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Recurrent anterior dislocation of the shoulder

Results of Eden-Hybbinette and Putti-Platt operations

The results of surgery in 74 cases of recurrent anterior dislocation of the shoulder are reported. The procedures used were Eden-Hybbinette (E-H) in 48 cases and Putti-Platt (P-P) in 26 cases.

The recurrence rate in the 62 shoulder joints re-examined some 4 years postoperatively was 3/41 in E-H cases and 3/21 in P-P cases. The clinical results were excellent in 46 cases, satisfactory in 11, unsatisfactory in four and poor in one case without notable difference between the methods. A restriction of the outward rotation of more than 10 degrees could be observed in half the cases regardless of method.

Radiographically, the Bankart lesion of the glenoid rim could be observed in two-thirds of the cases and osteoarthrosis of the glenohumeral joint was evident in one tenth. The transplanted bone block used in the E-H reconstruction was still in position in the majority but some degree of resorption could usually be observed. These observations did not correlate with the clinical results.

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The two most common operations for recurrent anterior dislocation of the shoulder in the Scandinavian countries have long been those described by Eden (1918), and Hybbinette (1932) (Hublin 1946, Palmer & Widen 1948) and by Putti Platt (Osmond-Clarke 1948).

During recent years, the Bankart (Bankart 1938, Rowe 1962) and coracoid transfer (Bristow-Helfet, Bristow-Latarjet, Boytchev) operations have gained popularity at the expense of the former methods (Hovelius et al. 1979, 1983).

We have now made a retrospective, comparative study of the results of the consecutive Eden-Hybbinette and Putti-Platt operations performed in our department. Shoulder function, radiographic findings and recurrences were taken into account.

Patients and methods

Seventy-four shoulder joints in 54 men and 13 women were operated for recurrent anterior dislocation (RAD) during the years 1974 to 1981 at the Surgical Hospital, Helsinki University Central Hospital.

The mean age of the patients at the time of primary dislocation was 20 (12–70) years. The interval between the first traumatic dislocation and the operation ranged from 1 to 5 years in 45 cases, from 6 to 10 years in 25 cases and was more than 10 years in four cases. The shoulder on the dominant side was operated in 47 cases and on the non-dominant side in 27 cases. Prior to surgery, dislocation had occurred 10 times or less in 32 cases, 10–20 times in 17 cases and more than 20 times in 14 cases.

The Eden-Hybbinette (E-H) operations (48 cases) were performed strictly according to the original method (Eden 1918, Hybbinette 1932, Palmer & Widen 1948). The bone graft was taken from the iliac crest in all cases and placed intra-articularly into a subperiosteal pocket. In Putti-Platt (P-P) procedures (26 cases), we preferred to separate the capsule from the subscapularis muscle and to imbricate them individually (Leach et al. 1982). No attempts were made to suture the capsule into the rim of the glenoid. The limb was immobilized in a collar-and-cuff for 6 weeks postoperatively. Pendulum exercises were encouraged at 3 weeks and active exercises supervised by a physiotherapist were begun at 6 weeks postoperatively.

Sixty-one patients, with 62 operated shoulders were examined by the authors 4 (1–7) years after the operation. The functional results were evaluated according to the criteria described by Neer (1970) for a total maximum score of 100 units. In all patients the rotational movements were measured at zero degrees of abduction (Leach et al. 1982).

During the re-examination, routine radiographs in two projections were used: patient in upright position with antero-posterior 40 degrees oblique and humerus in internal rotation, and patient supine with axillary view and slightly externally rotated humerus. The radiographs were carefully scrutinised for degenerative changes with soft-tissue calcifications, the presence of a Bankart or Hill-Sachs lesion and the fate of the transplanted bone block.

Results

Of the 62 shoulder joints available for re-examination, 41 were operated on according to the E-H and 21 according to the P-P method (Table 1). The groups did not differ with regard to age at surgery or sex distribution.

Table 1. Function following operations for recurrent dislocation of shoulders

Estimation	Operation performed	
	Eden-Hybbinette No. of cases	Putti-Platt No. of cases
Pain in the shoulder		
None	21	13
Slight or occasional	14	5
Moderate	5	3
Marked	1	–
Working ability		
Good	40	21
Impaired	1	–
Restriction of external rotation		
Under 10 degrees	21	9
10 to 30 degrees	19	12
31 to 50 degrees	1	–
Neer classification		
Excellent 100–89 units	30	16
Satisfactory 88–80 units	7	4
Unsatisfactory 79–70 units	3	1
Failed <70 units	1	–
Recurrence	3	3

The Neer score was excellent in 46 cases (30 E-H/16 P-P), satisfactory in 11 (7/4), unsatisfactory in 4 (3/1) and poor in one case (1/0).

After both operations, the majority had no or only slight or occasional pain. There was only one case with marked pain and seriously limited activity. The range of motion, especially abduction, flexion and extension, was not significantly reduced. A reduction of more than 10 degrees in external rotation was found in half the cases.

According to the radiographs the transplanted block was still in position in 36 of the 41 (E-H) cases; it was dislocated but visible in five cases and invisible in two cases. Total or moderate resorption of the bone block was verified in 32 cases (Figure 1). The fate of the bone block according to the radiographs did not correlate with the clinical results. The Bankart lesion of the glenoid rim was seen radiographically in one third of the cases and the Hill-Sachs defect on the postero-lateral aspect of the humeral head in three quarters. Calcifications in the rotator cuff were observed in eight cases and signs of osteoarthrosis of the glenohumeral joint in five cases.

In the Putti-Platt group, the Bankart and Hill-Sachs lesions were observed in two thirds of the cases. A calcified deposit in the subscapularis tendon near its insertion in the tuberculum minor (Figure 2) was seen in half of the radiographs. Signs of osteoarthrosis in the glenohumeral joint were evident in one tenth.

In the whole series there were six recurrences. Three of these occurred after the E-H reconstruction and three after the P-P operation. A new trauma was the main aetiological factor in two cases, one epileptic case included. In one E-H case a technical error might have been the cause of the recurrence, because the transplanted bone block was placed in the wrong position.

Four of these recurrent cases underwent re-operations. Two primary P-P operations were converted into E-H reconstructions with excellent results. Two primary E-H cases were re-operated using the same method with larger transplanted bone blocks. One of these developed redislocation while the other had an excellent result. There was only one postoperative wound infection in the whole series.

Figure 1

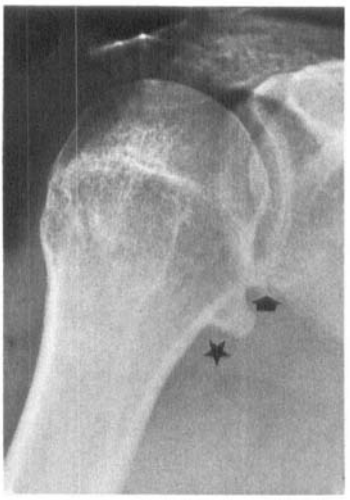

Figure 2A

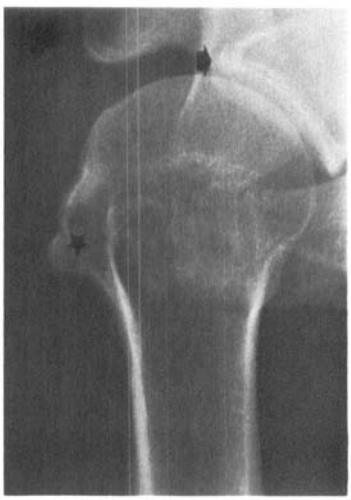

Figure 2B

Figure 1. A radiograph of the shoulder joint taken 4 years after reconstruction with the E-H method. The transplanted bone block is still in position but is resorbed (arrow). Note also the large Hill-Sachs defect on the posterolateral surface of the humeral head (asterisk).

Figure 2. A radiograph of a shoulder joint taken 3 years after reconstruction with the P-P method. Both the antero-posterior (A) and the axillary (B) views reveal a typical calcification of the subscapularis tendon near its insertion into the tuberculum minor (asterisk). Note also the presence of the Bankart lesion with slightly eroded configuration of the anterior glenoid rim (arrow).

Discussion

According to recent studies, the subscapularis muscle and the anterior part of the joint capsule (glenohumeral ligaments) provide the stability in an intact glenohumeral joint (Kummel 1979, Turkel et al. 1981). Several authors have tried to discover the aetiological factors and natural history leading to recurrent luxation after the primary trauma. A review of the earlier literature revealed a consensus of opinion that the primary dislocation of the shoulder should be immobilized from 3 to 6 weeks, but a high recurrence rate could still be expected. In a recent comparative study by Henry & Genung (1982), however, the length of the immobilization had no effect on the recurrence rate, and all the re-dislocations occurred within 18 months of the initial injury. Further, in the report by Cyprien et al. (1983), radiographic techniques did not reveal any anatomical differences in shoulders with recurrent anterior dislocation when compared with the normal ones.

There are some common features in the case histories of these patients; traumatic dislocations account for approximately 95 per cent of all anterior dislocations (Rowe 1962, Henry & Genung 1982), and re-dislocation seems to occur quite soon after the primary injury, usually within 2 years (Henry & Genung 1982, Hovelius et al. 1983). These facts were also confirmed here.

Bankart (1938) pointed out that the essential lesion was a detachment of the glenoid labrum and that the dislocation never recurred unless there was a tear in the glenoid labrum. The high incidence of defects of the glenoid rim was later confirmed by several authors (Langenskiöld 1939, Hublin 1946, Dickson & Devas 1957). This was also the case in the present study, where radiography revealed the Bankart lesion in about two thirds of the cases (Figure 3). Unfortunately, there was no mention of the status of the labrum in most of the surgical descriptions, but detachment of the labrum might be evident in even more cases than shown by radiographic analysis. In the later stages of the disease, the presence of the Hill-Sachs lesion on the postero-lateral surface of the humeral head may subject the patient to further dislocations (Figure 1).

Table 2. The rates of recurrence reported by various authors after reconstruction of recurrent anterior dislocation of the shoulder with Eden-Hybbinette and Putti-Platt procedures.

Author(s)	Rates of recurrence (%)
Eden-Hybbinette	
Hybbinette (1932)	0
Lindholm (1974)	4
Hublin (1946)	5
Palmer & Widen (1948)	6
Skogland & Sundt (1973)	13
Solonen & Rokkanen (1972)	16
Putti-Platt	
Lipscomb (1975)	0
Leach et al. (1982)	1
Morrey & Janes (1976)	1 (1 year) 11 (5 years)
Hovelius et al. (1979)	19
Tervo et al. (1979)	35

No significant differences in the functional results could be observed between the two groups reviewed here, with the majority excellent or satisfactory 4 years postoperatively. The rate of recurrence was at about the middle of those reported in the literature (Table 2).

The original Putti-Platt method was designed to reduce the outward rotation by about 20–25 degrees (Osmond-Clarke 1948), and later reports and modifications have not changed this goal (Leach et al. 1982). Restriction of external rotation by 10–30 degrees after the P-P operation was observed in half of the cases. None of the patients complained about this reduction of the external rotation. The strength of the reconstruction and restriction of the outward rotation may subside and lead to a higher incidence of recurrences with long-term follow-up (Morrey & Janes 1976). mean follow-up time in the present study was 4 years and this may partly explain the higher rate of recurrences in the P-P group.

A capsulorraphy was also performed in conjunction with the bone block operation, and as a rule the subscapularis was shortened, too. This may explain the restriction of the outward rotation in the E-H group. It also may explain why the radiographic fate of the transplanted bone block did not correlate with the clinical results (Solonen & Rokkanen 1972, Lindholm 1974).

The experience gained from the present series indicates that use of the P-P operation should be restricted to patients who do not participate in any particular physical training activity (Hovelius et al. 1979, Tervo et al. 1979). Making the duplicature of the anterior part of the joint in two layers may increase the strength of the P-P reconstruction (Leach et al. 1982) and restriction of external rotation up to 20 degrees is acceptable. The use of E-H reconstruction may be recommended, especially in cases with an eroded or fractured anterior glenoid rim (Palmer & Widén 1948, Rowe 1962, Tervo et al. 1979). Shortening of the subscapularis tendon can be combined with the bone block method and the transplanted bone block must be large, because it is usually intended that it be resorbed (Palmer & Widen 1948).

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