

Research papers

Fractured clavicle in adults: do all patients need follow up?

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ABSTRACT

Introduction Most patients with mid-shaft and medial third fracture of the clavicle are treated non-operatively. They also have a low incidence of complications, both early and late. This does raise the question of whether they need to be followed-up in the hospital.

Aim To find out if any change in management occurred during the follow-up visits of patients with fractures of the middle-third or medial-third of the clavicle, and whether they had any complications, or were re-referred after discharge from the hospital.

Method We performed a retrospective study on 199 patients to see how often they were followed-up, and whether any change occurred in their management during the hospital follow-up visits. The patients were divided into low-energy and high-energy fracture groups.

Results Fifty nine percent (59.66%) of patients had a low energy fracture, and the majority of these patients (91.55%) had 2-4 follow-up visits without any change in their management. There was no record of any early complications in the series, and only one patient had a non-union (0.8%).

Discussion Several studies had shown that even with a shortening of 1.5 cm or more, there is little effect on the long-term functioning of the shoulder joint. None of the patients from the low-energy fracture group returned to the hospital, for at least six months after discharge, with problems related to their injury.

Conclusion This group could have been safely discharged after their first orthopaedic consultation.

Keywords: clavicle, follow-up, fracture

Introduction

All patients with fracture of the clavicle have traditionally been referred to the fracture clinic from the emergency department (ED). Currently there is very little evidence that all patients benefit from more than one orthopaedic follow-up visit. This is principally because low-energy fractures of the middle third or the medial third clavicle have a low incidence of complications, the most common being malunion and non-union (0-2.2%). Both malunion and non-union merit attention only when they cause symptoms such as pain or functional impairment. Several studies have shown that even with a shortening of 1.5 cm or more, there is little effect on the long-term functioning of the shoulder joint.¹⁻³

The aim of this study was to:

- identify the proportion of patients with fracture of the middle third or medial third of the clavicle, referred from the emergency department to the fracture clinic, who had complications following surgery or other interventions
- identify recommendations for the follow up of these patients that could be introduced into clinical practice for further evaluation.

Methods

Adults (over 16 years), sustaining fracture of the middle third or medial third of the clavicle (radiographic classification using the Allman system) either

as an isolated injury or associated with other injuries, were included in this retrospective study.⁶ Children were excluded from the study. Patients with fracture of the lateral end of the clavicle (Allman group 2) and those who were not followed up in our local fracture clinic were also excluded from the study. Notes of patients who attended the emergency department and were diagnosed with fracture of the clavicle, and subsequently referred to the fracture clinic during the period from 1 September 1999 to 31 December 2001 were examined. A proforma was used to document demographic information, mechanism of injury, injury details (including any additional injuries) and management in the emergency department as well as the fracture clinic. In addition, the fracture clinic notes were examined to record any subsequent complications or interventions required. Further examination of the hospital database, six months after discharge from the fracture clinic, identified whether any of the patients had been re-referred with problems relating to their primary injury, after being discharged from the fracture clinic.

Results

Over the study period, 119 patients were eligible for inclusion in this study (nine did not arrive for follow up, and two were referred to a different local hospital on the request of the patients). The male to female ratio was 1.5:1 and the age ranged from 16 to 91 years (median = 42 years). The majority of patients had sustained their injury as a result of a direct blow ($n = 93$, 54.4%), or simple fall ($n = 72$, 42.1%). Only 32 (18.7%) patients had an associated injury, most of which were lacerations remote from the fracture site. The patients were divided into two groups: low-energy and high-energy fractures. Those who had a history of trivial trauma, no soft-tissue injury, an undisplaced or minimally displaced fracture on X-ray, and no

neurovascular complication were grouped under the low-energy group. The rest were grouped under the high-energy group (fall from a mountain bike, comminuted fracture, skin damage or soft-tissue swelling, neurovascular injury). From their clinic letters, we made a note of the number of follow-up visits each patient had, and also the reason for each visit.

The results were as shown in Tables 1 and 2. The majority of the fractures in our series were undisplaced ($n = 71$, 59.66%). Six patients (all from the low-energy group) out of a total of 119 were seen and discharged after the first orthopaedic consultation, but the majority of the patients with a low-energy fracture ($n = 65$, 91.55%) had two, three or four follow-up visits. However, review of their notes revealed that no new clinical information or change in management occurred in any of these cases. They were either followed up until there were radiological signs of union, or until the patient had the full range of movement of the shoulder. Ten patients from the low-energy fracture group had four follow-up visits at an average period of 12.9 weeks, to ensure sound radiological union. Three patients from the high-energy group were suspected to have delayed/non-union, but only one of them required surgical intervention (internal fixation and bone grafting).

Table 1 Number of patients with low-energy and high-energy fractures

Group	Patients (<i>n</i>)
Low-energy fracture	71
High-energy fracture	48
Total	119

Table 2 Number of follow-up visits

Follow-up visits (<i>n</i>)	Average number of weeks	Total	Low-energy fracture	High-energy fracture
1	2.2	14	6	0
2	4.6	33	23	13
3	7.4	44	32	16
4	12.9	25	10	16
7	14.0	3	0	3

Discussion

Fracture of the clavicle is regarded as minor injury unless neurovascular or skin viability complications intervene.⁴ It rarely requires open reduction.⁵ Conservative treatment is the preferred method of treatment in cases of mid-clavicular fractures, unless there is an absolute indication for surgical therapy (4). Indications for surgery for mid-shaft fracture of the clavicles are:

- open injury
- impending skin disruption/vascular compromise
- progressive neurological loss
- scapulothoracic dissociation, i.e. floating shoulder
- displacement >2 cm
- polytrauma
- prolonged immobilisation.

According to the literature, conservative treatment is immobilisation until pain has disappeared. The majority of fractures can be treated in a broad arm sling. No subsequent therapy is needed. Even though displaced fractures of the clavicle cannot be reduced and maintained in a perfect position, cosmesis is acceptable, and functional results are uniformly excellent. Even if the ends of the fragment heal in an overlapped or bayonet position with a substantial bony prominence, this is largely resorbed with time and the mass decreases. As glenohumeral/humeroscapular spaces have not been violated, motion restriction is uncommon. Light weight lifting by six weeks, and full weight lifting by 12 weeks is recommended. Pendulum exercises

should be avoided as they cause increase of the displacing moment at the fracture site due to the weight of the arm.⁶

Although a variety of complications after non-operative treatment of a fractured clavicle have been reported, the overall incidence is low. These can be divided into early and late complications:

- early:
 - skin tenting
 - brachial plexus injury
 - subclavian vessel injury
- late:
 - malunion
 - non-union
 - re-fracture
 - post-traumatic arthritis.

Several studies have shown that even with a shortening of 1.5 cm or more, there is little effect on the long-term functioning of the shoulder joint.^{1–3} The incidence of non-union after conservative treatment of a fractured clavicle is 0–2.2%. Our series did not have any early complications, and we had a non-union rate of 0.8% (one patient). This patient had a displaced fracture with slight comminution, which eventually required open reduction, internal fixation and bone grafting. None of the patients from the low-energy fracture group had any early complications, and all of them healed uneventfully. None of them returned to the hospital, for at least six months after discharge, with problems related to their injury. This group could have been safely discharged after their first orthopaedic consultation (see Figure 1).

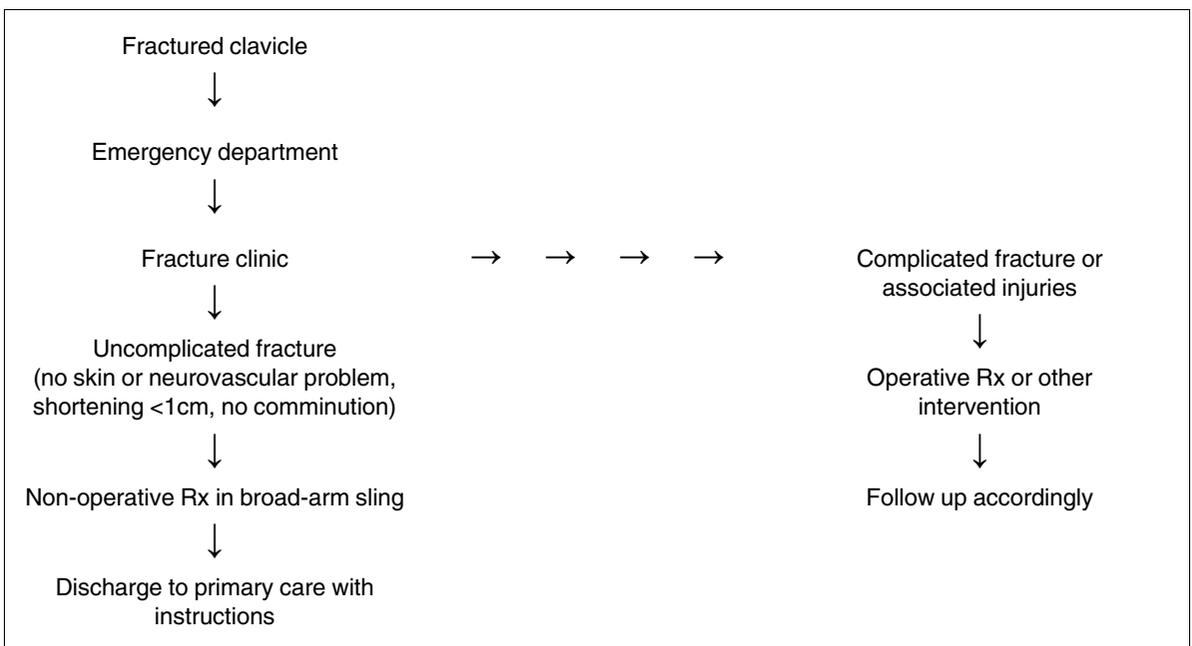


Figure 1 Flow chart for adult patients with a fracture middle or medial third of the clavicle

Study limitations

Our study was small and limited to a single hospital. The results would be more generalisable and accurate if a prospective multi-centre evaluation were to be performed. The results would not apply to places that still use figure of eight bandage as the method of immobilisation (which needs monitoring). But excluding such places, we strongly feel that follow-up of middle or medial third fractures of the clavicle with minimal or no displacement can be safely abandoned.

Conclusions

In spite of some limitations, our study does question the necessity of multiple follow-ups for all patients with fracture of the clavicle. An extra visit is a waste of time as well as resources – probably an avoidable one!

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CONFLICTS OF INTEREST

None.

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