

Bilateral Clavicle Fractures: A Report of Three Cases

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ABSTRACT

Bilateral clavicle fractures are uncommonly reported in the literature with the incidence being less than 0.5% of all the clavicle fractures. Bilateral clavicle fractures are caused either by high-energy transfer of compression forces across both shoulder girdles or by a direct trauma to one clavicle followed by that to the other clavicle. These fractures could be missed due to their association with more severe chest injuries or a more symptomatically displaced fracture on one side or due to inadequate chest radiographs. We report three cases of traumatic bilateral clavicle fractures with three modes of injuries in different age groups. All the fractures were treated conservatively with good functional outcomes without any sequelae. Bilateral clavicle fractures should be actively sought by every trauma team with proper clinical examination and chest radiographs including both shoulder joints in high-energy trauma cases or with bilateral shoulder compression injuries.

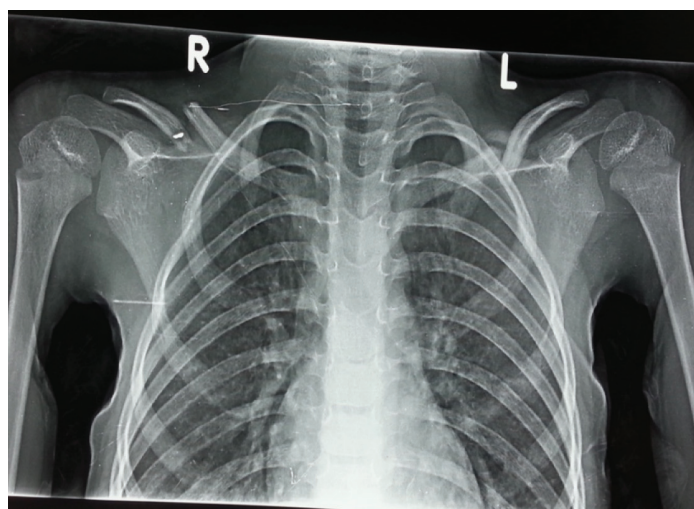
Keywords: Compression, Incidence, Shoulder, Trauma

CASE SERIES

We have encountered three cases of bilateral clavicle fractures with different modes of trauma in three different age groups. One of these patients had a high-velocity roadside accident while the other case suffered a crush injury between a wall and a tractor. In the third case, a motorcycle fell over the patient. All of the fractures united well after conservative treatment with the return of normal functional activity. With the increasing incidence of high-energy trauma, we may encounter more of these injuries in the future.

Case 1

A 6-year-old girl presented to our hospital with pain swelling and bony instability over both the midclavicular regions. She was unable to move both of her shoulder girdles due to pain. She fell off from a stationary motorcycle and then the motorcycle fell over her. The patient had a history of a short period of unconsciousness followed by one episode of vomiting. Her GCS score was to be normal when brought to the hospital after few hours of the injury. CT scan head was found normal. X-ray chest with bilateral shoulders revealed displaced mid-clavicle fractures on both the sides [Table/Fig-1]. She had no neurovascular injuries in any of



[Table/Fig-1]: Radiograph of a six-year-old female shows displaced bilateral mid-clavicle fractures.

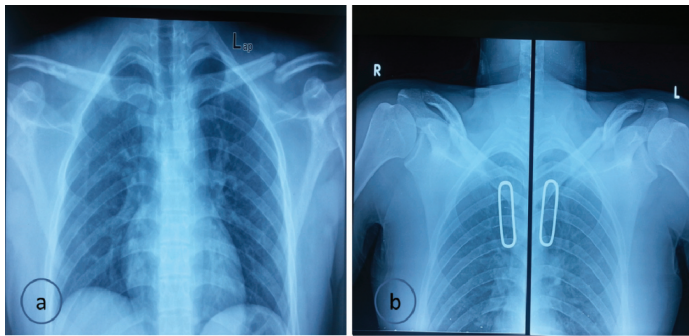


[Table/Fig-2a,b]: Clinical photographs of a six-year-old female shows full functional recovery of shoulder 6 weeks after the trauma.

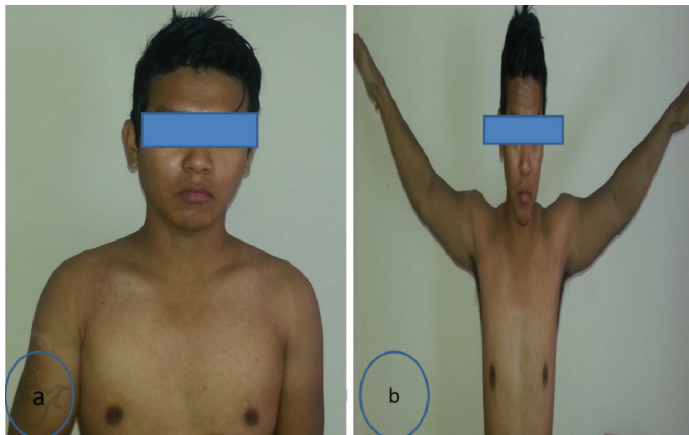
her upper limbs. The trauma team managed the fractures with a figure-of-8 bandage with shoulder slings conservatively. The patient was observed for 24 hours for a minor head injury that she sustained and was discharged thereafter. She was reviewed in outdoor at 3 weeks, 6 weeks and 12 weeks respectively. Both clavicles united in acceptable positions with full, pain-free shoulder function bilaterally [Table/Fig-2a,b].

Case 2

A 25-year-old man was involved in a high-velocity road traffic accident when his bike skidded on a road divider. He complained of pain on the left upper chest wall and in the left clavicle region. On examination he was found to be hemodynamically stable. He sustained a blunt chest injury with tenderness and bruises over the left upper chest wall. He was found to have multiple rib fractures on the left side along with a left clavicle fracture [Table/Fig-3a] on initial evaluation. The patient had no lung injuries and had a normal respiratory function. He was treated with analgesics, chest physiotherapy and mobilization for chest injury. A clavicle brace with arm sling was given for the fractured clavicle. He complained of pain in the right clavicular region during the follow-up after three days. Clavicle fractures were detected on both sides when a repeat roentgenogram was taken to include both clavicles. He made an uneventful recovery from his chest



[Table/Fig-3a,b]: Radiograph of a 25-year-old male showing: (a) displaced left mid-clavicle fracture; and (b) follow-up radiograph at 12 weeks showing healing of bilateral clavicle fractures.



[Table/Fig-4a,b]: Clinical photographs showing: (a) minimal deformity of bilateral clavicles; and (b) full functional recovery of shoulders at 12 weeks after trauma.

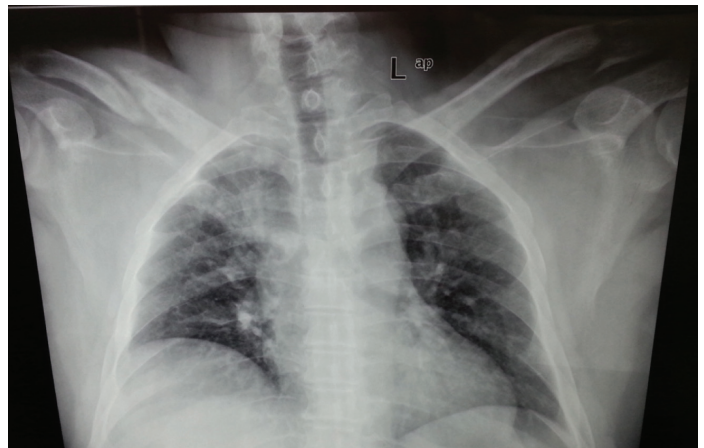
injuries. Both clavicles united well [Table/Fig-3b] on conservative treatment with minimal deformity [Table/Fig-4a]. He had excellent shoulder function at 12 weeks follow-up [Table/Fig-4b].

Case 3

A 45-year-old man was crushed between a tractor and a wall while working in the field. He was conscious when he came to the hospital complaining of pain and swelling in bilateral clavicular regions. The patient had contusion and superficial bruises on the left shoulder which faced the wall at the time of injury. On radiological examination he was found to have bilateral clavicular fractures [Table/Fig-5]. On the right side, there was a mid shaft fracture and on the left, the fracture was at the lateral end of the clavicle. The chest and pelvis were screened for injuries and were found to be normal. Bilateral arm slings were applied. Radiological and clinical union of the fractures was evident at 12 weeks with normal shoulder function bilaterally.

DISCUSSION

Clavicle fractures are common injuries in all age groups [1]. They account for 2% to 5% of all the fractures with the incidence in children being >10% [2,3]. Although unilateral clavicle fractures are commonly encountered, bilateral clavicle fractures have been reported extremely rarely in the literature [4,5]. The incidence of bilateral involvement is less than 0.5% of all the clavicle fractures [2,6,7]. Conservative management has been the preferred treatment modality for most of the clavicle fractures because of the high complication rates reported after surgical treatment [8]. But there are evidences in the literature that suggest a high risk for nonunion or shoulder dysfunction after non-operative treatment in bilateral clavicle fractures [9-11]. The mechanism of sustaining bilateral clavicle fractures is different from that of a unilateral clavicle fracture. They are often caused by a compressive force across both shoulder girdles, direct blows to both shoulder girdles or an indirect blow such as a fall onto the shoulder [5,9]. Bilateral



[Table/Fig-5]: Radiograph of a 45-year-old male show displaced right mid-clavicle fracture and minimally displaced left lateral-end clavicle fracture.

clavicle fractures are usually associated with high-energy trauma and therefore are associated with other concomitant injuries.

In the three cases described above, mode of trauma was different but all of them involved a high-energy transfer of forces across the shoulder joint. Of these patients who suffered bilateral clavicle fractures, one patient (case 1) had an associated minor head injury followed by an uneventful recovery whereas another had (case 2) chest injuries with multiple rib fractures which were treated conservatively. The third patient (case 3) with bilateral clavicle fractures (midshaft on one side and lateral-end on the other side) had a compression injury across the shoulder joint.

In one of these cases (case 2), the clavicle fracture on one side was missed on initial examination and was detected only when the patient was re-examined subsequently and radiographs were taken on large films that included both clavicles. When evaluating retrospectively, it was concluded that the undisplaced fracture was not detected on the initial radiograph [Table/Fig-3a].

Previous literature favoured operative intervention for bilateral clavicle fractures, especially in cases with compromised ventilatory function [12,13], though Sutherland AG et al., showed good functional results with conservative management of bilateral clavicle fractures. In all of our three cases, conservative management was given. All the patients returned to normal shoulder function within 12 weeks [5].

CONCLUSION

Bilateral clavicle fractures are not as uncommon as has been illustrated in the previous literature. The trauma team should be more vigilant, especially in high-energy trauma cases to detect and treat such injuries. Although we achieved good functional results with non-operative treatment in all our cases, there is still a need of a comparative study as these injuries will be quite more common in the near future.

ACKNOWLEDGEMENTS

The authors wish to thank Dr. Ambika Jhanwar for her help in preparing the manuscript.

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Date of Submission: **Nov 05, 2015**

Date of Peer Review: **Jan 30, 2016**

Date of Acceptance: **Feb 23, 2016**

Date of Publishing: **Jun 01, 2016**

FINANCIAL OR OTHER COMPETING INTERESTS: None.