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RECURRENT ANTERIOR DISLOCATION OF THE SHOULDER

The Eden-Hybbinette Operation

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A number of operative procedures have been tried in the treatment of recurrent anterior dislocation of the shoulder. In Scandinavia the Eden-Hybbinette method is the one most often used, with or without modifications. The technique was described by the German, Eden, in 1913, and the Swede, Hybbinette, in 1932 (Palmer & Widén 1948).

Since 1946 only this method has been employed in the treatment of recurrent anterior dislocation of the shoulder at Sentralsykehuset in Trondheim. In 1961 Lavik published a paper describing 22 cases treated up to 1955. The material presented here concerns patients treated during the following 13-year period. The aim of this investigation has been to find out if the results (with regard to function and incidence of recurrence) are sufficiently good when compared with the results of other operations described.

MATERIAL AND METHODS

During the period 1956–1968 a total of 45 patients were treated for recurrent anterior dislocation of the shoulder. Two were affected bilaterally, the survey thus covering 47 operated shoulders.

In the 47 cases there were 13 female and 34 male shoulders. In 22 cases the right shoulder was affected; the left was affected in 25 cases. The age at which primary dislocation occurred was under 30 years in 30 cases and under 20 years in 16 cases. In as many as 7 cases the age at which the first dislocation occurred was 15 years or below. The youngest was 7 years of age. The average age at primary dislocation was 27 years.

The primary dislocation occurred in 5 cases without significant injury, e.g. swimming, handstanding or hanging by the arms. In many of the other cases it was impossible to determine whether the trauma was significant or not. Thirty patients stated that their primary dislocation was caused by a direct blow to the shoulder. Eight gave a history of a fall on the outstretched arm. In four cases the type of injury was unknown.

One patient waited two days before obtaining medical care, but all the others were treated by prompt closed reduction. Seven patients managed to reduce their first dislocation themselves. Four patients had their shoulders reduced by friends or passers-by, whereas the other 36 had to consult a physician.

In 11 cases the shoulder was not immobilized in any way after reduction; in 9 cases for a week or less, in 16 cases for two weeks or more, and unknown in 9 cases.

The number of dislocations before operation varied from 3 to 35. Many patients, however, described them as numerous or innumerable.

Table 1. The Eden-Hybbinette operation. Interval between primary dislocation and operation. Number of dislocations.

Interval between primary dislocation and operation	No. of dislocations			No. of operated shoulders
	1–5	6–15	>15	
2 years	2	4	1	7
3–4 years	5	9	2	16
5–9 years	2	6	4	12
10–14 years	0	3	3	6
15 years	1	1	4	6
Total	10	23	14	47

There was a hereditary factor in 2 cases. In one case a father and son were affected. In the other case two sisters had dislocations, one bilaterally.

Figure 1. The characteristic posterior capital notch.

Table 2. The Eden-Hybbinette operation. Operative findings.

47 operated shoulders	Ruptured or displaced labrum	Missing labrum	Blunt anterior glenoid margin	Defect of anterior glenoid margin	Ruptured joint capsule	Corpus librum	Rupture of subscap. tendon	Significantly loosened joint capsule
Number of shoulders	18	13	20	2	3	1	1	6

Preoperative X-rays of 45 shoulders exhibited the characteristic posterior capital notch in 26 cases (58 per cent). There were no preoperative X-rays to be found for 2 patients.

Operative technique

Essentially, the exact method described by Palmer & Widén (1948) was used.

In every case the bone transplant was taken from the iliac crest on the opposite side. Postoperatively the arm was bandaged, internally rotated to the thorax. Exercise was begun after 10 days, but external rotation was avoided for the first month.

Except for wound infection in two cases and a wound haematoma in one case, there were no postoperative complications.

Operative findings

Table 2 illustrates the pathological findings during operation. In all but 6 cases there was injury to joint capsule, labrum or bony margin of the glenoid cavity.

The joint capsule was described as slack or widened in 6 cases. These findings are probably of little importance, since the capsule is often found to be markedly slack without the occurrence of dislocation (McLaughlin & MacLellan 1967).

RESULTS

In the follow-up of these cases all 45 patients were sent a questionnaire, and 42 patients (93.6 per cent) replied. One patient had died and two patients were impossible to trace, but one of them had been reoperated, so the necessary particulars could be found in his case history. In addition to the data received through the questionnaire, 41 cases (87.2 per cent) were medically examined; 35 cases by the authors and 6 by colleagues around the country. A total of 35 were X-rayed during the follow-up. The largest group was between 20 and 30 years of age at the time of operation. The follow-up period varied from 2 to 14 years, the average being 6.5.

Table 4 gives the symptoms and findings at the follow-up examination. It is, perhaps, of value to note that none of the four patients who

Table 3. Age distribution, sex ratio and follow-up period.

Age at operation	Sex		Follow-up period (years)						Not able to be traced at follow up	Total
	F	M	12–14	10–12	8–10	6–8	4–6	2–4		
15 years	0	1				1				1
15–20 years	1	2			1		1		1	3
20–30 years	3	12	1		4	2	5	3		15
30–40 years	6	3	3	2		1	2	1		9
40–50 years	0	9		1	4		3	1		9
50–70 years	3	7	1	1	1	3	1	2	1	10
	13	34	5	4	10	7	12	7	2	47

Table 4 .Symptoms and findings at follow-up examination.

Follow-up period (years)	No. of patients	Pain	Limited movement	Arthrosis	Forced change of occupation	No. of redisloc.	Condition of transplant			No X-ray
							In situ	Dislodged	Absorbed	
2	7	1	2	2	0	1	3	1	0	3
3–5	12	1	0	3	0	3	6	2	2	2
6–10	17	2	2	6	1	2	12	1	1	3
11–14	9	0	1	4	0	0	6	1	0	2
	45	4	5	15	1	6	27	5	3	10

complained of pain in the shoulder region belongs to the longest follow-up group in which the incidence of osteoarthritis is highest. Only one af these had daily pain. He is a dock worker and had arthritic pains in his shoulder before operation. The other three patients had symptoms only in connection with their work. No patient complained of diminished power, and during the follow-up examination this was confirmed. Motility of the shoulder was normal, with the exception of 5 cases, in which the external rotation was limited up to 20°. All the examined patients could place their hand at the back of the neck and behind the back.

Only one patient had changed his job because of his shoulder complaint. He was a farmer, and complained of pain in connection with heavy lifting. In the follow-up investigations deformity due to arthrosis

was found in 15 of the 35 X-rayed patients, but 6 of these had shown signs of arthritic changes preoperatively.

In most cases the changes were extremely slight, and only 3 or 4 of these had any symptoms. In 24 of the 35 X-rayed shoulders the transplant was correctly positioned; this represents 44 per cent.

Table 5. Frequency and time of recurrence.

	Operated	Ist redis-location	No. of redis-locations	Reoperated	Redis-location
B.Ø. b.1955	1963	1968	1		
J.B. b.1907	1965	1965	numerous	1967	?
J.K. b.1940	1966	1966	numerous	1969	0
A.G. b.1902	1964	1964	6		
E.A. b.1944	1967	1968	1		
M.H. b.1904	1961	1962	numerous	1965	0

Table 5 gives a more detailed account of the 6 cases in which redislocation occurred. The youngest patient in the survey is represented here. He was 8 years of age at operation. Redislocation occurred 5 years after operation, during a gym. class at school, and his teacher reduced it. He has had only the one recurrence and is otherwise satisfied with the result of the operation. Redislocation for the other 5 patients oc-

Figure 2. X-ray showing the transplant a few weeks after operation.

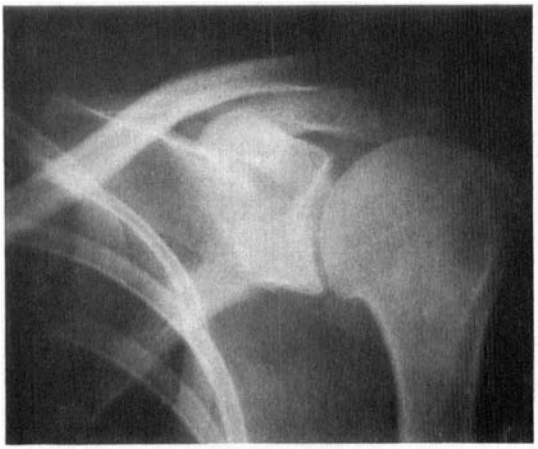

Figure 3. Same patient 9 years postoperatively.

curred within the first year after operation, the shortest interval being two months. Definite injury appears to have been involved in at least three of these redislocations. X-rays showed the transplant correctly positioned in three of the redislocations. In one case the transplant was already dislodged 14 days after operation; in one case the transplant was absorbed; and in another partly absorbed. Only 2 of our 6 patients with redislocation complained of pain in the shoulder.

DISCUSSION

Palmer & Widén (1948) alleged that the object of the Eden-Hybbinette method is to build out the anterior glenoid margin, enabling it to take up or fill out the posterolateral impression on the head of the humerus, and thus hinder so-called intracapsular subluxation.

Åke Jakobsson (1949) maintains that the transplant ought not to protrude further laterally than the intact part of the anterior glenoid margin, the intention being to build out the glenoid margin anteriorly. He therefore no longer employs the smaller limb in the L-formation transplant. He alleges that in doing this one also reduces the danger of postoperative arthrosis.

During their experimental studies, Höhle et al. (1969) claim to have shown that the posterolateral impression on the head of the humerus ("caput-en-hachette") does not come in contact with the anterior glenoid margin, even during forced movements. The basis for the Eden-Hybbinette method would in this case be false.

There has been considerable discussion as to the significance that

injuries to the capsule and labrum can have as aetiological factors in recurrent dislocation of the shoulder.

De Palma (1950) discusses a "neuromuscular imbalance" in connection with recurrent shoulder dislocation. He mentions, amongst other things, the hyperextension of the short rotators, particularly subscapularis in primary dislocation. These muscles do not regain their normal length and tone due to absence of or incorrect treatment (Hindmarsh & Lindberg 1967).

In our survey more than half of the cases (56 per cent) were immobilized for a week or less, after primary dislocation. Only two shoulders were immobilized for more than three weeks. Much of the evidence suggests that some of the recurrent dislocations could have been avoided by longer immobilization after primary dislocation. De Palma suggests immobilization for 8 weeks. In our opinion three weeks would be reasonable.

Many shoulder dislocations will, however, certainly become recurrent, regardless of the length of immobilization time. We found, as did Lavik, that many patients could reduce their own primary dislocation themselves, or with the help of passers-by, but had to consult a physician when further dislocation occurred. This might indicate that in the first instance merely subluxation occurred, which later became complete dislocation.

The average age of the first dislocation was, in our material, 27 years. McLaughlin & MacLellan (1967), in a comparative study, found that almost all recurrent dislocations began before the age of 30, and almost all non-recurrent lesions occurred after the age of 30 years. They concluded that "age seemed to be the essential factor in determining whether or not a primary dislocation was to be followed by recurrent episodes".

In the study of this material we have not fully ascertained the reason for the Eden-Hybbinette method giving such good results. There is, however, much to indicate that capsule shrinkage, "scar formation", can be one of the important factors. In 3 of 6 patients with postoperative redislocation, X-ray checks showed the transplant *in situ*. On the other hand, amongst some of the patients with excellent results, the transplant was absorbed or displaced.

It seems to us that the condition of the transplant is of little consequence as a deciding factor in the recurrence of dislocation, as long as the transplant is not primarily dislodged.

Review of the literature indicates certain deficiencies in all opera-

tions for recurrent dislocation of the shoulder. Function has not always been optimal following the Putti-Platts operation (Adams 1948, Osmond-Clarke 1948). The Bankart operation is difficult, and the good results obtained by Bankart (1938), have not always been duplicated in the hands of other surgeons (Day et al. 1966).

In our series of Eden-Hybbinette operations, functional results have been good, and recurrent dislocation limited to 6.8 per cent, if redislocation after violent re-injury is excluded. Few of our patients had any notable restriction of movement, and all had good muscle power.

The Eden-Hybbinette method is a relatively simple operation, and in our opinion represents a satisfactory treatment of a troublesome complaint.

SUMMARY

During a 13-year period 45 patients with recurrent anterior dislocation of the shoulder have been operated, 2 patients bilaterally, employing the Eden-Hybbinette method. A total of 44 of these 47 shoulders have been followed up, 6½ years being the average follow-up time.

At operation, pathological changes in the anterior part of the humeroscapular joint were found in 41 cases.

Moderate limitation of external rotation was found in 5 cases; none had reduced muscle power. The transplant was *in situ* in 27 of the 35 X-ray examined shoulders. Fifteen had arthritic changes, but 6 of these had arthrosis preoperatively. Six patients suffered redislocation, but in 3 cases this occurred in connection with significant trauma.

There is much to indicate that scar formation is a significant factor in this operative technique. In half of the number of patients with redislocation, the transplant was in fact correctly placed, while it was absorbed or dislodged in several cases, with good results. Investigations also appear to show that incomplete immobilization after primary dislocation can be an additional aetiological factor in recurrent dislocation of the shoulder.

The Eden-Hybbinette operation seems to be a good alternative in the treatment of recurrent anterior dislocation of the shoulder.

REFERENCES

Adams, J. C. (1948) Recurrent dislocation of the shoulder. *J. Bone Jt Surg.* **30-B**, 26.

Bankart, A. S. B. (1938) The pathology and treatment of recurrent dislocation of the shoulder-joint. *Brit. J. Surg.* **26**, 23.

Day, A. J., MacDonnell, J. A. & Pedersen, H. E. (1966) Recurrent dislocation of the shoulder. A comparison of the Bankart and the Magnusson procedures of 16 years. *Clin. Orthop.* **45**, 123.

De Palma, A. F. (1950) *Surgery of the shoulder.* J. B. Lippingcott Co., Philadelphia.

Hindmarsh, J. & Lindberg, A. (1967) Eden-Hybbinette's operation for recurrent dislocation of the humero-scapular joint. *Acta orthop. scand.* **38**, 459.

Höhle, K. D., Willebrand, H. & Clausen, C. (1969) Untersuchung zur Gelenkmechanik bei rezidivierender Schulterluxation vor und nach operativer Behandlung. *Mschr. Unfallheilk.* **72**, 205.

Jakobsson, A. (1949) On recurrent dislocation of the shoulder-joint. *Acta orthop. scand.* **18**, 284.

Lavik, K. (1961) Habitual shoulder luxation. *Acta orthop. scand.* **30**, 251.

McLaughlin, H. L. & MacLellan, D. J. (1967) Recurrent anterior dislocation of the shoulder: II. A comparative study. *J. Trauma* **7**, 191.

Osmond-Clarke, H. (1948) Habitual dislocation of the shoulder. *J. Bone Jt Surg.* **30**-B, 19.

Palmer, J. & Widén, A. (1948) The bone block method for recurrent dislocation of the shoulder-joint. *J. Bone Jt Surg.* **30**-B, 53.

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