TRANSLOCATION OF THE FLEXOR POLLICIS LONGUS TENDON TO RESTORE OPPOSITION

MYER MAKIN, JERUSALEM, ISRAEL

From the Department of Orthopaedic Surgery, Hadassah University Hospital, Jerusalem

Many operations have been described to restore active opposition of the thumb, but all are dependent on the transplant of tendons and their rerouting to fulfil their new function. When there is no motor available for transplant—quite a common problem—the accepted procedure is to unite the first metacarpal bone to the second in the position of opposition.

In 1931 von Baeyer described a method of translocations of tendons whereby their origin and insertion were left intact but the tendon was rerouted to enable it to fulfil a different function. One of the operations he advocated was translocation of the flexor pollicis longus tendon to act as an opposer of the thumb. Von Baeyer recommended a circular incision around the thumb; after the tendon of the flexor pollicis longus muscle had been freed it was looped over the tip of the thumb and wound around the proximal phalanx to oppose the thumb. In many cases the circular incision around the thumb caused necrosis of the distal part of the thumb and the operation fell into disrepute.

My method embodies the principles of translocation of the flexor pollicis longus. It avoids the dangers of necrosis, is simple to perform and successful in restoring opposition.

Opponens translocation is indicated when active opposition is lacking and when all the intrinsic muscles of the thumb are paralysed. The thumb should be freely mobile and there must be no contracture. To ensure a satisfactory result the power of the flexor pollicis longus muscle should be at least "good" (rated 4).

TECHNIQUE OF OPERATION

A pneumatic tourniquet is applied. A Z-shaped incision is begun on the radial border of the thumb and extended from the interphalangeal crease to the proximal crease, thence crossing the palmar surface and along the ulnar margin of the thenar eminence (Fig. 1). The tendon of the flexor pollicis longus muscle is identified and freed downwards to its insertion at the base of the distal phalanx and upwards to the mid-portion of the thenar eminence. The tendon is lifted out of its sheath and freely mobilised. The proximal phalanx of the thumb is then exposed by subperiosteal dissection and an oblique osteotomy performed (Fig. 2). The flexor pollicis longus tendon is pulled through the osteotomy site (Fig. 3). Following translocation the tendon loops around the phalanx, lying between the extensor tendon and the bone and then over the dorsal surface of the metacarpo-phalangeal joint. A Kirschner wire is drilled from the osteotomy site out through the tip of the thumb and then reinserted in a retrograde manner into the proximal fragment. The Kirschner wire crosses the interphalangeal joint of the thumb and fixes the proximal phalanx in an anatomical position. At the end of the operation the tendon winds around the proximal phalanx and first metacarpo-phalangeal joint of the thumb; the tendon is in continuity and its origin and insertion remain intact. The subcutaneous tissues and skin are closed with interrupted sutures. The thumb is supported with a pressure dressing. Three weeks after operation the dressing is removed and the Kirschner wire extracted.
DISCUSSION AND SUMMARY

The method here reported was developed because of dissatisfaction with treating loss of opposition in cases where no motor tendon was available for transplant. The accepted procedure of uniting the first to the second metacarpal by a bone graft, even when successful, cannot restore active opposition and leaves a rigid first metacarpal bone. In the growing child the fixed first metacarpal causes the secondary ugly deformity of pollex valgus.

My method avoids the need for tendon transplant and is technically easy to perform. The origin and insertion of the translocated tendon remain intact. There is no need to construct a pulley. There is no loss of power. The operation has now been undertaken in fourteen cases, all of whom have regained strong active opposition (Figs. 4 and 5).

During the development of the operation the only complication that arose was due to the translocated tendon slipping into the osteotomy site, separating the bony fragments and causing non-union of the phalanx. This occurred in four of the first eight cases operated upon and was due to a transverse osteotomy of the proximal phalanx. Since this complication was
recognised oblique osteotomy of the phalanx has been performed instead. This effectively prevents the tendon from slipping into the osteotomy site.

The disadvantage of the method is that it causes loss of active flexion of the interphalangeal joint of the thumb as the tendon becomes fixed to the proximal phalanx. This does not appear to entail much disability as most of the fine movements of opposition are made with the interphalangeal joint extended. The interphalangeal joint is stable and in neutral position.

According to Riordan (1959), three mechanical principles need to be fulfilled in order to restore effective opposition. 1) The pulley should remain constant in position and distal to the point where the palmaris longus passes the flexion crease of the wrist. In this method the point where the flexor pollicis longus deviates from its normal course becomes a fixed and
natural pulley in the correct site. 2) The tendon transplant must pass subcutaneously across the thenar eminence superficial to the volar carpal ligament and should be maintained over the centre of the tendon of the abductor pollicis brevis muscle at the level of the metacarpo-phalangeal joint. In the method described this principle is observed. 3) The transplant needs to continue distally into the tendon of the extensor pollicis longus muscle in the direction of the fibres of the abductor pollicis brevis and to end in the long extensor just proximal to the interphalangeal joint. This describes exactly the situation of the translocated flexor pollicis.

Riordan's three principles are followed and active opposition may be restored without the need for tendon suture and without the need to construct a pulley. There is no loss of power so that the regained opposition is strong.

Results have been so satisfactory that the method described is now advocated as the method of choice even where other tendons are available for transplant.

REFERENCES
