



Surgical treatment of acute and chronic acromioclavicular dislocation Tossy type III and V using the Hook Plate

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We treated 16 patients with acute and chronic acromioclavicular dislocations type III and V by open reduction and fixation using a Hook plate (AO). Plate removal was performed 7 months later on average (range 3½ - 13). A clinical and radiological follow-up was performed after a mean time interval of 29 months (range, 11-40) from the date of plate removal. The L'Insalata scoring system was used to compare the function of the injured shoulder before operation and after removal of the hook plate. Constant's score was used to evaluate the operated shoulder after the removal of the hook plate. Complications were limited and the overall results were excellent.

Keywords : acromioclavicular dislocation ; hook plate.

INTRODUCTION

There are still diverging opinions regarding the treatment of acute acromioclavicular dislocations (6,9,12). Several different methods of surgical treatment, some of them technically demanding, have been evaluated, and the results are not uniformly good (1,3-6,10,12). Because there is a tendency to treat these lesions conservatively, we also encounter patients with functional impairment and pain due to chronic dislocations. The aim of the study was to evaluate the outcome of surgical treatment of acute and chronic acromioclavicular dislocations Tossy type III and V using acromioclavicular ligament reconstruction and fixation with

a Hook Plate, without coracoclavicular ligament reconstruction.

PATIENTS AND METHOD

In the period 1999 – 2003, we used the Hook plate for fixation of isolated acromioclavicular dislocations in 16 patients. All were males, with an average age of 38 years (range, 21-56). None of the patients had a history of previous injuries to the affected shoulder. Thirteen patients had a physically demanding occupation, 2 patients had office work and one did not work. The mechanism of injury was direct in 13 patients and indirect in two patients. One patient could not describe the injury mechanism. The dominant arm was injured in 8 patients.

Thirteen patients had type III dislocations (fig 1) and three were diagnosed as type V dislocations. Six patients were operated within 4 weeks following injury, while 10 patients underwent delayed operations after a mean period of 59 weeks (range, 23-158) after injury. The

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Fig. 1. — Preoperative radiograph showing acromioclavicular joint dislocation type III (case nr. 3 in the table).



Fig. 2. — Postoperative radiograph of the same patient showing reposition of the acromioclavicular joint and fixation with a hook plate.

operation was performed in a beach chair position ; through a transverse skin incision following the lateral third of the clavicle, a muscular split was done and the lateral part of the clavicle, the medial part of the acromion and the acromioclavicular joint (in some cases) were exposed. All or part of the meniscus was removed if it was injured, and osteophytes were removed if present. The dislocated acromioclavicular joint was reduced and fixed using a hook plate with appropriate offset (15-18 mm) (fig 2). The articular capsule including the acromioclavicular ligaments were reconstructed and sutured with zero Dexon suture material. No coracoclavicular ligament reconstruction was attempted.

The mean hospital stay was 2 days. The arm was immobilized in a sling for 1-2 weeks. Passive and active shoulder motion was encouraged as soon as the pain level allowed, and all patients were offered physiotherapy for 5 weeks.

All patients had the hook plate removed (fig 3) after a mean period of 7 months (range, 3½-13). The hook plate removal was done as a one-day surgery.



Fig. 3. — Radiograph of the same patient showing sustained reposition of the acromioclavicular joint 31 months after hook plate removal.

The mean follow-up period was 29 months (range, 11-40) following plate removal. The evaluations described by L'Insalata *et al.* in 1997 (7) and Constant and Murley in 1987 (2) were used to evaluate the operated shoulder of the 16 patients (table I). Mann Whitney test was used to measure the statistical differences.

RESULTS

L'Insalata and Constant scores at follow-up showed that the overall assessment was satisfying. The mean L'Insalata score was 2.1 preoperatively and 8.6 at the time of evaluation, and the mean Constant score at evaluation time was 95. L'Insalata scores pre- and postoperatively showed a marked improvement in the general as well as the specific domains (fig 4). There were no statistical differences between the results of acute and late operations (table I/E). Age did not affect the operative results. Patients older than 40 years improved with no significant difference compared to patients younger than 40 years.

All patients had some degree of pain or discomfort with the hook plate in place and 38% (6 patients) had impaired abduction (table I). These signs and symptoms were relieved on removal of the plate.

One patient had superficial wound infection treated with relevant antibiotics (table I – patient nr. 2).

In two patients a subluxation of the clavicle was present after removal of the plate. This did not

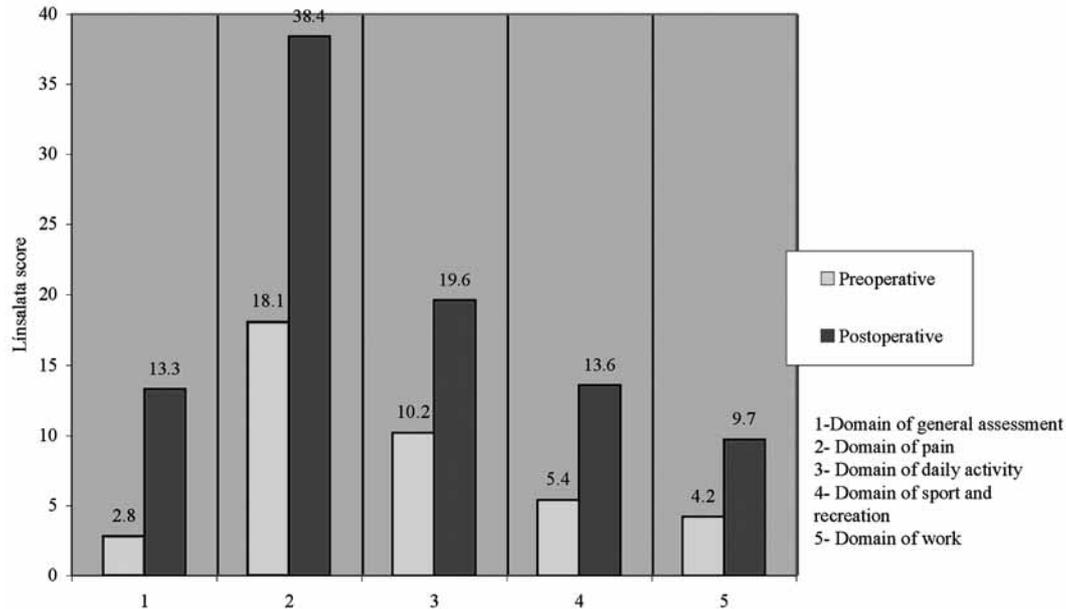


Fig. 4. — Detailed L'Insalata score of the injured shoulders in 16 patients with AC joint dislocations (Tossy III and V) before and after surgical treatment with the Hook Plate.

affect the outcome (L'Insalata 86 and 96, Constant 93 and 93 subsequently) (table I – patients nr. 6 and 12).

One patient had a displacement of the hook plate superiorly while he was doing pushups 3½ months postoperatively. The plate was immediately removed and the patient thereafter did well, scoring 89 and 100 (table I, patient nr. 8).

DISCUSSION

Many types of operative procedures have been used to treat acromioclavicular dislocations, and the results have varied (1,3-6,10,12). We have tried to use a relatively simple method to restore the biomechanics of the shoulder girdle, and the results appear satisfying compared with other procedures.

Some controversy still exists regarding treatment options. The problem seems to be to select the patients for primary operation and we still see patients with untreated type V lesions. This

material shows that it is safe to treat even chronic lesions and it seems as if the results are comparable to those acutely treated.

Some authors did not find it necessary to remove the implant (3). We think that this is crucial to regain full range of motion and avoid residual pain. Clavicular fracture at the medial end of the retained implant following a low-energy fall has been reported in the literature (8). Impairment of shoulder movement has also been reported following other types of operations, due to metal devices used to fix the acromioclavicular joint (6).

Sim *et al* in 1995 (11) previously reported dislocation of the Hook Plate. We had one case of dislocation precipitated by a combination of poor placement of the hook and too aggressive rehabilitation. It is important that the hook is placed in its full length inferior to acromion. In some patients with minor lateral fractures or avulsions or slight osteolysis, the acromioclavicular gap can be widened thereby creating a risk of placing the hook too far medially.

Table I. — 16 cases of acute and chronic Tossy III and V acromioclavicular dislocations and results of operative treatment with Hook Plate

A	B	C	D	E	F	G	H	I	J	K	L	M
1	46	III	Pain and discomfort	4	None	Full ROM without discomfort	8	None	33	43	97	99
2	21	III	Pain	54	Superficial skin infection	Limited abduction to 120°	6	None	23	22	100	96
3	24	III	Pain and discomfort	3	None	Full ROM without discomfort	7	None	29	42	91	95
4	56	III	Weak shoulder	74	None	Limited abduction to 160°	5	None	30	27	96	100
5	42	III	Pain and discomfort	3	None	Pain at full abduction	6	None	25	48	98	92
6	36	III	Pain	158	None	Limited abduction to 120°	7	Displacement of the lat. end of the clavicle	20	44	86	93
7	36	III	Pain and discomfort	3	None	Pain at full abduction	6	None	15	27	100	100
8	41	III	Weak shoulder	24	Hook plate lat. dislocation	Limited abduction to 120°	3 1/2	None	13	39	89	100
9	44	III	Pain and discomfort	3	None	Pain at full abduction	6	None	11	27	100	100
10	50	V	Pain and discomfort	3	None	Limited abduction to 120°	6	None	40	63	97	93
11	51	V	Pain	27	None	Pain at full abduction	6	None	36	56	97	96
12	30	V	Pain	54	None	Limited abduction to 160°	13	Displacement of the lat. end of the clavicle	39	58	96	93
13	32	III	Weak shoulder	29	None	Pain at full abduction	9	None	38	42	95	84
14	35	III	Pain	75	None	Full ROM without discomfort	12	None	39	57	95	86
15	28	III	Weak shoulder	23	None	Full ROM without discomfort	5	None	37	33	81	100
16	33	III	Pain	75	None	Full ROM without discomfort	6	None	40	41	93	95

A : Patients
 B : Age (years)
 C : Grade of injury
 D : Indication for operation
 E : Weeks from injury to surgery
 F : Complications
 G : ROM before removal of Hook Plate
 H : Months of joint fixation with hook plate.
 I : Complications after plate removal
 J : Follow up time/ months
 K : Preoperative L'Insalata score
 L : Postoperative L'Insalata score
 M : Postoperative Constant score

The overall results indicate that this procedure is safe and relatively simple. It can be offered to patients with acute as well as chronic dislocations.

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