EXCISION OF THE HEAD OF THE RADIUS IN RHEUMATOID ARTHRITIS

A. R. TAYLOR, S. K. MUKERJEA and N. A. RANA, AYLESBURY, ENGLAND

From the Oxford Regional Rheumatic Diseases Research Centre, Stoke Mandeville Hospital, Aylesbury

The results of excision of the head of the radius in forty-four elbows affected by rheumatoid arthritis are presented. Relief of pain was obtained in 90 per cent and an increase in the range of flexion and extension was seen in 70 per cent. Involvement of the humero-ulnar joint seen radiologically is no contra-indication to the operation; simple excision of the radial head often gives gratifying results. In our experience the relief of pain and increased range of movement have greatly reduced the need for total replacement arthroplasty.

Involvement of the elbow in rheumatoid arthritis may start early in the history of the disease, but surgical treatment is often not considered until a late stage—often not until marked destructive articular changes have occurred. The reasons for this delay are obscure. It may be that early symptoms are slight or that they are overshadowed by those from other major joints. Laine and Vainio (1969), presenting the results of synovectomy, commented: “Too many patients had a long-standing disease which was no longer suitable for synovectomy”.

Excision of the head of the radius in rheumatoid arthritis was advocated by Smith-Petersen, Aufranc and Larson (1943); they reported satisfactory results in fifteen cases. Good results were also reported by Torgerson and Leach (1970) (five cases); by Inglis, Ranawat and Straub (1971) (twenty-eight cases); and by Wilson (1971) (twenty-eight cases).

The purpose of this paper is to present the results of the removal of the radial head, often in conjunction with synovectomy, in forty-four elbows. Personal assessment, clinical state, range of movement and radiological features have been analysed, and the indications for operation are discussed.

MATERIAL

Between 1965 and 1974 the head of the radius has been removed from forty-four elbows in thirty-eight patients, of whom twenty-six were women. The ages ranged from twenty-five to seventy years. The duration of the disease was from four to thirty-nine years and, as it affected the elbow, one to twenty-five years. The length of follow-up was six months to eight years (average five years). All patients were suffering from classical rheumatoid arthritis; only three were sero-negative.

The indications for operation were pain and loss of movement, with consequent loss of function, which had not responded to adequate conservative treatment.

Operation was done using a standard lateral approach. One point is worthy of mention. After removal of the radial head, particularly in those patients with a proliferative synovium and excess of joint fluid, a deep pouch is sometimes to be found extending distally between the radial neck and the adjacent ulna; if present it should be removed. After operation early movements were encouraged.

RESULTS

For the purpose of this review patients were seen at a special follow-up clinic. The results were analysed to determine the relief of pain, the range of movement and the radiological changes. In addition, the patient’s own assessment of the operation was recorded.

Patient’s assessment—In thirty-four cases (77 per cent) the patient rated the operation as excellent or good (Table I). Personal assessment on the whole reflects relief of pain and the consequent improvement in function. A full range of movement is not usually considered important by the patient. Some loss, both of flexion and extension, may in fact go unnoticed.

Surgeon’s assessment—This was based on the relief of pain and the range of movement. The criteria used and the grading are set out in Table II. The assessment was strict, and none was graded as excellent—that is, with no pain and a full range of movement. Thirty-five elbows (79.6 per cent) were, however, rated as good, and only six as poor. Thirty-eight elbows had gained complete or almost complete relief of pain. Only three patients were later considered for total elbow replacement.

At the final review the range of movement was compared with that before operation. Most elbows showed substantial improvement in flexion and extension. Eleven elbows lost extension and eight lost flexion: the loss was never more than a few degrees. Although some elbows lost flexion, and some extension, it was unusual for an elbow to lose both extension and flexion. The total range

N. A. Rana, M.D., F.R.C.S., Department of Orthopaedic Surgery, Northwestern University Medical School, 303 East Chicago Avenue, Chicago, Illinois 60611, U.S.A.
or arc of movement was decreased in only five elbows, and only in one by more than 5 degrees. Gain in movement was noticed within a few weeks of operation and was maintained throughout the follow-up period (Fig. 1). In no patient was there a loss of pronation or supination. **Radiographic features**—All the elbows had arthritis, often severe, at the humero-ulnar joint as well as at the humero-radial joint. At follow-up all the humero-ulnar joints showed further deterioration but this did not appear to influence the clinical results (Figs. 2 and 3).

**DISCUSSION**

The elbow is made up of three components, the humero-ulnar joint, the humero-radial joint and the superior radio-ulnar joint. The integrity of all three is essential for full function. Accompanying such a limitation, it was important to mobilise the joint primarily involved as soon as possible.

The elbow in rheumatoid arthritis has all components involved. Excision of one portion of the joint, the radial head, improves the function of the elbow as a whole, often to a remarkable degree. This improvement is due to the relief of pain and, sometimes, to the removal of a mechanical block.

Although most patients obtained an increase in the movements of the elbow, it is not surprising that a full range of movement was not regained. What is surprising is

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**TABLE I**

**RESULTS: PATIENT'S ASSESSMENT**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number of elbows</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>18</td>
<td>77.4</td>
</tr>
<tr>
<td>Good</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Better</td>
<td>6</td>
<td>13.6</td>
</tr>
<tr>
<td>Same</td>
<td>4</td>
<td>9.0</td>
</tr>
</tbody>
</table>

**TABLE II**

**RESULTS: SURGEON'S ASSESSMENT**

<table>
<thead>
<tr>
<th>Pain</th>
<th>Arc of flexion-extension (degrees)</th>
<th>Number of elbows</th>
<th>Per cent</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td>0</td>
<td>—</td>
<td>Excellent</td>
</tr>
<tr>
<td>None</td>
<td>90 or more</td>
<td>20</td>
<td>79</td>
<td>Good</td>
</tr>
<tr>
<td>None</td>
<td>60-90</td>
<td>15</td>
<td></td>
<td>Good</td>
</tr>
<tr>
<td>Occasional ache or pain</td>
<td>90 or more</td>
<td>3</td>
<td>7</td>
<td>Fair</td>
</tr>
<tr>
<td>Moderate or severe</td>
<td>90 or more</td>
<td>3</td>
<td>14</td>
<td>Poor</td>
</tr>
<tr>
<td>Moderate or severe</td>
<td>Less than 90</td>
<td>3</td>
<td></td>
<td>Poor</td>
</tr>
</tbody>
</table>

**FIG. 1**

The average arc of movement seen before operation compared to that obtained at varying times during the follow-up period. The arc of movement was maintained.
is that the results of this operation are so good, particularly regarding flexion and extension. The joint primarily concerned with this motion is not affected by the operation, except when synovectomy was also done.

Synovectomy of the elbow was first performed by Swett (1923). It is a prophylactic procedure, and is applicable only in joints that have not undergone destruction of the articular cartilage. It is our policy to do a synovectomy only in elbows which show no or very slight changes in the humero-radial joint. Once destructive changes are present with local tenderness, crepitation and pain, which is often severe and felt on pronation and supination, then excision of the radial head is necessary. At this stage of the disease proliferative synovitis is often absent.

In those elbows in which a synovectomy has been combined with removal of the radial head, it is our belief that it is the latter that contributes the most.

Full pronation and supination depend on the integrity of both the superior and inferior radio-ulnar joints. Both may be, and often are, affected in rheumatoid arthritis. To obtain full benefit following removal of the radial head, it may also be necessary to remove the lower end of the ulna. This was done in six of our patients. All obtained a good range of movement, and in none was the stability of the forearm impaired.

The radiographs of many of the patients may appear to indicate that a total replacement is necessary, rather than removal of the radial head. Radiographs before operation should not deter the decision to do the lesser operation. Destructive changes seen in the humero-ulnar joint are no guide to the relief of pain, or to the improvement in movement that can be obtained by removal of the radial head. Finally, although radiological deterioration in the humero-ulnar joint continued during the follow-up period, the range of movement was maintained.

We have notarthrodesed the elbow; it may sometimes be a satisfactory procedure, but not in rheumatoid arthritis which often involves the shoulder, wrist and fingers. Any movement that can be maintained at the elbow is essential.

Removal of the radial head is a simple procedure with few complications. On the other hand, the insertion of a total elbow prosthesis is not. At the present stage of development of these prostheses it is felt that removal of the radial head should always be considered first.

REFERENCES


