

SYNOVECTOMY OF THE ELBOW IN RHEUMATOID ARTHRITIS

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In the past little attention has been paid to synovectomy of the elbow in rheumatoid disease, despite the reports of Wilkinson and Lowry (1965) and of Laine and Vainio (1969). The recent papers of Torgerson and Leach (1970) and of Inglis, Ranawat and Straub (1971) encouraged us to review our experience again (Wilson 1971). Like others, we recommend synovectomy of the elbow even in the late stages of rheumatoid arthritis.

TABLE I
SIDE AFFECTED

Side	Number of elbows
Right . . .	23
Left . . .	14
Both . . .	9
Total . . .	55

TABLE II
TYPE OF DISEASE: SEROLOGY

Type	Number of patients	Sero-positive at some stage in disease
Adult rheumatoid arthritis . . .	34	23
Juvenile rheumatoid arthritis . . .	7	6
Still's disease . . .	4	0
Psoriatic arthropathy . . .	1	0
Total . . .	46	29 (63 per cent)

MATERIAL

The operation was performed on fifty-seven elbows in forty-eight patients over five consecutive years. Fifty-five elbows from forty-six patients remained for review after two recent operations were excluded. There were thirty-five women and eleven men. Other details concerning the patients are set out in Tables I and II and in Figures 1 to 4. Radiologically none of the joints was normal before operation and most showed advanced destruction (Fig. 5).

INDICATIONS FOR OPERATION

In all joints except one, pain was the main reason for operation. In twenty-two elbows (39 per cent) it was the sole reason. Other indications were persistent swelling (twenty-two elbows), progressive loss of movement (four elbows), or both (nine elbows).

TECHNIQUE OF OPERATION

The operations were performed by twelve surgeons, but the technique was similar in all cases except five, in which only the lateral side of the joint was opened. Both medial and lateral incisions were made. The capsule and collateral ligaments were split longitudinally and detached from the supracondylar ridges of the humerus in continuity with the periosteum. This permitted wide access to all aspects of the joint, including the posterior recesses alongside the olecranon process. The head of the radius was excised if found to be damaged (twenty-eight elbows). The ulnar nerve was isolated during the medial dissection and transposed anteriorly in some cases.

Plaster was seldom used after operation and movement was encouraged when comfort allowed.

Complications were limited to one case of superficial infection and one of delayed healing. Both these ultimately gave a good result.

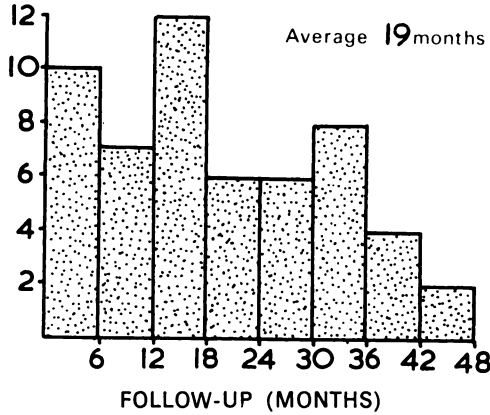


FIG. 1

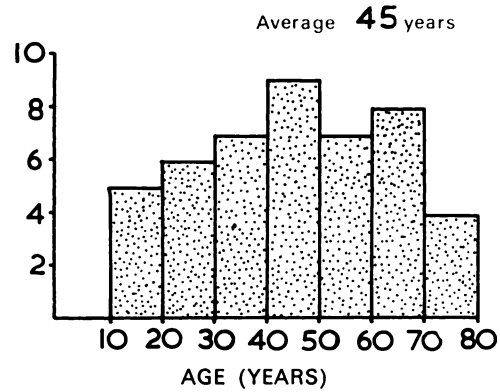


FIG. 2

Figure 1—Duration of follow-up (fifty-five elbows). Figure 2—Age (forty-six patients).

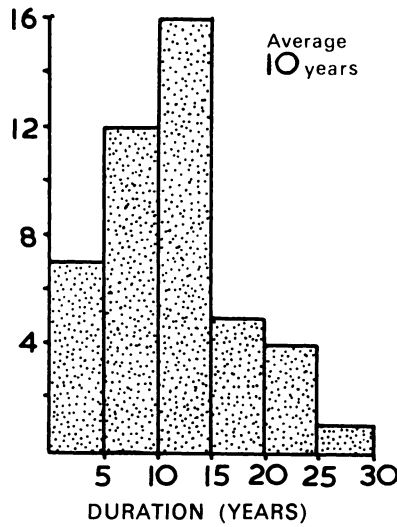


FIG. 3

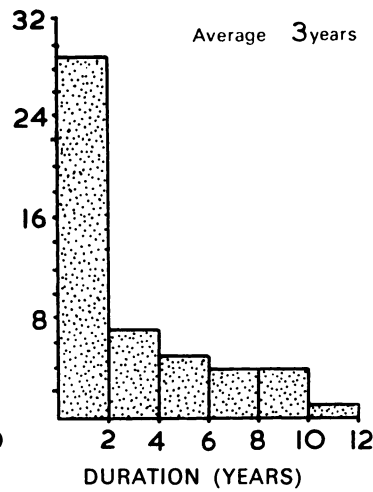


FIG. 4

Figure 3—Duration of disease (forty-five patients). Figure 4—Duration of elbow symptoms (fifty elbows).

RESULTS

Results were assessed by the severity of any residual pain, by the changes in joint movement and by the presence of synovial swelling or effusion.

Pain—Relief of pain was good. Most elbows caused no more than slight pain which did not interfere with use of the limb, and over half were painless. Only two elbows gave severe disabling pain (Table III). There was no correlation between relief of pain and a wide variety of clinical factors, including age, sex, duration of disease, duration of elbow symptoms, pre-operative radiological appearance, operation actually performed and length of follow-up. The duration of follow-up was often short (Fig. 1), but thirty-five elbows were reviewed on two occasions. In twenty-nine (83 per cent) the assessment of pain was the same or improved. This suggests that the early results will be maintained.

Mobility—Most joints either maintained or improved their pre-operative range of flexion-extension (hinge) movements (Table IV). There was a highly significant inverse relationship ($P < 0.001$; $r = -0.62$) between the alteration in the range of motion due to the operation and the pre-operative range itself. This was probably related to relief of pain. For pronation-supination (rotation) movements reliable details were incomplete, but nineteen of twenty-one joints maintained or improved their range (Table V). There was no markedly greater improvement in rotation in cases having excision of the radial head. Changes in both hinge and rotation movements were analysed in relation to a variety of clinical factors, including age, sex, duration of disease, duration of elbow symptoms, pre-operative radiological appearance,

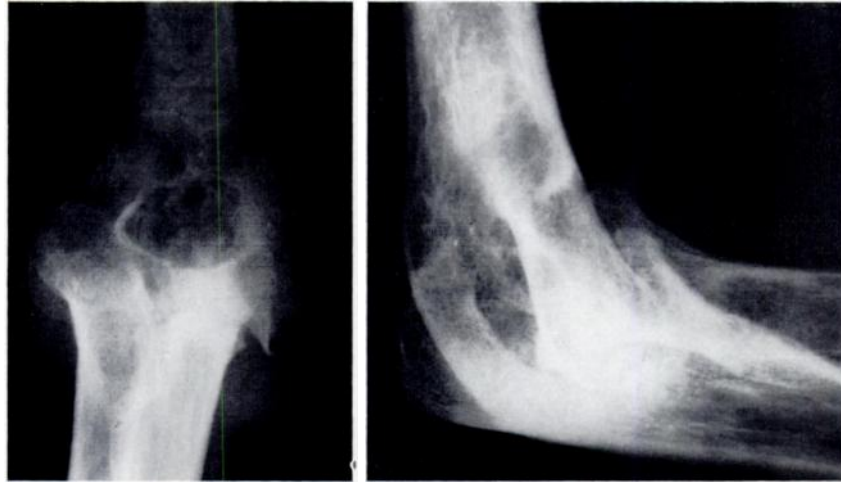


FIG. 5

Antero-posterior and lateral radiographs of the elbow of a woman of 34, with a ten-year history of rheumatoid arthritis, who would admit to only two years of elbow symptoms. Note the gross destructive changes. After operation she had no pain and 110 degrees of movement.

operation performed and length of follow-up, and also with pain relief itself. Change in rotation movement was compared with the operation actually performed and with the changes in hinge motion. No other correlations were found. The series contained eleven cases (fourteen elbows) of Still's disease and juvenile rheumatoid arthritis. Still's disease was defined as a polyarthritis, affecting more than four joints, for three months or with characteristic biopsy, in the absence of other well defined diseases (Ansell and Bywaters 1959). Juvenile rheumatoid arthritis was defined as a disease commencing before the age of sixteen years, sero-positive on three consecutive occasions with one other feature—nodules, vasculitis or characteristic erosions of hands or feet. The results in these cases were comparable with those in the series as a whole (Table VI). There were twelve elbows (22 per cent) in eleven patients in which the clinical result was for some reason unsatisfactory (Table VII). However, only half of these patients were dissatisfied.

Residual swelling—Of five joints (9 per cent) with residual swelling, three had had partial synovectomy through a lateral approach alone.

Ulnar nerve—Eight primary and one secondary anterior transpositions of the nerve were done. Four patients had neurological symptoms before operation. All had the nerve transposed, but none was completely relieved (Table VIII). Three patients developed symptoms for the first time after operation. Of these one had had a routine transposition. It seems that, unless there are nerve symptoms before operation, transposition of the nerve is not necessary. In only two cases (4 per cent) where this procedure was omitted did symptoms develop after operation. This is contrary to earlier findings (Wilson 1971).

DISCUSSION

Nearly all elbows showed severe radiological changes suggesting involvement for a long time (Fig. 5). Most patients had had the disease for many years—only seven (15 per cent) for less than five years (Fig. 3). However, few patients would admit to prolonged elbow

TABLE III
PAIN AFTER OPERATION

Pain	All joints	Synovectomy alone	Synovectomy with excision of head of radius
None	32 (58 per cent)	16	16
Slight	19 (35 per cent)	10	9
Moderate	2	0	2
Severe	2	1	1
Total	55 elbows	27	28

TABLE IV
HINGE MOVEMENT AFTER OPERATION

Change in range of movement	All joints	Synovectomy alone	Synovectomy with excision of head of radius
Gain	29 (55 per cent)	14	15
Same within ± 10 degrees	17 (32 per cent)	6	11
Loss	7	5	2
Total	53 elbows*	25	28

Six elbows (11 per cent) lost from the flexion extreme of their range, but in only two joints did this loss reach 30 degrees.
Six joints (11 per cent) lost from the extension extreme, with two losing 25 degrees and 30 degrees respectively.
* In two elbows values for movement before operation were not available.

TABLE V
ROTATION MOVEMENTS AFTER OPERATION

Change in range of movement	All joints	Synovectomy alone	Synovectomy with excision of head of radius
Gain	11 (52 per cent)	5	6
Same within ± 10 degrees	8 (38 per cent)	4	4
Loss	2	2	0
Total	21 elbows	11	10

symptoms. Twenty-nine (53 per cent) claimed trouble for under two years (Fig. 4), and only seven elbows (15 per cent) were mentioned among joints involved near the onset of the disease. This suggests that these patients are ignoring their elbows because of involvement of more immediately important joints such as those of the hands or lower limbs.

TABLE VI
RESULTS IN STILL'S DISEASE AND JUVENILE RHEUMATOID ARTHRITIS

Pain		Hinge movements	
None 12 (86 per cent)	} 14 (100 per cent)	Gain 5 (38 per cent)	} 11 (84 per cent)
Slight 2 (14 per cent)		Same \pm 10 degrees 6 (46 per cent)	
Moderate 0		Loss 2 (16 per cent)	
Severe 0			
14 elbows		13 elbows*	
* Movements before operation were not known in one patient.			

TABLE VII
UNSATISFACTORY JOINTS (TWELVE ELBOWS)

	Elbows	Percentage of whole group
Residual swelling	5	9
Excessive post-operative stiffness†	4	7
Post-operative pain	4	7
Instability	1	2
Total	14*	
* One elbow showed both residual swelling and moderate pain and another moderate pain and instability, both are included twice.		
† A range of 60 degrees or under after operation. However, all four of these joints were stiff before operation, with ranges of between 40 and 80 degrees.		

TABLE VIII
ULNAR NERVE

	Nerve transposed at primary operation			Nerve not transposed primarily	Totals
	Total	Full relief	Not full relief		
Symptoms before operation	4	0	4	0	4
First symptoms after operation	1	0	1	2*	3
No symptoms at any stage	3			45	48
Totals	8			47	55
* One transposition done as a secondary operation with relief, and one showing spontaneous recovery.					

This series is unusual in including a high proportion (25 per cent) of cases of either Still's disease or juvenile rheumatoid arthritis (Table II). The clinical results in these cases were the same as those of the whole series. Radiologically, these young patients often show epiphysial overgrowth, especially of the radial head. It is uncertain if this change will be arrested after synovectomy.

The two incisions give excellent access to the joint. Division of the olecranon (Inglis and colleagues 1971) with its increased trauma and risk of non-union is unnecessary. We cannot recommend the single lateral incision (Torgerson and Leach 1970), which carries a high incidence of recurrent swelling.

Improvement in range of movement is due mainly to relief of pain. Elbows that are stiff for mechanical reasons before operation gain little improvement in range (Table VII).

The results of synovectomy in rheumatoid arthritis have been good enough to make many elbow arthroplasties unnecessary. These more extensive procedures are reserved for cases of failure of response to late synovectomy.

Arthrographs were performed on some elbows, but proved of no help in management (Wilson 1971).

SUMMARY

1. Synovectomy of the elbow affected by rheumatoid arthritis is a worthwhile procedure even in the presence of advanced radiological changes.
2. Relief of pain is good (93 per cent) and movement is retained (87 per cent).
3. Although the follow-up in this series was short, averaging nineteen months, the results seem to be maintained.
4. Good access to the joint may be had through medial and lateral incisions, and division of the olecranon is unnecessary. A lateral incision alone is not recommended.
5. The ulnar nerve should be preserved during dissection. Anterior transposition is needed only if there are neurological symptoms before operation.

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REFERENCES

- ANSELL, B. M., and BYWATERS, E. G. L. (1959): Prognosis in Still's Disease. *Bulletin on Rheumatic Diseases*, **9**, 189.
- INGLIS, A. E., RANAWAT, C. S., and STRAUB, L. R. (1971): Synovectomy and Débridement of the Elbow in Rheumatoid Arthritis. *Journal of Bone and Joint Surgery*, **53-A**, 652.
- LAINE, V., and VAINIO, K. (1969): Synovectomy of the Elbow. In *Early Synovectomy in Rheumatoid Arthritis*. Edited by W. Hijams, W. D. Paul, and H. Herschel. The Hague: Excerpta Medica Foundation, p. 117.
- TOGERSON, W. R., and LEACH, R. E. (1970): Synovectomy of the Elbow in Rheumatoid Arthritis. *Journal of Bone and Joint Surgery*, **52-A**, 371.
- WILKINSON, M. C., and LOWRY, J. H. (1965): Synovectomy for Rheumatoid Arthritis. *Journal of Bone and Joint Surgery*, **47-B**, 482.
- WILSON, D. W. (1971): Synovectomy of the Elbow for Rheumatoid Arthritis. *Proceedings of the Royal Society of Medicine*, **64**, 264.