

EXPERIENCE IN WRIST JOINT ARTHRODESIS

A Follow-up Investigation into 16 Operated Cases.

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INTRODUCTION

The most common indications for wrist joint arthrodesis are post-traumatic—arthritic—and also neurological injuries. The arthrodesis may be performed in various ways, the radiocarpal approach alone and also in combination with intercarpal and carpometacarpal arthrodesis. Various methods are described in the literature.

Radiocarpal arthrodesis: Smith Petersen's method with ulnar transplant + bone chips, Seddon's method (a somewhat modified Smith Petersen).

Radiocarpal + intercarpal arthrodesis: Abbott's method using an ileum graft + bone chips. Liebolt's method only utilises bone chips from the ileum. Brockman-Nissen's method introduces tapered radius into both rows of carpal bones.

Radiocarpal + intercarpal + carpometacarpal arthrodesis: Colonna and Wickstroem introduce rib bone transplant into the radius, carpus and metacarpals II and III. Brittain's method utilises tibial transplant in the radius, carpus and metacarpal III.

In all methods excepting those of Brittain and Brockman-Nissen cartilage resection takes place. With the methods of Smith Petersen and Seddon primary resection of the distal ulna takes place.

In the Orthopaedic Clinic in Härnösand 17 patients underwent wrist joint arthrodeses. The series was followed-up. One patient had died during the intervening period and one patient had moved and could not be contacted. Thus 15 patients were followed-up, 10 men and 5 women. One woman was operated on bilaterally. The series thus comprises 16 wrist joint operations. Nine patients, all right-handed, underwent operation on the left side. The indications for operation can be seen in Table 1.



Fig. 1.
Malacia of the semilunar bone.
a. Before operation.
b. After operation.



Fig. 2.
Rheumatoid arthritis.
a. Before operation.
b. After operation.

Operative technique: 13 wrist joints were operated on and tibia grafts were inserted in a chiselled groove in the radius, the carpus and also metacarpal III. Cartilage resection was performed in these cases radiocarpally but not intercarpally or carpometacarpally. The method is therefore a modified Brittain. (Figs. 1 and 2). In 3 cases Abbott's method was employed. (Fig. 3). The distal ulna was resected in 5 wrists.

The operation was performed in a closed field. Narcosis was used in



Fig. 3.
Fracture of the navicular, earlier operated on.
a. Before arthrodesis.
b. After arthrodesis.

4 of the operations and plexus anesthesia in 12. In the later cases tibial grafts were taken under local anesthesia. In conjunction with the operation a circular plaster was applied, cut primarily and stretching from the elbow to the interphalangeal joint of the thumb, indeed to the metacarpophalangeal joints of the fingers. Re-plastering and removal of sutures took place after 2 weeks. The average period of fixation lasted 17 weeks.

Postoperative complications were observed. In one case wound infection occurred, the transplant sequestered and had to be removed 3½ months after operation. A tibia fracture at the site of the graft was observed in one case 2½ months after the operation in conjunction with trauma. Graft fractures were observed in 3 cases (in one case carpo-metacarpally and in 2 cases in the middle of the transplant). Otherwise no postoperative complications were observed.

Follow-up investigation:

12 of the patients stated that they were pleased with the results, 3 were dissatisfied. 4 of the 12 satisfied patients declared that they had slight aching after heavy work, the other 8 (1 operated bilaterally) were completely free from trouble even with heavy work. The 3 dissatisfied patients stated that they were subject to aching with light work.

Working capacity.

11 patients had returned to their old work. Two patients had been trained in lighter occupations. Two patients were incapable of working.

Objective investigation:

Clinically, arthrodesis was present in 12 cases. Adjusting movements occurred in 3 patients, all with graft fracture. Two of these did not consider this slight instability to be troublesome. Total instability existed in 1 patient who had incurred infection postoperatively.

The position of the wrist was on average at 15° dorsal flexion. Three patients had 15° of radial deviation, one patient had 15° of ulnar deviation and the remaining wrists were in a mid-position. Pro- and supination movements were normal apart from 3 patients (4 wrists). In 3 of these cases the distal ulnar fragment was not resected.

Finger mobility was normal in all cases except 3. These latter had neurological disturbances or rheumatic changes pre-operatively so that it is difficult to decide if the operation was the cause of the limited mobility.

The opponens function was normal in all cases except 1 (a patient with spastic hemiplegia). A reduction in sensibility on the dorsal side of the wrist within an area about 5 cms. wide around the operation scar was present in 5 cases. Otherwise no neurological disturbances caused by the operation could be observed. Shoulder and elbow mobility had not been affected in any case by the post-operative regimen. See Table II for dynamometer values.

DISCUSSION

There has been much discussion whether a stiff wrist joint is justified. In our series pain and deformity were so severe that we considered that the indications existed. After the operation the strength of the hand was not significantly reduced and the pro- and supination mobility remained by and large unchanged and in the majority of cases normal. The cosmetic result was also good.

Brittain's method was somewhat modified. Thus the cartilage resection was carried out radiocarpally and in the middle of the graft a notch was sawn out. This proved later to be unsuitable owing to the risk of graft fracture. A small lip can be sawn out of the graft instead in order to aid its insertion.

If there is a reduction in pro-and supination mobility, or if the ulna is too long in the radiocarpal joint after resection, the distal fragment of the ulna must be resected.

SUMMARY

17 patients with the diagnosis rheumatoid arthritis, post-traumatic arthrosis and paresis were operated on. 15 patients with 16 operated wrist joints were followed-up. 12 patients were pleased and 3 displeased. In 12 wrist joints osseous ankylosis and a good functional condition were achieved.

RESUME

17 malades pour lesquels avaient été posés les diagnostics-arthrite rhumatoïde, arthrose post-traumatique et parésie, ont été opérés. 15 malades avec 16 articulations du poignet opérées ont été suivis. 12 malades étaient satisfaits et 3 mécontents. Dans 12 poignets une ankylose osseuse et une bonne condition fonctionnelle avaient été obtenues.

ZUSAMMENFASSUNG

17 Patienten mit reumatischer Arthritis, post-traumatischer Arthrosis und Paresen wurden operiert. 15 Patienten mit operierten Handgelenken wurden nachuntersucht. 12 Patienten waren zufrieden, 3 nicht beschwerdefrei. Bei 12 Handgelenken wurden knöcherne Ankylose und eine gute Funktion erreicht.

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