

## CASE REPORT

BILATERAL CLAVICLE FRACTURES TREATED WITH SCREW  
INTRAMEDULLARY FLEXIBLE NAILPriyam Choudhury<sup>1</sup>, Ashutosh Mohapatra<sup>2</sup>, Piyush Gadegone<sup>3</sup>, Wasudeo Gadegone<sup>4</sup>,  
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Clavicle fractures have been known to be common injuries with a reported incidence of 2.4–4% amongst all fractures, however the incidence of bilateral clavicle fractures is rare. A thorough search of all English language journals revealed that bilateral clavicle fractures comprised 0.43% of all clavicle fractures, with an overall incidence of between 0.011–0.017%. Though the surgical intervention of clavicle fractures uses many implants, never has been screw intramedullary flexible nail been used in a bilateral clavicle fracture. We report a case of a 32-year-old male who presented with bilateral clavicle fracture and was treated successfully.

**Keywords:** Bilateral clavicle fractures, closed reduction, internal fixation, intramedullary

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## INTRODUCTION

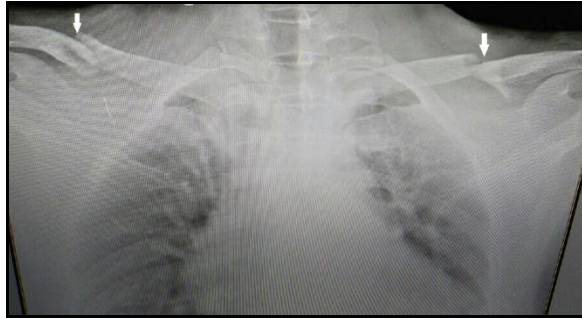
Clavicle fractures have been known to be common injuries with a reported incidence of 2.4–4% amongst all fractures, however the incidence of bilateral clavicle fractures is rare.<sup>1,2</sup> Bout did a thorough search of all English language journals and revealed that bilateral clavicle fractures comprised 0.43% of all clavicle fractures, with an overall incidence of between 0.011–0.017%.<sup>3</sup> This number can be the underrepresentation of the true number since clavicle fractures are the least paid attention to in polytrauma cases and can be missed completely.<sup>1</sup> Axial loading caused by a direct insult to the shoulder girdle is the mechanism of the injury.<sup>2</sup>

Due to its scarce nature, there is no unanimity about the treatment that should be undertaken. Traditionally, majority of the clavicle fractures have been treated conservatively due to the fear of high complication rates associated with surgical interventions but recent studies state that conservative management leads to an increased risk for non-union and shoulder dysfunction.<sup>4,5</sup> If surgical intervention is opted for, there is an argument for the best type of implant. Various implants like intramedullary k wire, anatomical locking plate, and 3.5 mm reconstructive plates have been used.<sup>1</sup> We present this case of a 32-year-old male with a diagnosis of Bilateral Clavicle Fractures who was operated successfully with a Screw Intramedullary Flexible Nail (SIFN).

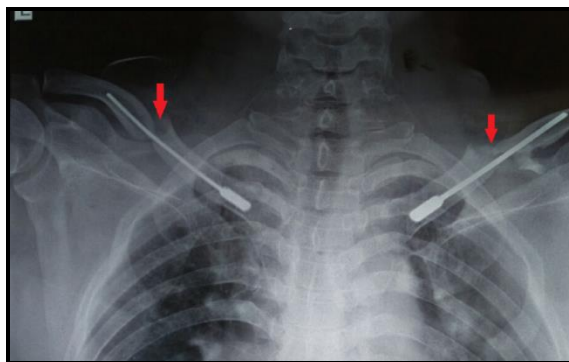
## CASE REPORT

A 32year old male was brought to our trauma centre with a history of Road Traffic Accident (RTA). He had bruises and contusions over the bilateral clavicular and shoulder region and a contused lacerated wound (CLW) measuring 2.5×2 cm on the dorsal aspect of the right forearm. Due to severe shoulder pain, he was unable to raise his shoulders. He was conscious, stable haemodynamically with no chest and pelvis injuries. Neurovascular status was normal too. Chest and shoulder radiograph revealed bilateral midshaft displaced clavicle fractures classified as Robinson Type2B for both the fractures (Figure-1).<sup>6</sup> Surgery in the form of Close Reduction Internal Fixation (CRIF) with SIFN was planned. Patient was sedated under general anaesthesia and a bolster was placed under the right clavicle to make it more prominent. Entire procedure was performed under fluoroscopic guidance. The medial end of clavicle was palpated, a 1 cm incision was made over it and a hole was drilled with a 3.2 mm drill bit in the anterior cortex. After the expansion of the entry point with an awl, reaming of the canal was done. A SIFN of suitable diameter and length was inserted in the medullary canal of clavicle with a T-handle till the nail reached the fracture site. The fracture was reduced with the help of towel clips. Later the satisfactory reduction of the fragments was checked under fluoroscopy and the nail was progressed through the fracture site till it reached distal end of the clavicle. One of the most important steps taken was to ensure the sufficient engagement of the distal fragment, so that the medial end of screw nail was

screwed in the metaphyseal region of the medial end of clavicle. The skin was subsequently closed. Similar steps were undertaken for the contralateral clavicle too. Post-operative radiographs showed anatomical reduction of both the clavicles (Figure-2). Both the shoulders were immobilised with universal shoulder immobilizer for two weeks.



**Figure-1: Preoperative radiograph showing bilateral clavicle fractures (white arrow).**



**Figure-2: Postoperative radiograph showing anatomical reduction with the screw intramedullary flexible nail in situ (red arrow).**

## DISCUSSION

The reported incidence of bilateral clavicle fractures is a measly 0.5%.<sup>1,2</sup> This is the first time that we encountered such a case. Unlike unilateral fractures, these are caused by high energy trauma involving the transfer of compressive forces across both the shoulder girdles.<sup>3</sup> Our patient was involved in a road traffic accident (RTA) where he was pinned down against a wall by a car. The transfer of compressive forces across shoulder girdles can be postulated as the mechanism in our patient. Previous reports too mention this mechanism of injury as the cause.<sup>3,7,8</sup> Direct trauma to clavicle as also been stated as a cause in literature.<sup>9,10</sup> Since the mechanism of injury is high energy trauma, the association of concomitant injuries are much more frequent and severe with injuries like multiple rib fractures, pneumothorax, haemothorax being frequently reported.<sup>2,3,11</sup> Our patient did not present with any severe associated

injury except a CLW on the dorsal aspect of the right forearm. Few previous reports did not have any severe associated injury either.<sup>1,12</sup> In polytrauma cases, particularly those with life-threatening injuries, there is a tendency to give clavicular fractures little attention at the outset. They may be overlooked as they are relatively nonthreatening and almost always unite. Also, a fairly common practice is the use of small films for clavicular roentgenograms, that results in unintentional missed diagnosis of the fracture.<sup>11</sup> This was seen one of the reported cases where the patient presented with multiple rib fractures along with the BLCF, but only the left clavicle fracture was detected. Later when he presented with complaints of pain on the right side, a repeat radiograph with larger films was performed which detected the missed right clavicular fracture.<sup>4</sup> We believe that such a blunder can be avoided by a combination of thorough clinical examination, a series of trauma radiographs and the use of large radiograph films.

Traditionally, majority of the clavicle fractures have been treated conservatively due to the fear of high complication rates associated with surgical interventions but recent studies state that conservative management leads to an increased risk for non-union and shoulder dysfunction.<sup>4,5</sup> Along with non-union and shoulder dysfunction, conservative treatment of bilateral clavicle fractures can also completely debilitate a patient and render him dependent on others. Conservative treatment leads to increased pain causing more stiffness in the future.<sup>1</sup> Bout in his report suggests that the treatment plan of bilateral clavicle fractures should differ from unilateral fractures, since every unilateral fracture is individually evaluated for a possible surgical intervention whereas bilateral fractures intrinsically demand surgical stabilization.<sup>3</sup>

Operative measures used for bilateral clavicle fractures include reconstruction plates, anatomical locking plates, angle stable T locking plates, intramedullary k wire, intramedullary titanium nail and even external fixators.<sup>1,3,9,12-14</sup> We operated our patient with the use of screw intramedullary flexible nail. As per our knowledge this is the first case of BLCF to use this implant. The use of an intramedullary device carries advantages of a smaller incision, less soft tissue dissection, and load sharing fixation with relative stability that encourages copious callus formation.<sup>15</sup> But they do come with their own share of pitfalls like nail migration.<sup>16</sup> Screw intramedullary flexible nail overcomes these problems. It fits snugly in the medial metaphyseal area of clavicle after screwing preventing its back out. Also, the lateral migration is prevented by the virtue of its medial end being larger than lateral end.

Breakage of nail has not been reported yet.<sup>15</sup> We too have never encountered breakage in any of our previously operated cases.

## CONCLUSION

Bilateral clavicle fractures are a rare entity seldom encountered in the orthopaedic practice. They occur during high energy trauma and should be thoroughly evaluated by the clinician since they can be easily missed. Though the management protocol of unilateral clavicle fractures is well understood, the same cannot be said about bilateral fractures. Bilateral clavicle fractures demand surgical stabilization since a conservative approach can incapacitate the patient and cause non-union.

We lost this patient to follow up since he met with a Road Traffic Accident (RTA), a month after discharge and hence his progress couldn't be monitored. Osteosynthesis with Plating is the gold standard for treating clavicular fractures and the use of flexible nails requires more research. Our purpose of presenting this case is to highlight the occurrence of this rare entity and the probable use of SIFN as a treatment option.

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