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Radical synovectomy with muscle release for the rheumatoid elbow

Twenty-three synovectomies of the elbow with concomitant muscle release at the humeral epicondyles were performed in 21 patients with rheumatoid arthritis. Ten elbows were classified as anatomical Stage 2, 12 as Stage 3, and one as Stage 4. The patients were followed from 1 to 8 years. Postoperative clinical results showed improved relief of pain, and range of motion, and activities of daily living. Increased range of motion with improvement of flexion contracture was obtained in most cases by releasing the muscle insertions around the humeral epicondyles and by resecting the radial head and bony spurs of the coronoid and the olecranon. The operation was beneficial even at advanced stages.

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It has been reported that synovectomy is useful in treating rheumatoid elbows, even late in the disease (Torgerson & Leach 1970, Taylor et al. 1976, Copeland & Taylor 1979, Eichenblat et al. 1982). However, the functional outcome does not always correlate with relief of pain (Inglis et al. 1971, Brumfield et al. 1985).

We have performed synovectomy with simultaneous muscle insertion release for rheumatoid elbows in order to improve the range of motion.

Patients and methods

From 1970 to 1984, 23 elbows in 21 patients (two males and 19 females) with classical rheumatoid arthritis were treated. According to the American Rheumatism Association criteria, ten elbows were classified as anatomical Stage 2, 12 as Stage 3, and one as Stage 4; 18 patients were in functional Class 2, and five in Class 3. The mean age of the patients at operation was 49 (30–70) years. The mean duration of the disease before surgery was 11 (4–30) years. The mean follow-up period was 4 (1–8) years. Two patients were operated bilaterally.

The indication for operative treatment was pain that did not respond to conservative measures and progressive loss of motion causing serious disability.

The skin incision was made in the posterolateral area of the elbow, which resembles Wadsworth's (1982) approach. The dissection was carried out between the brachioradialis and the triceps, and the extensor carpi ulnalis and the anconeus. The muscles attached to the humeral lateral epicondyle were released subperiosteally at their insertions. After resection of the radial head, total capsulosynovectomy was performed. The osteophytes of the olecranon and the coronoid process were resected until full extension and flexion were achieved. The periosteum and the fascia were left open without any sutures, and only the subscutaneous tissue and skin were closed. Suction drainage was inserted into the joint for 24 h. No external fixation was applied postoperatively. Active exercises of the elbow were started the day after the operation.

Postoperative clinical results were evaluated in respect of pain, range of flexion-extension, flexion contracture and activities of daily living. The method of evaluation employed a 100 point rating scale. Of these 100 points, 40 points were allotted for absence of pain, 30 to flexion-extension of 120 degrees, 10 to full extension and 20 to satisfactory ADL.

Results

The average preoperative pain score was 14 (5–25) points, while postoperatively it had increased to 34 (10–40) points; 17 elbows scored more than 35 points, i.e. almost complete relief of pain. However, two patients had slight pain and another three had moderate pain, but they were improved. One patient had unchanged pain.

The range of motion improved in 21 elbows and deteriorated in two; the loss of motion did not exceed 15 degrees. The average range of motion was 67 degrees pre- and 102 degrees postoperatively.

Table 1. Results of synovectomy with muscle release in rheumatoid elbows

Case	Sex	Age	Preop. (degrees)			Postop. (degrees)		
			Arc of motion	Maximal flexion	Flexion contracture	Arc of motion	Maximal flexion	Flexion contracture
1 R	F	52	45	130	85	80	145	65
2 R	F	60	55	145	90	60	90	30
3 R	F	40	25	70	45	65	90	25
4 R	F	30	90	150	60	75	115	40
5 L	F	43	90	130	40	100	130	30
6 L	M	70	100	120	20	90	115	25
7 R	F	64	0	45	45	98	120	22
8 L	F	55	80	120	40	129	145	16
9 L	F	47	50	90	40	100	110	10
10 L	F	32	32	90	58	80	120	40
11 L	F	40	90	120	30	124	150	26
12 R	M	54	105	120	15	132	132	0
12 L	M	55	90	110	20	115	125	10
13 R	F	38	50	90	40	70	85	15
14 R	F	45	10	100	90	100	120	20
15 R	F	42	75	115	40	94	118	24
16 L	F	49	40	115	75	104	124	20
17 L	F	43	85	115	30	118	128	10
17 R	F	44	105	120	15	124	124	0
18 L	F	62	83	125	42	116	132	16
19 L	F	46	110	130	20	118	132	14
20 L	F	58	80	110	30	135	145	10
21 R	F	64	55	110	55	112	130	18
Mean		49	67	118	45	102*	123	21*
S.D.			31	23	22	22	17	14

* $P<0.01$.

The range of flexion increased in 18 elbows, decreased in four and was maintained in one. Four elbows lost from 5 to 55 degrees. The average range of flexion was 118 degrees before and 123 degrees after surgery.

The flexion contracture decreased in all but one of the 23 elbows. The average contracture was 45 degrees before and 21 degrees after surgery (Table 1).

There was an improvement in the function of the elbow joint after surgery; all patients gained more than 15 points of ADL score. They acquired the ability to carry out such activities as combing their hair and washing their faces.

For all elbows, the average preoperative total score was 46 (15–75) points and postoperatively 81 (50–100) points. Most of the patients were satisfied with the results. Although the criteria did not include changes in range of forearm rotation, pro- and supination improved in 20 elbows and was unchanged in two elbows. Only one patient had a loss of pronation.

There was no major complication. Three patients had slight instability when a valgus stress was applied to the elbow after surgery. However, no patients complained of any symptoms related to this instability. One patient noted ulnar paresthesia after surgery.

Discussion

Synovectomy of the elbow has been recognized as a useful procedure in providing relief of pain in rheumatoid patients. However, several studies have reported that little improvement of elbow motion could be expected in advanced stages, and some elbows developed ankyloses (Inglis et al. 1971, Marmor 1972, Wilson et al. 1973, Porter et al. 1974, Brumfield & Resnick 1985). The main purpose of our operative procedure was to increase the range of motion, as

well as to give relief of pain. We found that satisfactory improvement was obtained with increased flexion and decreased flexion contracture, which was achieved by total capsulosynovectomy, muscle release, radial head resection, and partial resection of the olecranon and the coronoid process.

Once the anconeus, extensor carpi ulnalis, extensor digitorum communis, brachioradialis, extensor carpi radialis longus and brevis, and supinator muscles are detached subperiosteally from their insertions, the contracted soft tissues are released. With this procedure and the radial head resection, a wide exposure of the elbow joint is obtained, allowing almost complete removal of the contracted joint capsule and synovial tissues, and resection of osteophytes. Thus, capsulosynovectomy can easily be done even on the medial side of the joint without medial incision. There was no immediate recurrency of synovitis, possibly because the synovectomy was complete.

Resection of the radial head is supposed not only to give relief of pain, but also to improve motion (Tayler & O'Conner 1964, Eichenblat et al. 1982). Furthermore, by partial resection of the olecranon and the coronoid process, all the mechanical blocks for flexion-extension are removed.

In our study, 12 elbows were classified as anatomical Stage 3 and one as Stage 4, and the radiographs of these patients showed destructive changes. We believed that a total elbow replacement would have been a better choice of treatment than synovectomy, but they obtained good results which did not deteriorate. Therefore, we recommend this operative procedure even in advanced stages.

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