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Department of Surgery and Department of Orthopaedics, Nilratan Sircar Medical College and Hospitals, and Department of Surgery, Institute of Child Health and Post-Graduate Education, Calcutta, India.

ROTATION OSTEOTOMY OF THE SHAFT OF THE HUMERUS FOR RECURRENT DISLOCATION OF THE SHOULDER: ANTERIOR AND POSTERIOR

G. K. CHAUDHURI, A. SENGUPTA & A. K. SAHA

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One of the methods for restoration of dynamic stability is by rotating the upper fragment after osteotomy of the shaft of the humerus, externally in recurrent anterior dislocation and internally in recurrent posterior dislocation (Saha 1961, 1967, 1969 and 1971).

Similar restoration should be possible by rotating the lower fragment after osteotomy in the opposite direction. The following sixteen cases demonstrate that the rotation of the lower fragment is equally effective (Figures 1, 2 and 3).

MATERIAL

Sixteen cases were selected for rotation of the lower fragment after transverse osteotomy of the shaft of the humerus. Fifteen had recurrent anterior dislocation of whom six were spontaneous and the remaining nine had a traumatic first episode. One case had spontaneous recurrent posterior dislocation. He could dislocate at will by adduction while the glenohumeral joint was flexed at 100°.

Selection was made on the basis of investigation. Fifteen cases had retrotorsion from 32° to 48°. The remaining case, who had posterior dislocation, had 14° retrotorsion. The glenohumeral indices were within normal limits. The glenoid tilt was 0° in four cases and 4° to 15° posteriorly in eleven cases and in one case 8° anteriorly. Four of the cases belong to the Bengal Police Service.

METHOD

All cases had a transverse osteotomy of the shaft of the humerus and, except one, the distal fragment rotated internally through an angle of between 20° and 30°. The case with recurrent posterior dislocation had the distal fragment rotated externally through 25° to make the joint stable while adducting in a flexed position (the

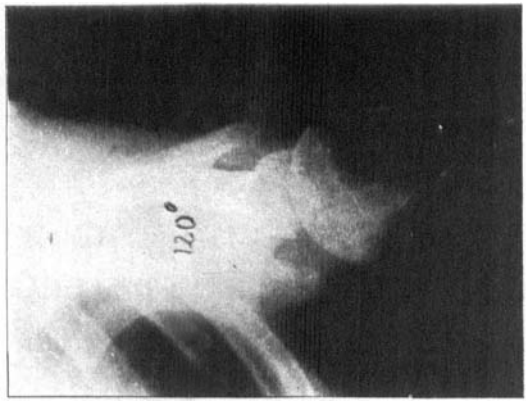

Figure 1. Axial skiagram of the normal glenohumeral joint in 120° abduction and full external rotation showing a small part of the articular surface near lesser tuberosity and adjoining postero-superior sector of the humeral head in contact with the glenoid. Most of the articular surface is anterior to the glenoid cavity. Dynamic stability of the joint is maintained normally in this precarious state if the power of horizontal steerers, glenoid tilt and retrotorsion are optimum.

reverse of that of recurrent anterior dislocation). Osteotomy sites were low in four cases and high in the remainder. The latter by itself reduced the time of union.

Special compression plates (Sengupta et al. 1972) were used in nine cases with the oblique screw pointing upwards toward the head. The cortex of the shaft near the neck is thin and gradually merges with the spongy bone below the articular surface of the head of the humerus. In order for the compression given by the oblique screw

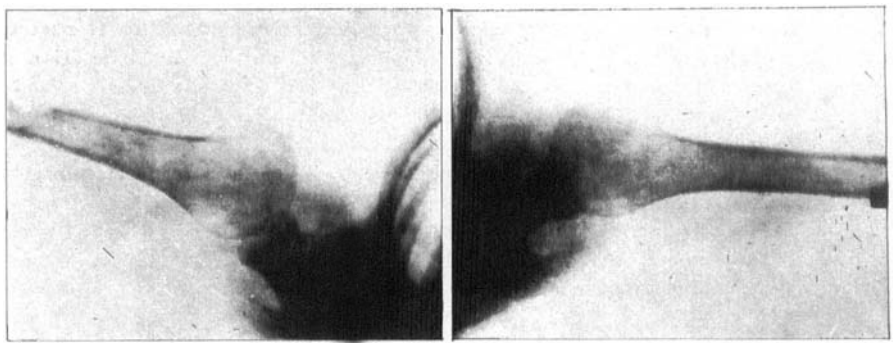

Figure 2. Axial skiagram of both the glenohumeral joints in 120° abduction and full external rotation. The contact surface is increased in a case of recurrent anterior dislocation by operative reduction of retrotorsion of the right humerus from 48° to 18°. On the unoperated side though the skiagram is identical with that of Figure 1, dynamic stability is normally maintained as there is no recurrent anterior dislocation.

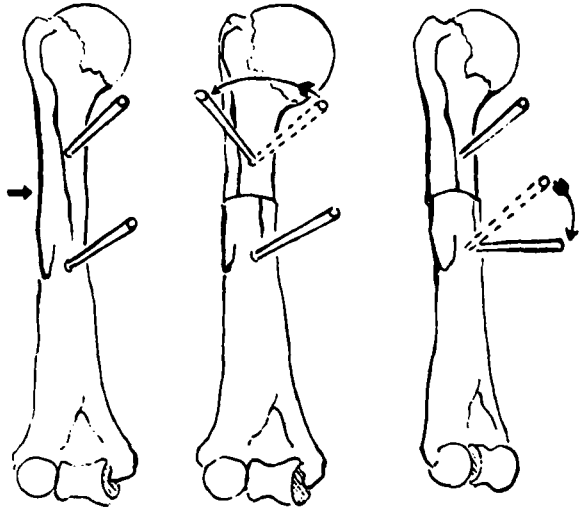

Figure 3. Reduction of retrotorsion after osteotomy may be either by rotating the upper segment outwards or the inner segment inwards in recurrent anterior dislocation.

to be effective it should take bite of both the cortices. Therefore, the site of osteotomy selected was quite low. This procedure was followed till 9.2.72, and considerably reduced the time for union. In two cases no plaster immobilisation was necessary.

In order to make the osteotomy site sufficiently high the compression plate is reversed so that the oblique screw points downwards (Figure 4). This procedure enables us to get (a) fixed high site of osteotomy and (b) effective compression due to the oblique screw taking bites of both the well-formed cortices.

On account of the follow-up being less than one year, the cases are not reported.

RESULTS

Those cases with low osteotomy took 2½ to 9 months for union. The remaining cases took 3 to 6 weeks for clinical union. Some of these had compression plates. After rehabilitation they had full range of movement and no recurrences. All the members of the Police force included in this series have gone back to their normal duties (Table 1).

CONCLUSION

Osteotomy with internal rotation of the lower fragment is equally effective in preventing recurrent anterior dislocation and gives a stable

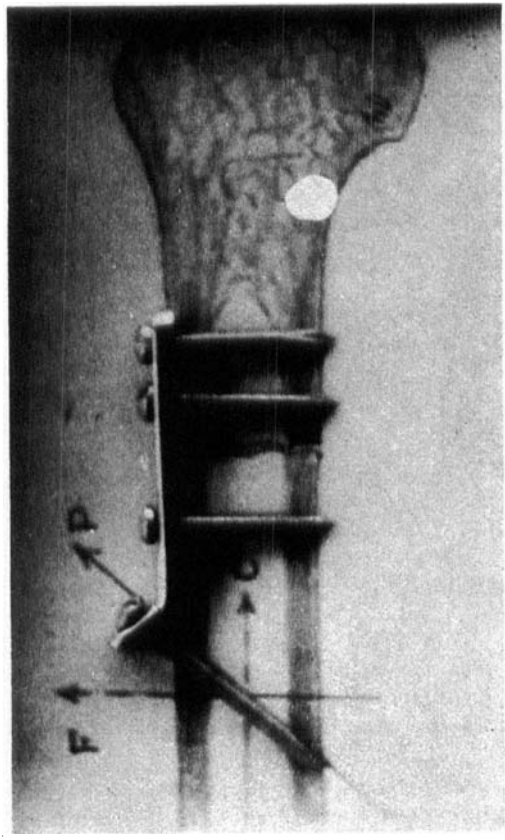

Figure 4. After rotation osteotomy the fragments are fixed by a special compression plate. The oblique screw should point downwards to take bite of both the well-formed cortices. Thus the osteotomy site is fixed and high.

glenohumeral joint. To facilitate union, the site of osteotomy should be high and a special compression plate should be used.

One case of recurrent posterior dislocation of the left glenohumeral joint was treated where the lower fragment was rotated externally in the opposite direction. This case had right recurrent anterior dislocation which was treated by latissimus dorsi transfer in 1966, with excellent results and no recurrence to date. It was seen in the follow-up radiograph that the contact surfaces of both the glenohumeral joints were increased and comparable in adduction and abduction.

SUMMARY

Fifteen cases of recurrent anterior dislocation with gross retrotorsion of the upper end of the humerus were selected for rotation osteotomy. In all of these, after transverse osteotomy, the distal segment was

Table 1.

Name	Age in years	Side	Onset S-spontaneous T-traumatic	Date of onset	Recurrences	Retrotorsion	Glenoid tilt A-anterior P-posterior	Glenohumeral indices vertical	transverse	Date of operation	Compression plate used	Speed of union (in months)
Recurrent anterior dislocation												
M.K.	21	R	T	1968	many	48°	0°	76%	59%	3.2.70	No	6
D.D.	22	R	T	1967	many	35°	4° P	73%	58%	19.2.70	No	3½
P.M.	20	R	S	1968	many	40°	5° P	77%	58%	2.4.70	No	3
A.R.	36	L	T	1965	many	32°	8° P	76%	59%	23.7.70	No	9
A.C.	15	L	T	1970	6 times	35°	6° P	75%	56%	13.8.70	No	2½
B.M.	21	R	S	1968	5 times	37°	8° P	81%	60%	27.8.70	No	2½
M.R.	25	R	T	1966	many	40°	8° P	75%	56%	9.2.71	Yes	1½
N.D.	28	L	S	1968	30 times	38°	5° P	–	–	11.2.71	No	2½
O.A.	30	L	T	1967	22 times	40°	0°	–	–	15.3.71	Yes	1
A.H.	22	R	T	1969	12 times	40°	0°	–	–	17.3.71	Yes	1
A.R.	26	L	S	1966	5 times	42°	5° P	–	–	10.4.71	Yes	1
A.B.	18	R	S	1970	3 times	36°	0°	–	–	4.5.71	Yes	1
R.A.	17	L	T	1970	4 times	40°	8° P	–	–	20.10.71	Yes	1
A.M.	25	L	T	1960	many	35°	6° P	78%	56%	19.1.72	Yes	¾
S.D.	34	R	S	1959	60–70 times	38°	8° A	79%	58.3%	9.2.72	Yes	1
Recurrent posterior dislocation												
A.G.	26	L	S	1966	many	14°	15° P	76%	57%	28.10.72	Yes	1

rotated internally. In one case of recurrent posterior dislocation it was rotated externally. This restores the stability of the glenohumeral joint.

The time of union was minimised by high osteotomy and use of a special compression plate.

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Correspondence to:

G. K. Chaudhuri
99/5/15 Ballygung Place
Calcutta 19
India