferable to choose a muscle the transfer of which will not produce any appreciable motor deficit.

The purpose of this paper is to describe a new method of reconstructive surgery for the paralysed thumb in Hansen's disease, without sacrificing the powerful flexor digitorum sublimis. For the follow-up study 5 cases with ulnar and low median palsy were chosen.

Technique

EXTENSOR POLLICIS BREVIS TRANSFER TO FLEXOR DIGITORUM SUBLIMIS TENDON

No tourniquet is applied. Locally 1% Lignocaine hydrochloride is given and an inverted "L"-shaped incision is made on the posterior aspect of the lower third of the forearm to expose the extensor pollicis brevis tendon. At the musculo-tendinous junction the tendon is divided.

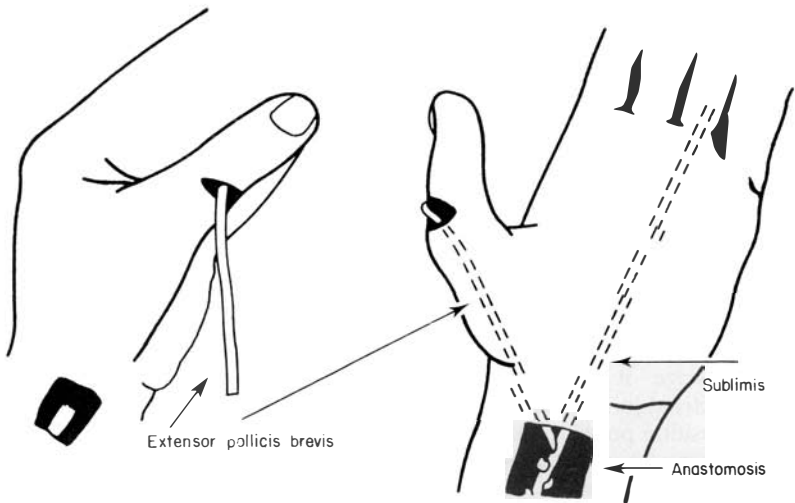


Fig. 1. Operative procedure.

Another transverse incision is made at the posterior aspect of the metacarpophalangeal joint of the thumb. The extensor pollicis brevis tendon is identified and pulled out through the incision.

An "S"-shaped incision is made on the distal third of the anterior aspect of the forearm and the tendon of the flexor digitorum sublimis of the ring finger is

identified. By asking the patient to flex the ring finger, the excursion of the sublimis tendon is noted. In all the cases the maximum excursion was at a point about 1 in proximal to the wrist joint. A subcutaneous tunnel is made between the forearm incision on the anterior aspect and the thumb incision to bring the extensor pollicis brevis tendon to the forearm.

Keeping the thumb fully rotated and abducted the extensor pollicis brevis tendon is anastomosed with the flexor digitorum sublimis tendon about 1 in proximal to the distal wrist crease.

Wounds are closed with continuous stainless steel wire and the hand plastered in the lumbrical position with thumb fully rotated and abducted.

Plaster and the sutures are removed after 3 weeks and exercises started.

Case Reports

CASE NO. 1

Male aged 41 years, an oil merchant, was a case of tuberculoid leprosy with right high ulnar and low median palsy.

On examination of his right thumb, the metacarpophalangeal joint was hypermobile, interphalangeal joint was flexed and voluntary extension was not possible. There was no opposition. He was operated upon in August 1970 and the plaster and sutures were removed after 20 days. Three months after operation action of the tendon was good, rotation and abduction was fair. Tip flexion was present and opposition was possible. Pinch was active, pulp to pulp, and stability was good. Strength was "4".

Four years later rotation was very good, abduction was good, tip flexion was present and opposition was possible. The web was fully stretched. The patient was not able to hold the handle of a bicycle before the operation and was happy that he could do so after the operation.

CASE NO. 2

Male aged 45 years, an agriculturist, was a case of tuberculoid leprosy with bilateral high ulnar and low median paralysis.

On examination of his right thumb the metacarpophalangeal joint was hypermobile. The interphalangeal joint had flexion contracture. Assisted extension was partial, opposition was nil. Pinch was of active adduction type. The web was slightly contracted and there was no rotation. He was operated upon in July 1970. After 5 months, tendon action was good. The metacarpophalangeal joint was stable. Full abduction was possible and opposition was good. Pinch was of nail to nail, as he had clawed fingers. Grip was fair.

After 1 year there was no hyperextension of the metacarpophalangeal joint. Abduction was full and the web was well stretched. Grip was good.

CASE NO. 3

Male aged 40 years, was a case of tuberculoid leprosy with bilateral high ulnar and low median paralysis.

On examination the metacarpophalangeal joint was hypermobile. Rotation, abduction and opposition were nil. Pinch was of adduction type. The web was adequate. He was operated upon in July 1970. Five months after the operation, the metacarpophalangeal joint was not stable. Adduction, flexion and rotation were nil. There was hyperextension of the metacarpophalangeal joint; the interphalangeal joint was flexed. Abduction and opposition were nil. Stability, strength and rotation were good.

In this case the anastomosis was done at 1 cm proximal to the distal wrist crease. The excursion of the sublimis is better at 2.5 cm proximal to the wrist crease and therefore the action was not good.

Before operation the patient used to injure the web near the metacarpophalangeal joint. He was able to use the crowbar and spade without injuring the web, after operation.

CASE NO. 4

Male aged 30 years, washerman by profession was a case of tuberculoid leprosy with bilateral ulnar and median paralysis.

On examination of his right hand, the metacarpophalangeal joint was hypermobile. The interphalangeal joint was flexed. Abduction and opposition were nil. Pinch was of adduction type. The web exhibited borderline contraction.

He was operated upon in March 1970. After 7 months of operation the metacarpophalangeal joint was hyperextended. The interphalangeal joint was flexed. Abduction was moderate and opposition was nil. Pinch, stability, strength and rotation were good.

He had not been able to wash clothes before the operation for about 17 years. After operation he was able to do so.

CASE NO. 5

Male aged 32 years, an agriculturist was a case of tuberculoid leprosy with bilateral ulnar and median paralysis.

On examination he had stiff claw on the left and absorbed fingers on the right hand.

The right hand metacarpophalangeal joint was stable. The interphalangeal joint was flexed. Assisted extension was limited. Abduction and opposition were fair. Pinch was active. Stability and strength were fair. Rotation was partial.

The patient was satisfied and is able to do his work better.

The tension of the extensor pollicis brevis to sublimis is not enough as the anastomosis was done 1 cm proximal to distal wrist crease as was done in one of the previous cases.

Advantages

- (1) Operation can be done under local anaesthesia without a tourniquet.
- (2) Action of the thumb can be seen by active flexion of ring finger.
- (3) Less trauma of the thumb.



Fig. 2. Pre-operative.



Fig. 3. Post-operative. Thumb-web stretched and with full rotation and abduction.

- (4) Easy to perform.
- (5) Powerful flexor sublimis need not be sacrificed.
- (6) Post-operative education is easier.
- (7) Post-operative web stretching is very good.

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