SURGERY OF THE RHEUMATOID THUMB


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In order to maintain the functional independence of the rheumatoid patient, thumbs capable of pinch grip are essential. The surgical problems posed at the various stages of the disease are therefore more acute than those of other digits and some are unique to the thumb. This review is based on the series of 216 operations on rheumatoid thumbs shown in the Table.

### TABLE

A series of 216 Operations performed on Rheumatoid Thumbs

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#### SYNOVECTOMY

The indications for and the results of synovectomy of the thumb joints are the same as those for other finger joints. If good results are to be obtained, operation should be undertaken early before erosive changes or gross loss of movement have occurred (Harrison, 1967; Ansell et al., 1970).

Synovectomy probably has a limited effect on the progress of the disease but in the majority of cases it has relieved pain, often dramatically, and has removed the swelling together with its deforming effect on anatomical structures in and around the joint.

#### EXTENSOR TENDON REPAIRS

The commonest tendon to rupture as a result of rheumatoid arthritis is the extensor pollicis longus. Repair is not possible by direct approximation and the simplest transplant is the extensor pollicis brevis using the button-hole technique (Fig. 1).

When the first 40 cases were followed up (Harrison et al., 1972), 39 had a satisfactory correction. One patient had ruptured 7 months after the original repair, and was re-repaired with a good result.

#### FLEXOR TENDON REPAIR

The flexor pollicis longus (f.p.l.) is the commonest flexor tendon to rupture either at the level of the metacarpophalangeal (M.P.) joint or at the insertion.

In 4 cases the rupture occurred at the level of the M.P. joint. It has been our experience that flexor tendon corrections do not do so well in rheumatoid cases as in traumatic, and for rupture at this level the sublimis transplant is the method of choice.
All patients recovered a functional range of movement which in the thumb can be half normal or even less.

In 5 cases the f.p.l. was avulsed from its insertion. This was usually associated with a Z-deformity in which the M.P. joint was flexed and there was progressive hyper-extension of the terminal joint which can cause instability and ultimately a flail joint (Fig. 2).

In such cases the M.P. joint should be fused with a straight intramedullary peg (see below) and the tendon repaired by a tendon graft, the distal suture of which is tied over a button on the terminal pulp. More recently the graft has been passed subcutaneously as the normal route is lined with rheumatoid granulation tissue. In most cases only a small range of movement was achieved but there was a vast improvement in function from the stability provided by the graft and the correction of the associated deformities (Fig. 3). An alternative is to fuse the terminal joint with a peg.

Z-deformity: Extensor Loop Operation

A Z-deformity, as noted above, consists of progressive subluxation of the M.P. joint associated with hypertension of the terminal joint, giving an appearance similar to a Boutonnière deformity of a finger.

In order to prevent or retard the progression to full subluxation, and provided there is no gross erosive change with instability, the extensor loop procedure (Harrison, 1971)
is used. Half the split extensor pollicis longus is passed through a drill-hole in the base of the phalanx and sutured to itself. A synovectomy is done at the same time and any erosions curetted. There have been 35 cases treated by this procedure in 14 of which a repair of the extensor pollicis longus was also carried out. Initially the only complication was loss of terminal joint movement, but this was avoided in later cases by starting immediate active movements of this joint. Deformity has not always been corrected but no case has progressed sufficiently to warrant arthrodesis. This may be due to loss of movement which retards the progress of the disease from disuse.

It is not expected that the procedure itself will have an influence on the progress of the disease although accompanied by synovectomy, but it has improved stability and reduced pain. As a result, all have improved in function.

To correct the flexion deformity of the M.P. joint, Nalebuff (1968) has recommended rerouting the extensor pollicis longus into the base of the proximal phalanx after division distally. He inserts the tendon into a cuff of capsular tissue attached to the dorsal aspect of the proximal phalanx.

**Arthrodesis of the M.P. Joint**

Arthrodesis is performed for gross destructive change and instability (Fig. 4) or in association with flexor and extensor repairs as described. Initially arthrodesis was done by bone graft and wire, but 16.6 per cent failed to unite (Fig. 5) and the prolonged immobilisation caused adjacent joints to become stiff. Several thumbs were shortened as a result and this altered the functional relationship between the thumb and index finger with resulting disability.

Clayton (1962) stated that arthrodesis may be very difficult in a patient whose disease is of the chronic, slowly progressing type. He recommended fusion of the M.P. joint and used a two-pronged prosthesis. A simpler method presented itself with the introduction of the intramedullary peg (Harrison and Nicolle, 1974, see page 240). It

![Fig. 3. A and B, Range of movement in the terminal joint following a flexor tendon graft and fusion of the M.P. joint with an intramedullary peg.](image-url)
maintains length, provides stability, requires no immobilisation and is quickly inserted.

In this series the straight peg has been used for the M.P. joint on 20 occasions without complications.

Fig. 4. A and B, Examples of instability and subluxation suitable for fusion of the M.P. joint with a straight peg.

**Arthrodesis of the Terminal Joint**

The terminal joint of the thumb is particularly liable to become unstable from progressive Z-deformity, avulsion of the f.p.l. and destructive changes within the joint. An unstable terminal joint is a serious functional disability and should be corrected early before joint destruction makes any form of fusion impossible.

Three cases treated by bone graft failed to unite. Seven cases treated by intramedullary pegs with 20° angles have remained stable and there have been no complications.

**Bone Struts for Adduction Deformities**

Such deformities may be primary, secondary or paralytic.

Primary deformities are due to rheumatoid involvement and destructive change in the carpus and first carpometacarpal joint, often presenting as a dorsal subluxation of the carpometacarpal joint and a compensatory hyperextension of the M.P. joint.

Secondary deformities occur when the thumb pursues the retreating index finger in ulnar drift, in which case opposition becomes changed to apposition, and the index
Fig. 5. Attempted arthrodesis of the M.P. joint by bone graft and wire which failed to unite.

Fig. 6. A, Severe adduction deformity. B, The correction after an intermetacarpal bone graft.

Pronates instead of supinates, or the middle finger is brought up to support the index. Paralytic deformities are caused by paralysis of the abductor pollicis brevis and opponens pollicis and may complicate the carpal tunnel syndrome.

The effect of adduction deformity on function is to limit circumduction so that the thumb does not oppose the fingers. Fine pinch, power pinch and Tripod pinch become limited.

Progressive adduction deformity also puts a strain on the ulnar collateral ligament of the first metacarpophalangeal joint and this may rupture.

In order to correct this deformity the “by-pass” procedure has been used; in this a bone graft obtained from the olecranon is used as a strut wedged between the first and second metacarpals. Because some of these grafts were expected to be absorbed during the first year, with some recovery of movement and regression of deformity, a thin silastic sheet was placed between the scaphoid and trapezium, or in the carpometacarpal joint in order to avoid fusion.

Seventy per cent of the bone grafts survived and although proximal movement is
limited, function remains satisfactory and there has been no indication to divide the bone graft to restore movement (Fig. 6). Pain has been relieved in all cases.

Flatt recommends in these cases removing the trapezium and part of the base of the metacarpal. He also recommends stripping the muscular attachments from the first metacarpal; he considers that these structures are contracted and should be released. Kessler (1973) resects the base of the metacarpal and inserts a silicone spacer. Entin (1971) recommended a similar procedure. Our practice has always been directed towards avoiding interfering with the trapezium as this is the foundation stone of the thumb and its removal must shorten the overall length of the thumb and produce a flail joint.

**SUMMARY**

Ten procedures have been described in 216 operations. Many are interdependent. Some procedures are more effective than others but they are all designed to maintain function and reduce the incidence of progressive disability.

*We would like to acknowledge with thanks the help we have received from Dr Peter Moller, Dr J. Edmonds, Dr Bob Clement and Mr Norman Olbourne, F.R.C.S., in reviewing these cases.*

**REFERENCES**


