IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 24, Issue 12 Ser. 9 (December. 2025), PP 01-05
www.iosrjournals.org

Bilateral Clavicular Fractures In Polytraumatised Patients: Two Case Reports

B. B. Buba, R. O. Maleeq, A. S. Yahaya, I.M. Haris, A. C. Ugwu
Department Of Orthopaedics And Traumatology, Federal Teaching Hospital Birini Kebbi, Nigeria

Abstract
Clavicular fractures are among the most frequently encountered injuries in orthopaedic trauma practice, accounting for approximately 2.6–5% of all fractures and up to 44% of shoulder girdle injuries. Despite their relative frequency, bilateral clavicular injuries occurring simultaneously in the same patient are rare. Even more uncommon is the association of bilateral clavicular fracture with unilateral sternoclavicular joint (SCJ) dislocation. Consequently, such injury patterns are infrequently discussed in standard orthopaedic textbooks and are underrepresented in the existing literature. We report two distinct cases of bilateral clavicular injuries. The first case involved simultaneous bilateral clavicular fractures, while the second case comprised a left clavicular fracture associated with a right sternoclavicular joint dislocation. In both patients, the clavicular injuries occurred in the context of high-energy trauma and were accompanied by significant associated injuries involving both orthopaedic and non-orthopaedic systems. These cases highlight the diagnostic and therapeutic challenges posed by bilateral clavicular injuries, particularly in polytrauma settings where life-threatening conditions may divert attention from less obvious but clinically significant shoulder girdle injuries. A high index of suspicion, careful clinical evaluation, and appropriate imaging are essential to avoid missed or delayed diagnoses. Early recognition of such rare injury patterns is crucial, as bilateral clavicular involvement may compromise upper limb function, chest wall mechanics, and respiratory efficiency, thereby influencing overall patient outcomes. This report adds to the limited body of evidence on bilateral clavicular injuries and underscores the importance of comprehensive trauma assessment. It also contributes to the growing discussion on optimal management strategies for uncommon clavicular injury patterns, including the role of operative versus non-operative treatment in complex and asymmetric presentations.

Date of Submission: 20-12-2025 Date of Acceptance: 30-12-2025

I. Introduction

Injuries involving the clavicle may present as fractures, acromioclavicular (AC) joint separations, or sternoclavicular joint (SCJ) dislocations. Among these, clavicular fractures are by far the most common and constitute a significant proportion of shoulder girdle trauma encountered in clinical practice. The clavicle serves as the sole bony connection between the axial skeleton and the upper limb, functioning as a rigid strut that maintains the lateral position of the shoulder while transmitting mechanical forces from the upper extremity to the trunk [1,2].

Several anatomical and biomechanical characteristics predispose the clavicle to injury. It is relatively slender when compared with adjacent skeletal structures, has a complex S-shaped morphology, and is positioned subcutaneously along its entire length, rendering it both palpable and visually prominent, particularly in individuals with low body mass [3]. In addition, the medial and lateral ends of the clavicle are stabilized by strong ligamentous structures, including the costoclavicular, acromioclavicular, and coracoclavicular ligaments. As a result, the bone itself is more likely to fail under load before these ligaments rupture, especially following high-energy trauma [4].

Consequently, clavicular fractures are among the most frequently reported fractures in trauma patients, accounting for approximately 2.6–4.1% of all fractures and up to 35–44% of injuries involving the shoulder girdle [2,5]. The majority are unilateral midshaft fractures resulting from a direct blow to the shoulder, a fall onto the lateral aspect of the shoulder, or a fall on an outstretched hand. In contrast, bilateral clavicular injuries occurring simultaneously in the same individual are exceedingly rare, with an incidence reported to be less than 0.5% of all clavicular fractures [6,7].

Even rarer is the combination of a bilateral clavicular fracture a unilateral sternoclavicular joint dislocation. Sternoclavicular joint dislocations themselves represent less than 1% of all joint dislocations and are typically associated with high-energy mechanisms such as motor vehicle collisions or falls from significant heights [8]. When such injuries occur bilaterally or asymmetrically, they are frequently accompanied by additional orthopaedic and non-orthopaedic injuries, reflecting the magnitude of the traumatic force involved [9]. These

associated injuries may complicate diagnosis and delay definitive management, particularly in polytrauma settings where attention is often directed toward immediately life-threatening conditions.

The rarity of bilateral clavicular injuries and combined clavicle–SCJ injury patterns means they are sparsely discussed in standard orthopaedic literature, and evidence guiding optimal management remains limited to case reports and small case series. Nevertheless, these injuries are clinically significant, as bilateral involvement of the clavicle may impair upper limb function, compromise chest wall stability, and adversely affect respiratory mechanics, thereby influencing overall patient outcomes [6,10].

This case series reports two rare presentations of bilateral clavicular injuries sustained following high-energy trauma. Both cases were managed operatively and were associated with additional systemic injuries. By documenting these cases, this report aims to contribute to the limited body of literature on simultaneous bilateral clavicular injuries, emphasize the importance of thorough shoulder girdle evaluation in trauma patients, and highlight key considerations in the management of these uncommon but clinically relevant injury patterns.

II. Case Reports

Case 1: Simultaneous Bilateral Clavicular Fractures with Associated Polytrauma

A 32-year-old male was admitted through the Accident and Emergency Unit of our hospital following referral from a peripheral health facility, where initial resuscitation had been undertaken. He presented approximately eight hours after sustaining injuries in a high-energy motor vehicular crash. He was an unrestrained front-seat passenger in a crossover vehicle that skidded off the road and somersaulted, resulting in his ejection from the vehicle. At presentation, he complained of bilateral shoulder pain, anterior chest pain, generalized abdominal pain, and pain with swelling in the proximal right thigh associated with an open wound and inability to bear weight on the right lower limb.

On arrival, his vital signs were stable, with a blood pressure of 100/60 mmHg, a pulse rate of 84 beats per minute that was full and regular, and a respiratory rate of 20 cycles per minute. He was conscious, alert, and oriented, with no evidence of respiratory distress. General examination revealed a young man who was afebrile, not pale, anicteric, acyanosed, and well hydrated, with no peripheral edema.

Musculoskeletal examination revealed visible deformities and marked tenderness over the midshaft regions of both clavicles, with painful restriction of active shoulder abduction above shoulder level bilaterally. No open wounds were noted over the clavicles. Subcutaneous crepitus was palpable around the base of the neck, although chest auscultation revealed clear lung fields bilaterally. Examination of the right lower limb showed a sutured longitudinal wound over the lateral aspect of the proximal third of the thigh, with circumferential swelling and localized tenderness. Neurovascular status of the limb was intact.

Plain radiographs demonstrated displaced midshaft fractures of both clavicles and a right subtrochanteric femoral fracture. Based on clinical and radiological findings, the patient was managed as a case of multiple injuries, including bilateral closed clavicular fractures, a Gustilo–Anderson grade II open right subtrochanteric femoral fracture, blunt chest trauma with subcutaneous emphysema, and suspected blunt abdominal injury. Subsequent evaluation and serial abdominal examinations ruled out hollow viscus perforation.

The patient was managed in a multidisciplinary manner involving orthopaedics, general surgery, anaesthesia, and physiotherapy. Early physiotherapy input was instituted to initiate chest care and limb mobilization. Following optimization for surgery, he underwent definitive operative management in a single operative session, with two orthopaedic teams working concurrently. Open reduction and internal fixation of both clavicles were performed using reconstruction plates and screws, while the right subtrochanteric femoral fracture was stabilized using a proximal femoral locking plate.

Immediate postoperative clinical and radiographic assessments were satisfactory, with stable fixation and acceptable alignment. The patient commenced wheelchair-assisted mobilization within 24 hours postoperatively and was subsequently discharged one week later with both upper limbs supported in broad arm slings and a structured rehabilitation plan.

Case 2: Bilateral Clavicular Fracture with Unilateral Sternoclavicular Joint Dislocation

The second case involved a 22-year-old female who presented to the Accident and Emergency Unit approximately 10 hours after sustaining injuries in a pedestrian–motor vehicle collision. She had been referred from a peripheral hospital after initial stabilization. The patient was knocked down by a commercial vehicle while attempting to cross a busy road. At presentation, she complained of right shoulder pain associated with a visible prominence over the clavicular region, left-sided upper chest pain, facial injuries, and an open scalp wound. There was a history of loss of consciousness lasting several hours prior to presentation.

On examination, her vital signs were stable, and neurological assessment revealed a Glasgow Coma Scale score of 15/15. Musculoskeletal examination demonstrated deformity and tenderness over the midshaft of the right clavicle. On the left side, there was a prominent, lumpy deformity and localized tenderness over the sternoclavicular joint, consistent with joint dislocation. Craniofacial examination revealed facial asymmetry with

deformity around the right mandibular region, as well as a large full-thickness avulsion injury involving the occipitotemporal region of the scalp, with exposed calvarium.

Radiographic evaluation revealed bilateral right midshaft clavicular fracture, anterior dislocation of the left sternoclavicular joint, and associated mandibular fractures involving the parasymphyseal region and the right condyle. Based on these findings, the patient was managed as a case of multiple injuries, including mild traumatic brain injury, bilateral closed clavicular fracture with left sided closed anterior sternoclavicular joint dislocation, closed parasymphyseal and right mandibular condylar fractures, and a full-thickness occipitotemporal scalp avulsion injury.

Definitive management was planned and executed using a multidisciplinary approach involving orthopaedics, maxillofacial surgery, and plastic surgery. In a combined orthopaedic and maxillofacial surgical session, the patient underwent open reduction and internal fixation of the right clavicle using a reconstruction plate and screws. The left sternoclavicular joint dislocation was reduced and stabilized with a single cancellous screw. Concurrently, open reduction and internal fixation of the mandibular fractures were performed using miniplates and screws. At a later stage, the scalp defect was addressed by the plastic surgery team with excision of devitalized tissue and coverage using a rotational flap.

III. Discussion

The management of clavicular injuries is influenced by multiple factors, including fracture pattern, degree of displacement, comminution, soft tissue involvement, associated injuries, and patient-specific considerations. Traditionally, the majority of clavicular fractures, particularly those involving the midshaft, have been managed non-operatively with generally favourable outcomes. Early studies reported union rates approaching 95 percent following conservative treatment, compared with approximately 4 percent following operative intervention, which established non-surgical management as the standard of care for Allman group I fractures for several decades [4,10].

More recent evidence, however, has challenged this traditional approach. Contemporary studies have demonstrated higher rates of non-union, symptomatic malunion, shoulder girdle dysfunction, and patient dissatisfaction following non-operative management of displaced midshaft clavicular fractures, particularly those classified as Robinson type 2B, which are characterized by displacement and comminution [10,11,12]. Improved surgical techniques, better implant design, and increased familiarity with the regional anatomy have also contributed to a shift toward operative fixation in carefully selected patients.

In the first case, the patient sustained simultaneous bilateral midshaft clavicular fractures in the context of high-energy trauma and polytrauma. Although the fractures were closed and involved the middle third of the clavicle, an injury pattern traditionally suitable for non-operative care, the bilateral involvement significantly altered the functional and physiological implications. Bilateral clavicular fractures may compromise shoulder girdle stability, restrict upper limb function, and impair chest wall mechanics, particularly in patients with associated thoracic injuries, thereby increasing the risk of respiratory complications [13,14]. In addition, the need for operative fixation of a concomitant subtrochanteric femoral fracture provided an opportunity to address all major skeletal injuries in a single operative setting. After informed discussion of treatment options, operative fixation was selected. Open reduction and internal fixation with reconstruction plates and screws provided stable anatomical alignment, facilitated early mobilization, and simplified nursing care and rehabilitation, consistent with recommendations in the literature for bilateral clavicular injuries and fractures associated with polytrauma [13,15].

Plate fixation remains the most reliable method for the management of displaced or comminuted clavicular fractures, particularly Robinson type 2B injuries, as it offers superior rotational and axial stability when compared with intramedullary fixation methods [16]. Although intramedullary Kirschner wires are less invasive, they are unsuitable in the presence of significant comminution and are associated with complications such as implant migration, inadequate fracture control, and the need for secondary procedures [17]. The satisfactory early and medium-term functional outcomes observed in this patient are in keeping with published reports supporting operative fixation in complex, bilateral, or high-demand clinical scenarios.

The second case represents an even rarer injury pattern, consisting of a bilateral clavicular fracture with a contralateral sternoclavicular joint dislocation. Sternoclavicular joint dislocations account for less than 1 percent of all joint dislocations and are typically associated with high-energy mechanisms of injury [8]. Anterior dislocations are more common and are often treated non-operatively, whereas posterior dislocations are considered orthopaedic emergencies because of the risk to mediastinal structures and usually require surgical intervention [18].

Despite the general preference for conservative management of anterior sternoclavicular joint dislocations, operative stabilization may be indicated in selected cases, particularly when there is significant pain, instability, functional limitation, cosmetic deformity, or associated injuries involving the shoulder girdle [19]. In this patient, the presence of a contralateral clavicular fracture, mandibular fractures, and an extensive scalp

avulsion injury necessitated a comprehensive operative strategy aimed at restoring skeletal stability and enabling coordinated rehabilitation. Surgical stabilization of both the clavicle and the sternoclavicular joint provided immediate mechanical stability of the shoulder girdle, facilitated early functional recovery, and reduced the likelihood of chronic instability or persistent deformity.

These cases highlight the importance of a systematic evaluation of the entire shoulder girdle in patients sustaining high-energy trauma. Bilateral clavicular injuries and combined clavicle and sternoclavicular joint injury patterns may be easily overlooked in the presence of more obvious or life-threatening injuries. In keeping with CARE reporting guidelines, detailed documentation of clinical presentation, diagnostic evaluation, therapeutic decision-making, and outcomes enhances transparency and contributes meaningful data to the limited literature on these uncommon but clinically significant injury patterns.

IV. Conclusion

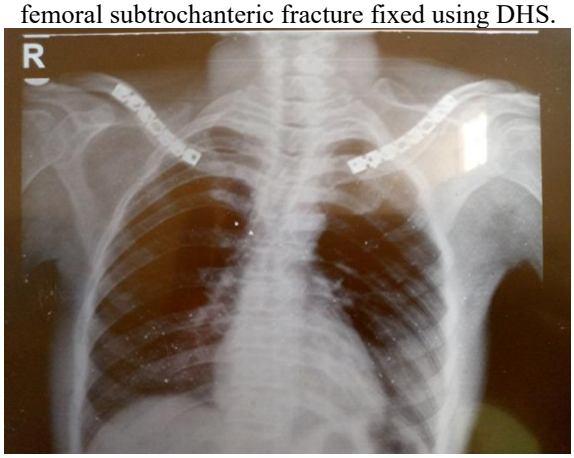
Simultaneous bilateral clavicular injuries, including bilateral clavicular fractures and combined clavicular fracture with contralateral sternoclavicular joint dislocation, are rare and typically result from high-energy trauma. These injury patterns are frequently associated with polytrauma and may be overlooked during initial assessment due to competing life-threatening conditions. Although non-operative management remains appropriate for many isolated clavicular fractures, operative fixation should be strongly considered in cases of bilateral involvement, significant displacement or comminution, associated thoracic or systemic injuries, and when early functional recovery is desirable. A multidisciplinary approach, careful patient selection, and individualized treatment planning are essential for optimal outcomes. Reporting such cases in accordance with CARE guidelines contributes to improved awareness and strengthens the evidence base guiding management of uncommon shoulder girdle injuries

References

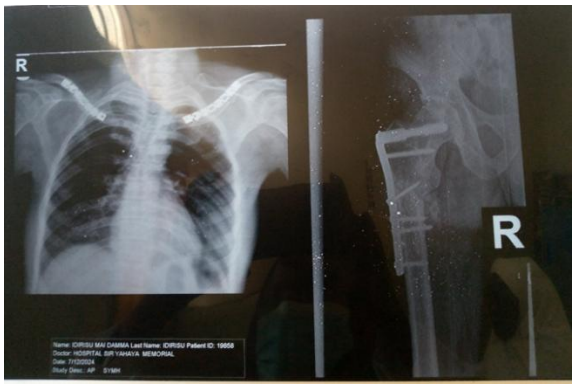
[1]. Rockwood CA, Matsen FA, Wirth MA, Lippitt SB. Rockwood And Matsen's The Shoulder. 5th Ed. Philadelphia: Elsevier; 2017.
[2]. Robinson CM. Fractures Of The Clavicle In The Adult: Epidemiology And Classification. J Bone Joint Surg Br. 1998;80(3):476–484.
[3]. Standring S, Ed. Gray's Anatomy: The Anatomical Basis Of Clinical Practice. 42nd Ed. London: Elsevier; 2021.
[4]. Neer CS. Nonunion Of The Clavicle. JAMA. 1960;172:1006–1011.
[5]. Postacchini F, Gumina S, De Santis P, Albo F. Epidemiology Of Clavicle Fractures. J Shoulder Elbow Surg. 2002;11(5):452–456.
[6]. Banerjee R, Waterman B, Padalecki J, Robertson W. Management Of Distal Clavicle Fractures. J Am Acad Orthop Surg. 2011;19(7):392–401.
[7]. Khan LAK, Bradnock TJ, Scott C, Robinson CM. Fractures Of The Clavicle. J Bone Joint Surg Am. 2009;91(2):447–460.
[8]. Nettles JL, Linscheid RL. Sternoclavicular Dislocations. J Trauma. 1968;8(2):158–164.
[9]. Throckmorton T, Kuhn JE. Fractures Of The Medial End Of The Clavicle. J Shoulder Elbow Surg. 2007;16(1):49–54.
[10]. Andersen K, Jensen PO, Lauritzen J. Treatment Of Clavicular Fractures: Figure-Of-Eight Bandage Versus A Simple Sling. Acta Orthop Scand. 1987;58(1):71–74.
[11]. Mckee MD, Pedersen EM, Jones C, Et Al. Deficits Following Nonoperative Treatment Of Displaced Midshaft Clavicular Fractures. *J Bone Joint Surg Am*. 2006;88(1):35–40.
[12]. Robinson CM, Goudie EB, Murray IR, Et Al. Open Reduction And Plate Fixation Versus Nonoperative Treatment For Displaced Midshaft Clavicular Fractures. A Multicenter, Randomized, Controlled Trial. *J Bone Joint Surg Am*. 2013;95(17):1576–1584.
[13]. Nowak J, Mallmin H, Larsson S. The Aetiology And Epidemiology Of Clavicular Fractures. A Prospective Study During A Two-Year Period In Uppsala, Sweden. *Injury*. 2000;31(5):353–358.
[14]. Hoogervorst P, Van Schie P, Van Der Werken C. Bilateral Fractures Of The Clavicle. *Injury*. 1999;30(4):303–305.
[15]. Van Der Meijden OA, Gaskill TR, Millett PJ. Treatment Of Clavicle Fractures. Current Concepts Review. *J Shoulder Elbow Surg*. 2012;21(3):423–429.
[16]. Cho CH, Song KS, Min BW, Bae KC, Lee KJ. Operative Treatment Of Clavicle Midshaft Fractures. Comparison Between Reconstruction Plate And Reconstruction Locking Compression Plate. *Clin Orthop Surg*. 2010;2(3):154–159.
[17]. Smekal V, Irenberger A, Attal R, Et Al. Elastic Stable Intramedullary Nailing Versus Nonoperative Treatment Of Displaced Midshaft Clavicular Fractures. A Randomized, Controlled, Clinical Trial. *J Orthop Trauma*. 2009;23(2):106–112.
[18]. Rockwood CA, Wirth MA. Disorders Of The Sternoclavicular Joint. In: Rockwood CA, Matsen FA, Wirth MA, Lippitt SB, Eds. *The Shoulder*. 5th Ed. Philadelphia: Elsevier; 2017:527–559.
[19]. Throckmorton T, Kuhn JE. Fractures Of The Medial End Of The Clavicle. *J Shoulder Elbow Surg*. 2007;16(1):49–54.

Figures

Figure 1. Postoperative photograph showing (A) plate fixation of bilateral clavicular fractures and (B) right femoral subtrochanteric fracture fixed using DHS.



A



B

Figure 2. Postoperative radiograph of a patient with bilateral clcaivualr fracrue and unilateral stenoclavicualr joint dislcoaciton