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
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.

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
One patient had a displacement of the hook plate superiorly while he was doing pushups 3 1/2 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

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
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<td>III</td>
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<td>4</td>
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<td>Full ROM without discomfort</td>
<td>8</td>
<td>None</td>
<td>33</td>
<td>43</td>
<td>97</td>
<td>99</td>
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<td>21</td>
<td>III</td>
<td>Pain</td>
<td>54</td>
<td>Superficial skin infection</td>
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<td>3</td>
<td>24</td>
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<td>Full ROM without discomfort</td>
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<td>None</td>
<td>29</td>
<td>42</td>
<td>91</td>
<td>95</td>
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<td>4</td>
<td>56</td>
<td>III</td>
<td>Weak shoulder</td>
<td>74</td>
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<td>Limited abduction to 160°</td>
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<td>None</td>
<td>30</td>
<td>27</td>
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<td>42</td>
<td>III</td>
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<tr>
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<td>Limited abduction to 120°</td>
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<td>Displacement of the lat. end of the clavicle</td>
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<td>86</td>
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</tr>
<tr>
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<td>Pain at full abduction</td>
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<td>96</td>
</tr>
<tr>
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<td>V</td>
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<tr>
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<td>28</td>
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<td>Weak shoulder</td>
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<td>None</td>
<td>Full ROM without discomfort</td>
<td>6</td>
<td>None</td>
<td>40</td>
<td>41</td>
<td>93</td>
<td>95</td>
</tr>
</tbody>
</table>

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.

REFERENCES


