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A COMPARISON BETWEEN CONSERVATIVE AND OPERATIVE TREATMENT OF ACUTE ACROMIOCLAVICULAR DISLOCATION

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The extensive literature on acute dislocation of the acromioclavicular joint has not so far resulted in a unanimous attitude toward the treatment of this trauma. Urist (1959) compiled a list of approximately 50 different methods of bandaging and 30 different operative procedures, each having its enthusiastic supporters. However, no direct comparisons appear to have been made between two or more of these methods of treatment. In Department T at the Copenhagen County Hospital Gentofte we have, therefore, for a period of 18 months, treated all acute acromioclavicular dislocations operatively applying the highly recommended Bosworth Fixation (Bosworth 1941) in a modified form (Kennedy & Cameron 1954, Weitzmann 1967, Reideberger et al. 1970). The results of this treatment are compared with those of conservative treatment in another patient material.

Knowledge of the normal anatomy of the acromioclavicular joint and the clinical symptoms of dislocation of this joint is taken for granted. The final diagnosis is established by radiological examination of the dislocated as well as the uninjured shoulder, exposures being taken without traction as well as with 10 kilograms traction to unsupported arms (Meyers 1968, Moseley 1959). Dislocation of the joint is present when the traction exposure shows the lateral end of the clavicle to be displaced at least one width of the bone above the acromion. In rare cases dislocation of the joint involves a distal displacement of the clavicle, its lateral end then appearing below the acromion—no such case occurs in our material. Subluxation is defined radiologically as an increase in the diastasis between the articular surfaces of the injured joint as compared with the uninjured if, on the application of

traction, the diastasis is seen to increase further without a complete lack of contact between the articular surfaces ensuing.

METHOD

A total of 24 patients, in whom the diagnosis acute acromioclavicular dislocation had been established previously, have been followed-up by the authors.

The investigations included radiological and physical examinations as well as anamnestic information concerning the period of illness, the working conditions, and the subjective symptoms.

The patients treated conservatively were followed-up at 26 to 124 months, mean: 84 months, after the occurrence of the injury, while the patients treated operatively were followed-up at 6 to 19 months, mean: 12.25 months, after the injury.

MATERIAL

The material comprises two groups of patients:

One is made up of those patients who during the period 1st January, 1961 to 1st January, 1971 were admitted to the Copenhagen County Hospital Gentofte with acute acromioclavicular dislocation, primarily excluding all patients with additional fractures of the clavicle or the scapula. Twenty-three patients were included in this group, 7 of whom were excluded as not fulfilling the criteria laid down, as well as 3 who could not be traced. This left 13 patients, 1 woman and 12 men, from 24 to 73 years old(mean:41.5 years, 3 patients being older than 50 years) all having received conservative treatment. Seven of these patients had had bandages applied for 2 to 4 weeks, either according to the method of Watson-Jones or Madsen's figure-of-eight bandage; two patients had received physiotherapy only for 2 to 4 weeks, and 4 patients had not received any kind of treatment.

The second group is made up of the patients who, during the period 1st November, 1970 to 1st February, 1972, were admitted to the Copenhagen County Hospital Gentofte, Department T with the same diagnosis. Eleven patients were included in this group with ages ranging from 18 to 61 years (mean: 37 years, 3 patients being older than 50 years). There were 3 women and 8 men. These patients were all operated upon at the latest on the fifth day after the injury. The surgical procedure consisted of open reposition of the acromioclavicular joint with removal of any interposed tissue followed by fixation of the clavicle to the coracoid process of the scapula by means of an AO-screw. Postoperatively the shoulder was supported by a mitella for 2 to 4 weeks. The screw was removed on an average 10 weeks later. In both groups highly different occupations were represented, and both groups included patients doing heavy physical work involving the lifting of heavy goods and long hours of work with the arms extended above the shoulders.

RESULTS

In the investigation we have distinguished between the functional and the radiological results which appear in Tables 1 and 2.

Table 1. A comparison between the functional results of operative and conservative treatment of acute acromioclavicular dislocation.

	Good	Fair	Poor	Total
operative treatment	5	4	2	11
conservative treatment	7	5*	1	13

* In one patient the symptoms were localized in the glenohumeral joint rather than the acromioclavicular joint. This patient suffered from degenerative arthritis in several of the other joints.

For the functional results we have used the terms good, fair, and poor defined in the following manner:

Good: No pain, or only rare, short-lasting attacks of pain in connection with certain movements; normal mobility; normal strength; possibly slight cosmetic complaints.

Fair: Pains in connection with certain movements, and/or slight impediment of movement, and/or slightly reduced strength in certain muscular groups; possibly cosmetic complaints. However, none of these complaints were sufficiently serious to necessitate a change in occupation.

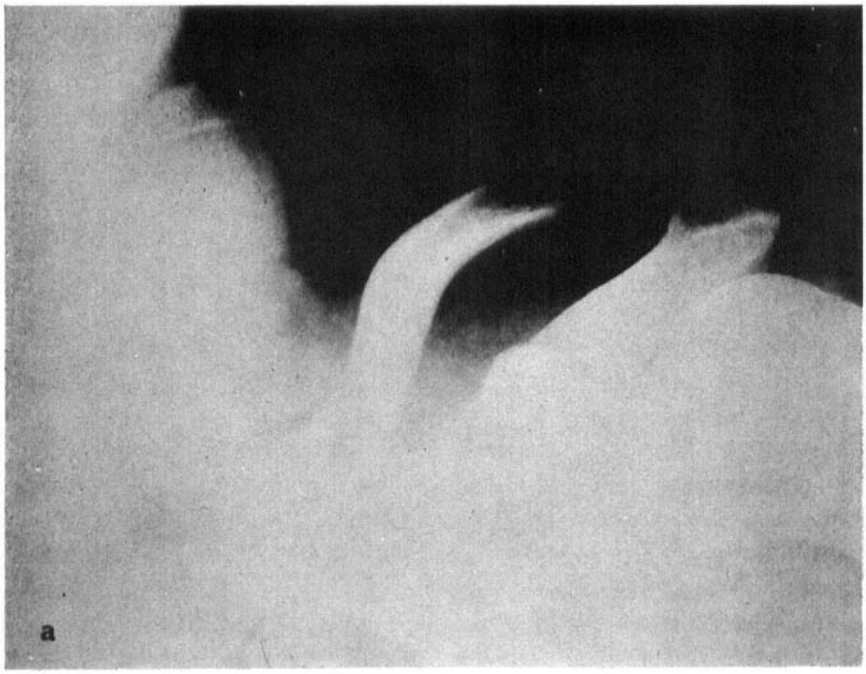
Poor: Pains daily, and/or distinctly impeded mobility, and/or distinctly reduced strength. Complaints so serious as to necessitate change in occupation.

The major complaint in connection with the poor functional results in patients treated operatively as well as in those treated conservatively was pain. Objectively all the patients showed normal strength of the entire upper extremity on exposure to a heavy load for a short time, but few claimed a more rapid tiredness of the arm in question during heavy work of long duration. The reduction in mobility was likewise moderate, frequently involving only specific movements and being within 5 to

Table 2. A comparison between the radiological results following operations and conservative treatment of acute acromioclavicular dislocation.

	Reduced dislocation	Persisting subluxation	Persisting dislocation	Total
operative treatment	3	5	3	11
conservative treatment*	3	3	5	11

* Two of these patients were not examined radiologically.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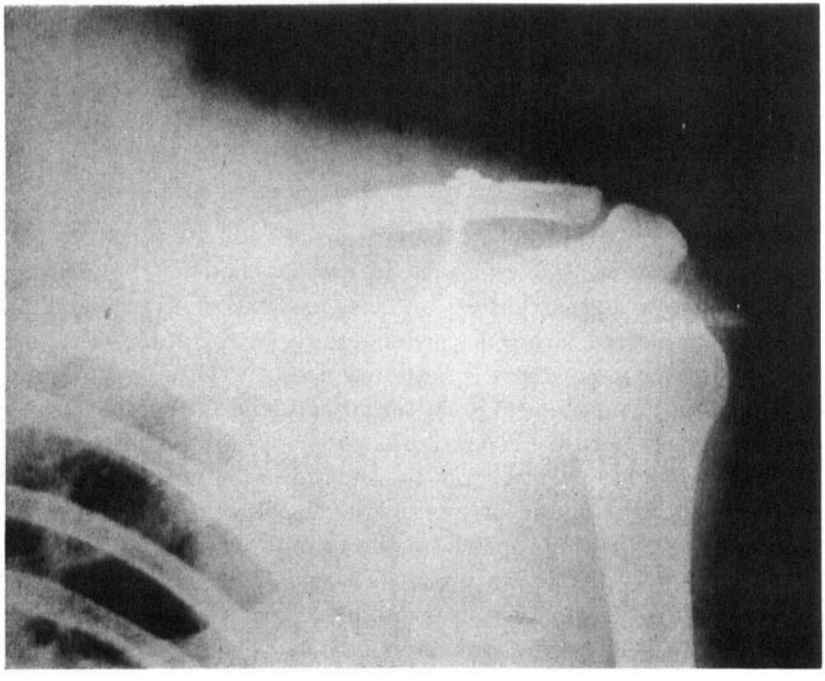

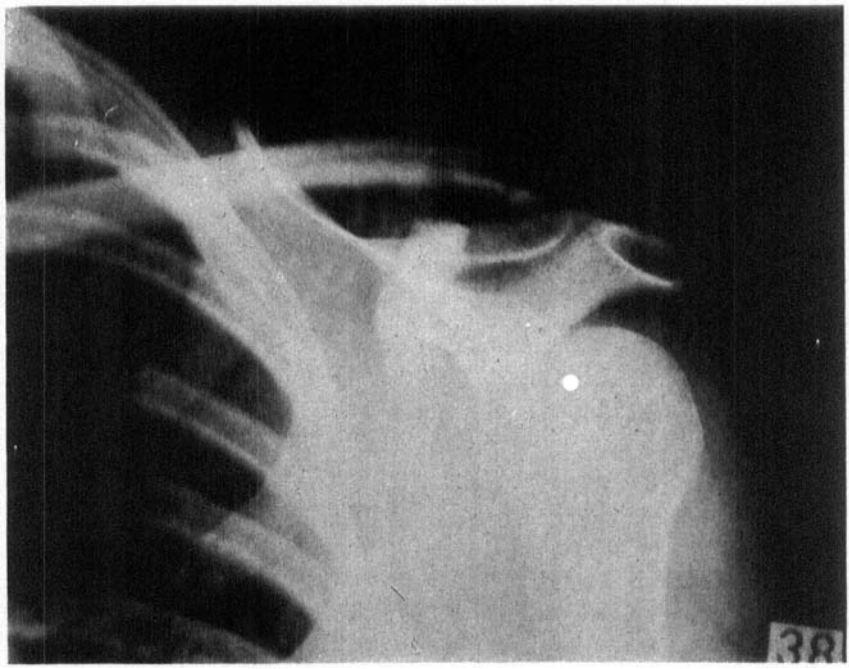

Figure 1. The radiological results of one case of acute acromioclavicular dislocation treated operatively by a modified Bosworth method.
A. The acute phase of the acromioclavicular dislocation.
B. The postoperative result.
C. The follow-up result 9 months after removal of the coracoclavicular screw, 12 months after the trauma.
All pictures are taken with 10 kg traction to each arm.

15°. In only 2 patients the movements were reduced by 30 to 35° on flexion or abduction. In one patient the result was deemed poor, mainly due to persisting paraesthesies, impeded control of movement, and a sensation of reduced strength corresponding to the 3 ulnar fingers of the hand in question; these symptoms arose in connection with the operation. Another patient had suffered from similar symptoms during the first 2 postoperative weeks, but these symptoms had later disappeared completely. Apart from these complaints no complications in connection with the operations were registered.

Among the 12 patients in whom the results were described as good 6 held jobs entailing heavy physical work—2 of these patients had been treated operatively, 4 conservatively.

The radiological results are described as: 1) Reduced dislocation,

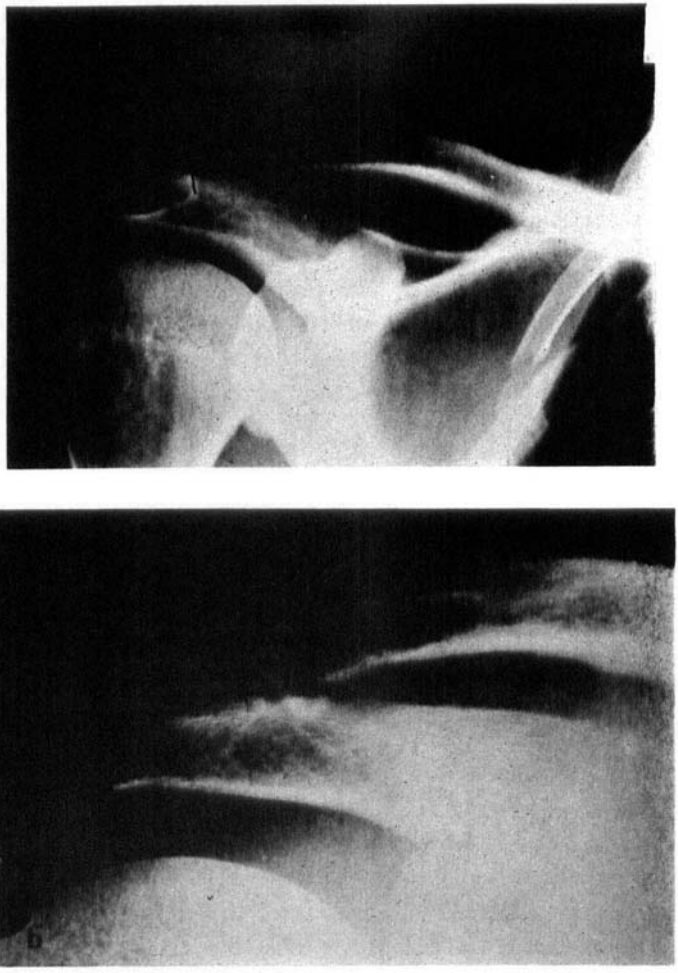

Figure 2. The radiological results of one case of acute acromioclavicular dislocation treated conservatively.
A. The acute phase of the acromioclavicular dislocation.
B. The follow-up result 110 months after the trauma.
All pictures are taken with 10 kg traction to each arm.

2) persisting subluxation, and 3) persisting dislocation. Any sign of calcification or arthrosis was also noted.

Radiologically we received the impression—when comparing the primary exposures with those of the present study—that in the majority of the patients operated the dislocation was completely reduced postoperatively, while this occurred in only few conservatively treated

patients during the period in which they wore bandages. At the time of the follow-up the situation had changed: In the operated patients the clavicle was often found to be displaced proximally after the removal of the osteosynthetic material, while at the same time pronounced calcifications had developed around the joint, especially corresponding to the coracoclavicular ligament (Figure 1 A, B, C). In the patients treated conservatively the lateral end of the clavicle had gradually changed and bent downwards, while at the same time the direction of the articular surfaces had changed, the surfaces formerly vertical now slanting, those formerly slanting now almost horizontal; in this manner the extent of the dislocation had decreased and in some cases been reduced completely. In this group calcifications were considerably less pronounced (Figure 2 A, B).

In contradistinction to some authors (Weitzmann 1967) we have not found complete correspondence between the functional and the radiological results as is apparent from Table 3. Thus we found 2 cases showing a good functional result despite persisting dislocation, and one case in which the results were poor although the persisting subluxation was very slight. The calcifications mentioned did not appear to have any relationship to the functional result, severe calcifications occurring in 2 patients in whom the result was good.

Apart from the radiological and the clinical results, the length of the period in which the patients were incapacitated for work was registered for all patients (Table 4). The fact that the length of this period was 1½ times longer for the operated patients than for those treated conservatively was due mainly to the considerably reduced mobility during the period in which the clavicle was fixed to the coracoid process. Only after the removal of the screw was it possible to commence an effective

Table 3. A comparison between the functional and the radiological results after acute acromioclavicular dislocation.

Functional results	Radiological results			Total
	Reduced dislocation	Persisting subluxation	Persisting dislocation	
good	5	4	2	11
fair	1	3	4	8
poor	0	1	2	3
	6	8	8	22*

* The two patients who were not examined radiologically are excluded.

Table 4. A comparison between the length of the period of illness in patients treated operatively and conservatively, respectively, for acute acromioclavicular dislocation.

	Operatively treated	Conservatively treated
No. of days treated in hospital or by GP	9 to 18 days mean: 11 days	3 to 9 days mean: 5½ days
No. of weeks unfit for work	5 to 14 weeks mean: 9 weeks	2 to 13 weeks mean: 6 weeks
Total number of weeks between injury and present state	5 to 23 weeks mean: 12½ weeks	3 to 25 weeks mean: 10 weeks

rehabilitation of the joint. This was of special importance to patients having a physically heavy job.

DISCUSSION AND CONCLUSION

The most enthusiastic supporters of operative treatment, (according to Bosworth's method) for acute acromioclavicular dislocation are Kennedy & Cameron (1954), who prefer a rigid fixation of the clavicle to the scapula thus immobilizing the acromioclavicular joint. They claim that the total mobility of the shoulder is maintained because rehabilitation makes possible a synchronic function of the two bones. The experience gained from our material of operated patients shows the opposite result, as almost all patients, despite physiotherapy, suffered from a severely reduced mobility of the injured shoulder during the period in which the clavicle was fixed by means of a screw. Other authors (Bosworth 1941, Weitzmann 1967, Riedelberger et al. 1971) recommend the method used by us as being the only durable form of internal fixation as cerclage sutures and Kirschner wires are often seen to break, silk sutures to snap, and ligament plastics, possibly with fascial transplants, to stretch, if the operation is not supplemented with external bandaging (Moseley 1959, Stewart 1963). All supporters of operative treatment of this injury hold the anatomical result to be most satisfactory after operation, and maintain that a certain instability of the shoulder almost always persists following conservative treatment (Neviaser 1952, Meyers 1968 as well as the aforementioned authors). Such shortcomings of the conservative treatment are not at all evident in our material. Neither subjectively nor objectively did the previous dislocation have any cosmetic sequelae, except in the group operated upon in which one woman was dissatisfied with the scar. As

far as instability of the shoulder is concerned no such condition could be demonstrated objectively, and 7 out of 9 conservatively treated patients doing physically heavy work found the strength in the previously injured shoulder absolutely comparable to that of the other shoulder. The satisfactory results of conservative treatment corroborate the findings of Urist (1946, 1959).

No arthrosis or other late complications from the earlier injury were found in the patients treated conservatively, despite the long observation period. The period of observation for the patients treated operatively was considerably shorter but there are no grounds for assuming that a longer observation period would have shown better results for this group, as all the patients had reached *status quo* several months before the time of this investigation.

The conclusion of our study is that conservative treatment of acute acromioclavicular dislocation irrespective of the method of treatment does not afford less satisfactory functional results than those afforded by operation a.m. Bosworth. Conservative treatment also results in a smaller number of days lost through illness, fewer visits to the general practitioner, fewer days spent in hospital, and the patients are spared the inconvenience of two operations under general anaesthesia. Which of the many conservative methods of treatment should be preferred is not quite clear, but the relatively light and short-lasting bandaging used in this study seems quite sufficient, a fact which has already been demonstrated in previous publications (Stadil 1967).

SUMMARY

The authors have carried out a follow-up of 24 patients with a previous acute acromioclavicular dislocation. Thirteen of these patients had received different kinds of conservative treatment. Eleven had been treated operatively with fixation a.m. Bosworth. No significant difference between the functional and the radiological results of the two groups could be demonstrated, but the restitution was more rapid following conservative treatment which is therefore recommended. At the same time it was found that no definite relationship between the functional and the radiological late results could be demonstrated.

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