THE SURGICAL TREATMENT OF ACROMIOCLAVICULAR DISLOCATIONS

B. A. ROPER, B. LEVACK

From the Department of Orthopaedic and Traumatic Surgery, The London Hospital, London

Fifteen cases of Grade III acromioclavicular dislocations treated by open reduction and internal fixation and followed up for an average of two and a half years are described. The results in terms of movement, relief of pain, functional ability and cosmesis are good.

The treatment of acromioclavicular dislocation in the United Kingdom is usually conservative, using a splint, a bandage and analgesics (Copeland and Kessel 1980). Watson-Jones thought that in young sportsmen with severe injuries this approach might not be justified (Wilson 1976). Severe injuries are classified as Grade III (Allman 1967) and are usually the result of a strong force which has ruptured the acromioclavicular and the coracoclavicular ligaments, with dislocation of the joint. This is in contradistinction to Grade II injuries which are the consequence of a more moderate force with rupture of the capsule and the acromioclavicular ligament; the coracoclavicular ligament is intact but the joint is subluxated. Grade I injuries are the result of mild force with involvement of but few fibres of the acromioclavicular ligament and capsule.

Several studies have shown that Grade III injuries treated conservatively fare badly in terms of pain and decreased function, especially in sportsmen. A study of the literature in 1954 (Kennedy and Cameron 1954) showed that 20 per cent of Grade III acromioclavicular dislocations treated conservatively had unsatisfactory results, with pain, instability and residual loss of shoulder movement. Dawe (1980), reviewing 17 Grade III acromioclavicular dislocations between 9 and 30 months, noted that in 13 there was residual pain during vigorous activity which was sufficiently severe to cause three to change jobs and five to give up contact sports. The case against conservative treatment is not clear. For instance, Urist (1946) claimed an 80 per cent success rate with conservative treatment. Jacobs and Wade (1966), reviewing 17 acromioclavicular dislocations treated conservatively, noted that 53 per cent were asymptomatic but 23 per cent had a decreased range of movement.

Several recent papers have reviewed the results of open reduction and internal fixation. Alldredge (1965) reviewed the results in 24 patients, of which 20 were

excellent, two good and two fair. Weaver and Dunn (1972) commented upon the difficulty of maintaining conservative treatment due to the need for frequent attendances for changes of plaster, problems with the skin, residual deformity and a stiff shoulder, especially in older patients. Of the 15 patients they treated surgically, 12 were operated upon primarily and in three the operation was delayed: all but one of these obtained either a good or a fair result. Powers and Bach (1974) reviewing 14 cases of Grade III acromioclavicular dislocations treated surgically, noted nine good results and two fair but there had been three poor results. Imatani, Hanlon and Cady (1975) reviewed 23 acromioclavicular dislocations in a prospective study: of 11 treated surgically, four had an excellent result, one was satisfactory, one fair but five were poor. It is to be noted, however, that in the surgical technique they used, the ruptured ligaments were not repaired, the joint was fixed with pins and the meniscus excised.

On considering these results, we felt that the place of surgery was still unclear. One of us (BAR) was of the opinion that a Grade III injury in a young person treated conservatively resulted in disabling residual symptoms sufficient to prevent contact sport. Accordingly, all such injuries in these patients have been treated surgically in this hospital and the results are reviewed.

METHODS AND MATERIALS

All patients who attended this hospital in the last five years with clinical and radiographically proven Allman Grade III acromioclavicular dislocations underwent open reduction and internal fixation. The results were reviewed between one and a half and six years later (an average follow-up of two and a half years) and the patients were assessed on the basis of cosmesis, functional ability, relief of pain, localised tenderness and range of movement at the shoulder.

B. A. Roper, MA, FRCS, Consultant Orthopaedic Surgeon

B. Levack, FRCS, Senior Orthopaedic Registrar

Department of Orthopaedic and Traumatic Surgery, The London Hospital, Whitechapel, London E1 1BB, England.

Requests for reprints should be sent to Mr B. A. Roper.

© 1982 British Editorial Society of Bone and Joint Surgery 0301-620X/82/5116-0597 \$2.00

Fig. 1

Radiograph six years after surgical treatment showing extra-articular calcification about the coracoid.

RESULTS

Fifteen patients, all men, were available for review. The age range was 16 to 57 years with an average of 28. There were 12 right acromioclavicular dislocations, and three left. The mechanism of injury was varied: six patients had been involved in road traffic accidents, one had had a fall, two had sustained injuries at judo, three had been involved in rugby and three in association football. In all 15 patients reviewed, the conoid and trapezoid ligaments were torn, the meniscus was torn and the acromioclavicular joint totally disrupted. The time between injury and operation ranged from one day to two weeks with an average of 10 days.

Surgical treatment. This was the same in 12 patients: the meniscus was excised, the joint was stabilised with two Kessel pins after reduction and the ligaments were repaired by suturing the proximal end of the ligaments to the under surface of the clavicle by passing silk sutures through drill holes in the clavicle. In one patient the

ligaments were repaired using a Dacron graft, and in two using a modified Bosworth technique (Bosworth 1941) with a cancellous screw fixing the clavicle to the coracoid process after excision of the meniscus and reduction of the acromioclavicular joint. The arm was totally immobilised for four weeks, then mobilised with physiotherapy, and two weeks later the pins or screws were removed, usually under general anaesthesia.

Assessment. All patients were satisfied with the cosmetic appearance of the shoulder, in that the scar was felt not to be disfiguring and the acromioclavicular joint was not unduly prominent. On specific questioning, all patients denied pain and discomfort in the shoulder both at rest and during strenuous activity. All patients had returned to full activity with the shoulder being used for hard physical work or playing competitive games, with no subjective decrease in its performance in comparison with the non-operated side.

Active and passive movements at the glenohumeral and scapulothoracic joints in the operated shoulder were compared with those of the unoperated side and no significant difference was detected. Similarly, the strength of abduction, adduction, flexion, extension and medial and lateral rotation both in abduction and adduction, were compared and no significant difference was detected between the two sides. In all cases, scapular rhythm was normal and no palpable crepitus could be elicited.

Two of the patients were seen at three and six years respectively after operation. In each case, there were no signs or symptoms suggestive of degenerative disease at the acromioclavicular joint. Radiographs of a patient at six years (Fig. 1) show the acromioclavicular joint in normal alignment with no loss of joint space, no osteophyte formation, no subarticular sclerosis and no cysts. There is, however, some extra-articular calcification about the coracoid as a consequence of the avulsion of the conoid and trapezoid ligaments.

Fig. 2

Fig. 3

Case 1. Figure 2—Radiograph showing complete dislocation of the left acromioclavicular joint. Figure 3—Radiograph after operation showing satisfactory reduction.

Fig. 4

Fig. 5

Case 2. Figure 4—Radiograph of the right shoulder showing a dislocation of the acromioclavicular joint. Figure 5—Radiograph showing the pins fixing the clavicle to the acromion.

ILLUSTRATIVE CASE REPORTS

Case 1. A 32-year-old man injured his left shoulder playing rugby. He was unable to continue playing and complained of severe pain especially over the tip of the acromion. Radiography (Fig. 2) confirmed the presence of a complete dislocation of the acromioclavicular joint. He was initially treated in a sling and subsequently admitted 10 days later for repair. The acromioclavicular joint was initially explored through a curved incision in the line of the deltopectoral groove. The acromioclavicular joint had been dislocated. The meniscus had been torn along with the capsule, and both conoid and trapezoid ligaments were ruptured. The acromioclavicular joint was reduced and held reduced with a cancellous screw through the clavicle into the coracoid. The ligaments were repaired with a silk suture through a drill hole in the clavicle. Radiography (Fig. 3) confirmed satisfactory reduction. At four weeks the patient was mobilised with physiotherapy, and at six weeks the screw was removed. At review three years later there was a full painless range of movement with no functional deficit. He was playing squash regularly.

Case 2. A 25-year-old teacher was involved in a road traffic accident in which he sustained a head injury, fracturing the frontal bone, and a dislocation of the right acromioclavicular joint (Fig. 4). Four days later the acromioclavicular joint was explored through an incision in the line of the deltopectoral groove. The joint was found to be disrupted with rupture of the conoid and trapezoid ligaments from the inferior aspect of the clavicle. The meniscus was excised and the ligaments repaired by

suturing them to the clavicle using silk passed through two holes drilled in the clavicle. The clavicle was fixed to the acromion with two threaded pins (Fig. 5). The patient was immobilised for four weeks and then mobilised with physiotherapy. The pins were removed after six weeks. At review six years later he was completely asymptomatic with a full range of painless movement at the shoulder, sufficient to allow him to play rugby.

DISCUSSION

The acromioclavicular joint is relatively small and is rarely a primary cause of symptoms. Reviewing the literature, it seems that it usually only becomes symptomatic after traumatic dislocation or subluxation. Even then, unreduced or malreduced acromioclavicular joints, though cosmetically unattractive, are only a cause of symptoms in the relatively young patient engaged in active occupations. Restoration and fixation of the normal anatomy in the acute phase in the young adult seems to result in a return to full asymptomatic function. It appears, therefore, that a more vigorous surgical approach to the problem is indicated in young manual workers and in sportsmen.

REFERENCES

- Allredge RH. Surgical treatment of acromioclavicular dislocations. *J Bone Joint Surg [Am]* 1965;47-A:1278.
- Allman FL Jr. Fractures and ligamentous injuries of the clavicle on its articulation. *J Bone Joint Surg [Am]* 1967;49-A:774-84.
- Bosworth BM. Acromioclavicular separation: a new method of repair. *Surg Gynecol Obstet* 1941;73:866-71.
- Copeland S, Kessel L. Disruption of the acromioclavicular joint: surgical anatomy and biological reconstruction. *Injury* 1980;11:208-14.
- Dawe CL. Acromioclavicular joint injuries. *J Bone Joint Surg [Br]* 1980;62-B:269.
- Imatani RJ, Hanlon JJ, Cady GW. Acute, complete acromioclavicular separation. *J Bone Joint Surg [Am]* 1975;57-A:328-32.
- Jacobs B, Wade PA. Acromioclavicular-joint injury: an end-result study. *J Bone Joint Surg [Am]* 1966;48-A:475-86.
- Kennedy JC, Cameron H. Complete dislocation of the acromio-clavicular joint. *J Bone Joint Surg [Br]* 1954;36-B:202-8.
- Powers JA, Bach PJ. Acromioclavicular separations: closed and open treatment. *Clin Orthop* 1974;104:213-23.
- Urist MR. Complete dislocation of the acromioclavicular joint: the nature of the traumatic lesion and effective methods of treatment with analysis of forty-one cases. *J Bone Joint Surg* 1946;28:813-37.
- Wilson JN, ed. *Watson-Jones Fractures and joint injuries*. 5th ed. Edinburgh, London and New York: Churchill Livingstone, 1976.
- Weaver JK, Dunn HK. Treatment of acromioclavicular injuries, especially complete acromioclavicular separation. *J Bone Joint Surg [Am]* 1972;54-A:1187-94.