RECURRENT DISLOCATION OF THE SHOULDER

Lesions Discovered in Seventeen Cases, Surgery Employed, and Intermediate Report on Results

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Seventeen consecutive cases of recurrent dislocation of the shoulder joint have been operated upon, using the antero-medial approach. This approach gives the operator an opportunity not only to discover in each case the cause of the recurring dislocation, but also to deal with such lesions in the appropriate manner. The superficial muscle plane is split in the delto-pectoral cleft for six to seven inches. The intermediate muscle plane is dealt with by detaching the distal half-inch of the coracoid process with the origins of the coraco-brachialis and short head of the biceps and, having severed the lateral fascial extension, turning these downwards and inwards. The third muscle plane consists of the subscapularis and its tendon; this is incised vertically for two inches, and, with it, the underlying and adherent anterior capsule of the shoulder joint. A good anterior view of the head of the humerus and glenoid is then secured. To view the posterior surface of the head it is necessary to incise some of the anterior fibres of the supraspinatus; with full external rotation, adequate inspection can be made. This is particularly easy when there is a pronounced groove or notch on this surface.

The information obtained in these seventeen cases revealed that the cause of recurring dislocation was always: (1) Some lesion of the anterior support of the head of the humerus, and/or (2) a groove in the posterior surface of the head of the humerus, which made the dislocation possible with less anterior displacement of the humerus. The lesion of the anterior support of the head of the humerus was not always the same, although in the vast majority of cases it consisted of detachment of structures from the anterior lip of the glenoid (Bankart’s lesion). In those cases where no detachment of the anterior structures could be found, but in which there was a defect in the head of the humerus (Group 3), it is presumed that a stretched capsule accounted for loss of anterior support to the head of the humerus. The precise lesions found were (Figs. 1-4):

Group 1. Detachment of the glenoid labrum, capsule and periosteum from the lip of the glenoid plus a groove on the posterior surface of the head of the humerus—eight cases.
Group 2. Detachment of the glenoid labrum and capsule alone—five cases.
Group 3. Groove on the posterior surface of the head of the humerus alone—three cases.
Group 4. Detachment of the subscapularis muscle in its lower half from its insertion into the lesser tuberosity—one case.

Detachment of labrum—Detachment of the glenoid labrum and capsule, on which Bankart has laid so much stress, deserves full description in order to give the widespread recognition which it deserves. The glenoid labrum and capsule, over the lower three-quarters of their attachment to the anterior lip of the glenoid, are detached. With these is raised the periosteum on the front of the neck of the scapula over an area approximately one and a half inches by one inch. The bare bone is an interesting feature in these cases. In only two cases did there appear to be any fibrous covering to the exposed bone, although the detachment must have been present for some years. A deep pocket is formed between the detached periosteum and labrum on the one hand, and the neck of the scapula on the other. Periosteal new bone is often laid down at the limit of periosteal separation. This can be felt at operation and has been detected in radiographs on several occasions (Fig. 7).
Groove in humerus and "hatchet head"—A groove on the posterior surface of the head of the humerus is the usual finding. It is well illustrated in Fig. 6 and its floor has invariably consisted of bare bone. It is to be noted that this groove, when at all pronounced, can be illustrated in pre-operative radiographs. With the X-ray tube in the axilla, the arm abducted to 40 degrees, and the X-ray cassette above the shoulder of the sitting patient, an admirable view of the groove may be obtained. An antero-posterior radiograph often shows marked flattening of the head superiorly and laterally, this being caused by the upper limit of the groove, and giving the "hatchet head" appearance (Fig. 5). It will be noted that in three cases, the dislocation was occurring with an intact anterior capsule, although in each case assisted by a pronounced groove on the posterior surface of the head of the humerus.

Avulsion of subscapularis—There was one interesting case where loss of the anterior support to the head of the humerus resulted from detachment of the tendon of insertion of the subscapularis, with a flake of bone, from the lesser tuberosity. When the coracobrachialis and short head of biceps were retracted, there was an unimpeded view into the lower half of the joint (Fig. 8).
Case 3—Right shoulder, the site of ten dislocations in five years. The antero-posterior radiograph shows the upper limit of the posterior groove in the head of the humerus, giving rise to the appearance described as the "hatchet head."

Case 6—Subperiosteal new bone formation at the limit of periosteal detachment from the neck of the scapula.

Case 12—Detachment of half the subscapularis (B) from the lesser tuberosity of the humerus. (A, coracoid; C, coraco-brachialis)
OPERATIVE TREATMENT

The operation performed on these seventeen cases depended naturally on the cause found on exploration. For the detached glenoid labrum a modification of Bankart's operation was employed. It was found possible to remove part of the cortex of the neck of the scapula to form two horizontal gutters, leaving a stout bridge of bone coming right up to the lip of the glenoid between them. A stout No. 6 silk thread was passed under this bridge at its glenoid end, and used to tie the labrum, periosteum, and capsule firmly down in place. To execute this manoeuvre, it will be found necessary to observe the following points:

1. Keep the head of the humerus in full internal rotation, which brings the neck of the scapula into better view.
2. Employ a Travers fixed retractor between the capsule attached to the head of the humerus laterally, and the detached coraco-brachialis and short head of biceps medially. This also keeps the more superficial muscles well retracted.
3. Use a quarter-inch chisel, driven into the body of the scapula, to retract the detached glenoid labrum and subscapularis. This gives an admirable view of the neck of the scapula (Fig. 9).
4. Employ a sucker to keep the wound dry.
5. Use a strong cutting hook, pierced at the tip, to pass the silk suture through the cancellous bone beneath the cortical bridge. (Those illustrated in Fig. 11 were made from Steinmann pins.)

![Fig. 9](image)
Repair of detachment of the labrum, capsule, and periosteum (Bankart's lesion). The bare area is displayed by a chisel in the bone acting as a retractor. Two gutters are gouged in the neck of the scapula. The suture will be passed beneath the intervening bridge at its glenoid end.

![Fig. 10](image)
When the lesion is not a detachment of the labrum but a groove in the head of the humerus, an anterior bone block is advisable. An iliac bone graft to the neck of the scapula prolongs the anterior lip of the glenoid. The diagram shows the surgical approach, and the graft and screw.

Two bridges have been constructed in some cases but one is sufficient tax on the operator. The subscapularis has to be separated from the capsule before the suture is tied deep to this muscle. This variant of Bankart's operation avoids working on the cartilage surface of the joint, and the greater roughening of the neck of the scapula can result only in more effective reattachment of the detached structures. It is felt that a silk suture is better than the use of staples, as employed by the Johannesburg school of orthopaedic surgeons. Such staples, if they become detached, are poor neighbours to a variety of axillary structures! (Fig. 12.)
The difficulty of passing a suture through the bone is solved by using strong cutting hooks, pierced behind the point, made from Steinmann pins and held in a Steinmann pin handle.

Antero-posterior and supero-inferior radiographs, six years after repair of Bankart's lesion by three staples according to the technique of the Johannesburg school. A fourth staple, used for reattaching the coracoid process, has become detached and is in two pieces. No recurrence of dislocation; full range of movement; some slight aching.

When a humeral groove is present in addition to a lesion of the anterior support of the head of the humerus, treatment of the latter alone was deemed sufficient. When dislocation was occurring within what appeared to be no more than stretched anterior tissues, and was primarily attributable to the humeral groove, some other form of surgery was considered necessary. Multiple osteotomy of the coracoid process was performed in two cases but more recently a bone graft, comprising the whole thickness of the iliac crest, has been screwed on to the anterior surface of the neck of the scapula beneath the subscapularis muscle, the periosteum being incised vertically to give bone contact (Fig 10).
### Analysis of Seventeen Cases of Recurrent Dislocation of the Shoulder

<table>
<thead>
<tr>
<th>Case No</th>
<th>Age</th>
<th>Sex</th>
<th>Occupation</th>
<th>Previous operations</th>
<th>Findings at operation</th>
<th>Operation performed</th>
<th>Interval since operation</th>
<th>Follow-up report</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>M.</td>
<td>Army</td>
<td>--</td>
<td>Bankart's lesion</td>
<td>Bankart's operation</td>
<td>4 years</td>
<td>No reply.</td>
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<tr>
<td>2</td>
<td>22</td>
<td>M.</td>
<td>Army, Clerk</td>
<td>Yes</td>
<td>Yes (shallow) Loose body</td>
<td>Bankart's operation</td>
<td>2.5 years</td>
<td>No dislocation; vigorous tennis; occasional dull ache.</td>
</tr>
<tr>
<td>3</td>
<td>27</td>
<td>M.</td>
<td>Army, Building Maintenance</td>
<td>None</td>
<td>Yes (deep)</td>
<td>Coracoid osteotomy</td>
<td>2.5 years</td>
<td>No dislocation; as strong as other; no complaints.</td>
</tr>
<tr>
<td>4</td>
<td>27</td>
<td>M.</td>
<td>Army, Labourer</td>
<td>None</td>
<td>Yes (shallow) Loose body</td>
<td>Coracoid osteotomy</td>
<td>2.5 years</td>
<td>No dislocation; no complaint.</td>
</tr>
<tr>
<td>5</td>
<td>26</td>
<td>M.</td>
<td>Army, Upholsterer</td>
<td>Yes</td>
<td>None</td>
<td>Bankart's operation</td>
<td>2.5 years</td>
<td>No dislocation; aches with hard use.</td>
</tr>
<tr>
<td>6</td>
<td>24</td>
<td>M.</td>
<td>Army, Manufacturer</td>
<td>Clairmont operation</td>
<td>Yes (moderate)</td>
<td>Bankart's operation</td>
<td>2.5 years</td>
<td>No dislocations; plays rugby; no complaints.</td>
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<tr>
<td>7</td>
<td>29</td>
<td>M.</td>
<td>Army, Truck Driver</td>
<td>Yes</td>
<td>None</td>
<td>Bankart's operation</td>
<td>2 years</td>
<td>No dislocation; heavy lifting; cricket; no complaints.</td>
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<tr>
<td>8</td>
<td>27</td>
<td>M.</td>
<td>Army, Tool Grinder</td>
<td>Nicola operation</td>
<td>Yes</td>
<td>Bankart's operation</td>
<td>2 years</td>
<td>No dislocation; occasional ache.</td>
</tr>
<tr>
<td>9</td>
<td>17</td>
<td>M.</td>
<td>Clerk</td>
<td>-- but labrum in situ</td>
<td>Yes</td>
<td>Bankart's operation</td>
<td>1.5 years</td>
<td>No dislocation; occasional ache.</td>
</tr>
<tr>
<td>10</td>
<td>24</td>
<td>M.</td>
<td>Research Chemist</td>
<td>None</td>
<td>Yes</td>
<td>Iliac bone graft to scapula</td>
<td>1.5 years</td>
<td>No dislocations; can bowl overarm; not as strong as normal.</td>
</tr>
<tr>
<td>11</td>
<td>31</td>
<td>M.</td>
<td>Army, Shop Assistant</td>
<td>Yes</td>
<td>? (No note)</td>
<td>Bankart's operation</td>
<td>1.5 years</td>
<td>No dislocation; no sport; feeling of weakness in shoulder.</td>
</tr>
<tr>
<td>12</td>
<td>17</td>
<td>F.</td>
<td>Schoolgirl</td>
<td>None</td>
<td>None</td>
<td>Subscapularis re-attached</td>
<td>1 year</td>
<td>No dislocation; some ache with violent use.</td>
</tr>
<tr>
<td>13</td>
<td>52</td>
<td>M.</td>
<td>Carpenter (Tabetic patient)</td>
<td>Yes</td>
<td>Flake of bone detached as well</td>
<td>Iliac bone graft to scapula (Tabetic patient)</td>
<td>1 year</td>
<td>No dislocation; hard at work with no complaints.</td>
</tr>
<tr>
<td>14</td>
<td>23</td>
<td>M.</td>
<td>Leather Dresser</td>
<td>Yes</td>
<td>Yes (deep)</td>
<td>Bankart's operation</td>
<td>4 months</td>
<td>Too recent for follow-up</td>
</tr>
<tr>
<td>15</td>
<td>22</td>
<td>M.</td>
<td>Builder's Labourer</td>
<td>Yes</td>
<td>Yes (shallow)</td>
<td>Bankart's operation</td>
<td>3 months</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>23</td>
<td>M.</td>
<td>Engineer</td>
<td>Yes</td>
<td>Yes (moderate)</td>
<td>Bankart's operation</td>
<td>1 month</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>27</td>
<td>M.</td>
<td>Builder</td>
<td>Yes</td>
<td>Yes (shallow)</td>
<td>Bankart's operation</td>
<td>1 month</td>
<td></td>
</tr>
</tbody>
</table>
RECURRENT DISLOCATION OF THE SHOULDER

The one case of detachment of the insertion of subscapularis from the lesser tuberosity of the humerus was dealt with by reattachment with a silk suture through bone.

In closing these wounds, the capsule and subscapularis were always sutured independently and the detached portion of the coracoid process was reattached. Far from the subscapularis being a causative factor in dislocation as was once taught, its careful repair is an important point in ensuring a successful result. The anatomical repair of both the lesion, and the incision of approach, should be complete.

The arm was always kept by the side for four to six weeks. After this, physiotherapy and exercises were used unrestrainedly to regain movement, almost a full range being obtained in about six weeks. The period of four to six weeks with the arm by the side would appear to be essential in order to obtain biological repair of the lesion. No matter how well placed and securely tied, a single suture of silk cannot be relied upon for repair.

RESULTS OF TREATMENT

There was no epileptic case in this series. There was one case of a tabetic patient with a Charcot's knee. Two cases had previously been subjected to unsuccessful operations, one a Nicola operation and the other a Clairmont operation. None of the twelve cases which have been traced in the follow-up has had recurrence of the dislocation. All appear very satisfied with their results. One is playing rugby football again (not first-class rugby as formerly, but after an unsuccessful Clairmont operation and a successful Bankart operation, he is loath to hazard too much on the field of sport). All are back at their former employment, sometimes of a very strenuous nature.

DISCUSSION

It would appear from these cases that some lesion of the anterior support of the humeral head is the common cause of recurrent dislocation of the shoulder (Bankart's lesion in thirteen out of seventeen cases); and that the notch or groove on the posterior surface of the head of the humerus is usually present and is an important factor in making dislocation possible with less forward displacement of the humeral head. In some cases, recurrent dislocation occurs with a pronounced humeral groove and no detectable lesion of the anterior capsule or of the subscapularis muscle. In these alone is it necessary to do more than repair the lesion to the structures normally supporting the head anteriorly. In this series, dislocation has not recurred since operation, although wherever possible, surgery was confined to simple repair with a silk suture (Bankart's operation).

The lesion to the tissues supporting the head of the humerus anteriorly undoubtedly occurs at the initial dislocation and it is to be presumed that the posterior humeral groove has a similar traumatic origin. Is it of the nature of a depression fracture, the cartilage being shed subsequently? Although in two cases only was a small loose body removed from the joint, this explanation would appear to be the most reasonable. The congenital origin of the posterior groove, as postulated by Tavernier and his colleagues, does not seem probable.

While in all these cases we have found certain lesions, which are being widely recognised as commonly associated with the condition of recurrent dislocation of the shoulder, we are still in ignorance as to the frequency of such lesions in simple dislocations of the shoulder. In one case of acute dislocation of the shoulder, associated with a fractured neck, in which open operation was needed to reduce the dislocation, classical detachment of the labrum was revealed at operation. Was this the initial lesion in a recurring dislocation of the shoulder? Do degrees of separation of the labrum occur without recurrence of the dislocation? In the absence of a humeral groove, does the shoulder often remain stable in the presence of a separated labrum and capsule? Can the theory of a difference in the type of trauma in simple and recurring dislocations be substantiated? There are many questions yet to be answered in this interesting condition.
SUMMARY

1. The operative findings in seventeen cases of recurrent dislocation of the shoulder are presented and discussed. Detachment of the glenoid labrum (thirteen cases) and the formation of a posterior humeral groove (eleven cases) were the most consistent findings.

2. In one case recurrent dislocation of the shoulder was due to avulsion of the subscapularis muscle.

3. The surgical treatment of these cases is described, usually consisting of a modification of Bankart’s operation.

4. The results of follow-up are given as an intermediate report. No post-operative dislocation has so far been reported.

REFERENCES


DISCUSSION

on Recurrent Dislocation of the Shoulder

Mr A. Bernard Pain (Leeds)—I have analysed the case records, in hospitals of the Leeds area, of patients treated by operation for recurrent dislocation of the shoulder during a fifteen-year period. Forty-five operations were performed on thirty-three patients (one bi-lateral, seven operated upon twice, two operated upon three times). Twenty-six were males and seven were females. As to the cause, the primary dislocation occurred eight times in football accidents and six times in epileptic fits; the other nineteen were due to falls of various types, in one instance the dislocation being due to suspension of the body by the limb concerned. These cases represent the work of my colleagues and myself, and sometimes of unknown surgeons whose previous operations have failed. Three were dealt with by simple division of the subscapularis and the operation was successful in two cases. One capsular reefing succeeded. The only Clairmont operation traced was unsuccessful. Of two Bankart operations one failed and the other succeeded. The majority of the traced cases fall into three groups—

Henderson sling operation. Of thirteen fascial or tendon sling operations there was recurrence in nine. It should be noted that recurrence of dislocation took place in every single case treated by slings of fascia lata, and in four of seven cases treated by slings constructed from the peroneus longus. The Henderson sling operation is very disappointing. Of three cases operated upon for the second time—one by tendon sling for failure of a previous fascial sling, one by second fascial sling for failure of a previous fascial sling, and one by fascial sling for failure of a previous Nicola operation, the secondary operation failed in every case. Slings of fascia lata are to be condemned as being of no use, and slings of transplanted tendon are very unreliable.

Nicola operation. Twelve Nicola operations were traced. One man had the operation performed on both shoulders ten years ago and there has been no recurrence since. In three cases there was recurrence within twelve months of operation; and in a fourth case, recurrence took place as long as seven years after operation. Thus the operation failed in one-third of the cases.

Anterior bone block. An iliac bone graft has been inserted near the edge of the glenoid cavity to provide an anterior bone block in four cases. These were treated in 1944, 1946, and 1947, and in no case has there yet been a redislocation. The number of cases is small but the procedure appears to be reliable. I wish to thank my colleagues in Leeds for permission to follow up their cases.

Mr A. S. Blundell Bankart (London)—The results of the operative treatment of recurrent dislocation of the shoulder can be stated very briefly. There is only one rational operation for this condition; it is applicable to every genuine case of anterior recurrent dislocation; it is almost foolproof; and, when it is properly done, the patient is cured—the dislocation never recurs and the patient rapidly regains full use of his arm. I have no figures; but I have probably done this operation more often than anyone else,