Section: Orthopedics

Original Research Article

TO ASSESS THE FUNCTIONAL OUTCOME OF MID-SHAFT CLAVICLE FRACTURE TREATED BY PLATE OSTEOSYNTHESIS IN TERM OF UNION, RANGE OF MOTION, PAIN OUTCOME, INFECTION AND EARLY FUNCTIONAL RETURN OF THE LIMB

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Received : 26/10/2023
Received in revised form : 02/12/2023
Accepted : 18/12/2023

Keywords:
Mid-shaft clavicle fracture, Plate osteosynthesis, Union, Motion, Pain, Limb.

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DOI: 10.47009/jamp.2023.5.6.225

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (6); 1099-1108

Abstract

Background: The clavicle is a bone that connects the thorax to the shoulder and facilitates mobility at the shoulder joints. The bone undergoes ossification before any other long bone in the body. Clavicle fractures are the prevailing fractures in the upper limb. **Aim:** To assess the functional outcome of mid-shaft clavicle fracture treated by plate osteosynthesis in term of union, range of motion, pain outcome, infection and early functional return of the limb. **Materials & Methods:** A Quasi experimental study was done in Regional Institute of Medical Science, Department of Orthopaedics from August 2019 to August 2021. Patients with mid shaft displaced clavicular fracture attending the out patients department of orthopaedics, were included if the following inclusion criteria were fulfilled. **Results:** In the present study 11 cases (68.8%) had constant murley score in the range of 91-94 and 1 case (6.3%) less than 90 and 15 cases (93.8%) had excellent result and 1 case (6.3%) had good. In the present study Robinson classification were used to classify a fracture which comes under inclusion criteria. Of these 12(75%) patients had type 2b1 and 4(25%) patients had type 2b2. **Conclusion:** Mid-shaft clavicular fractures with displacement more than 2 centimetres should be treated with ORIF with plating. This approach is necessary to ensure proper healing, minimise misalignment, avoid neurological problems, expedite the return to regular activities, and provide a visually satisfactory collarbone appearance, particularly for young girls.

INTRODUCTION

The The name Clavicle is derived from the Latin word clavis (key), the diminutive of which is clavicula, a reference to musical symbol. The clavicle is the only bony attachment between the trunk and the upper limb. It is palpable along its entire length and has a gentle S-shaped contour, with the forward-facing convex part medial and the forward-facing concave part lateral. The acromial end of the clavicle is flat, whereas the sternal end is more robust and somewhat quadrangular in shape. Although designated as long bone, the clavicle has no medullary cavity. It is the first bone in the body to ossify. It ossifies from two primary centres and one secondary centre. Two primary centres appear in the shaft between the fifth and sixth weeks of intrauterine life, and fuse about the 45th day after birth. The secondary centre for medial end appears during 15-17 years, and fuses with the shaft during 21-22 years. It serves as a movable, crane like strut from which the scapula and free limb are suspended, keeping them

ISSN (O): 2687-5365; ISSN (P): 2753-6556

away from the trunk so that the limb has maximum freedom of motion and strut is movable and allows the scapula to move on the thoracic wall at the scapulothoracicjoint, increasing the range of motion of the limb. Its forms one of the bony boundaries of the cervico-axillary canal, giving protection to the neurovascular bundle supplying the upper limb.[1,2]

Fracture of the clavicle is common due to its subcutaneous and anterior position, its account for 2-6% of all fractures and 80% of these fractures are in the middle third of the bone, where the typical compressive forces applied to the shoulder and the narrow cross section of the bone combines and result in bony failure.

Displaced mid shaft clavicle fractures are common and are generally treated non operatively by most of the physician. Non-operative treatment of these fractures with axial shortening is led to non-union, delayed union, and symptomatic malunion. Other complications are severe pain, neurological complications, loss of shoulder function and protuberant callus forming swelling and stretching of skin which is cosmetically unacceptable.

The proponents of early fixation of fresh clavicular fractures to prevent complications like malunion and non-union emphasize the value of accurate reduction and rigid fixation in affording quick pain relief and promoting early functional recovery. Persons with high activity level will hesitate to accept prolonged recovery and impaired shoulder function, therefore may require more aggressive treatment of middle third clavicle fractures. Prompt fixation of these clavicle fractures permits increased patient comfort, and early shoulder mobility. If the patients have high physiological demands shortly after surgery, high pain scores, or strong preference for surgery early plate fixation can offer advantages. In cases of associated scapula fractures, fixation of the clavicle provides restoration of shoulder mechanics leading to improvement of function. Operative treatment of displaced mid shaft clavicular fractures can be achieved successfully using plates or intramedullary implants like rush pins, Kirshner wires or nails. Open reduction and internal fixation with plating provides rigid fixation, early functional recovery and low rates of non-union and mal union.[3,4,5]

MATERIALS AND METHODS

A Quasi experimental study was done in Regional Institute of Medical Science, Department of Orthopaedics from August 2019 to August 2021. Patients with mid shaft displaced clavicular fracture attending the out patients department of orthopaedics, were included if the following inclusion criteria were fulfilled. The approval was sought from the research ethics board Regional Institute of Medical Science.

Inclusion Criteria

1. A completely displaced (>2cms) mid shaft fracture of the clavicle (derived by the clinical measurement)
2. A comminuted middle third fracture of the clavicle with inferior cortical defect.
3. A clavicular fracture associated with scapular neck fracture (floatingshoulder)
4. Painful nonunion
5. An age between eighteen and sixty years
6. No medical contraindication to general anaesthesia
7. Patient is willing to participate

Exclusion Criteria

1. Pathological fracture
2. A fracture in the proximal or distal third of the clavicle
3. Undisplaced or minimally displaced clavicle fracture

Methodology

Under general Anaesthesia the patient is placed in supine position with the sand bad between the scapulae or a folded towel under the affected shoulder, this allows the shoulder girdle to fall backward. It restores the length and increases the exposure to the clavicle. the entire extremity is prepared and draped so that the arm is freely movable. the incision 5-10cm in length is made over the anterior superior aspect of clavicle. subcutaneous tissue along the platysma incised together and is mobilized. This prevent wound healing related issues and implant prominence after wound closure. Myofascial layers is incised and elevated from the fracture end for proper exposure. after that fracture ends cleared of haematoma, bones is reduced using bone clamp but if comminuted wedge fragment, its fixed with a lag screw, reconstruction or anatomical plate is used and its contoured accordingly. the plate is placed in superior surface of clavicle. once the fracture alignment, length and rotation is satisfactory the screws is inserted. Minimum six cortical purchases are attained on either side of fracture. The myofascial layer followed by skin and subcutaneous tissue sutured and immobilized in universal shoulder immobiliser, rehabilitation of the affected arm is started at 5th day of post-operative day onwards. Gentle pendulum exercise to the shoulder in the arm pouch is allowed. at 2 to 3 weeks gentle active range of motion of shoulder is allowed but abduction is limited to 80 degrees. After 6 weeks active range of motion in all planes is allowed. The result will be analysed at the end of the follow up according to a modification of the criteria laid down by Baird and Jackson scoring system.

Statistical Analysis

Data was checked for completeness and consistency. Data was entered and analysed using SPSS V.21 for Windows (IBM Inc). Student-t test or Chi Square test was used for analysis. Descriptive data was presented using percentage and proportion for variables like sex, occupation, etc. and in terms of mean and standard deviation for variables and functional outcome using with patient factor.

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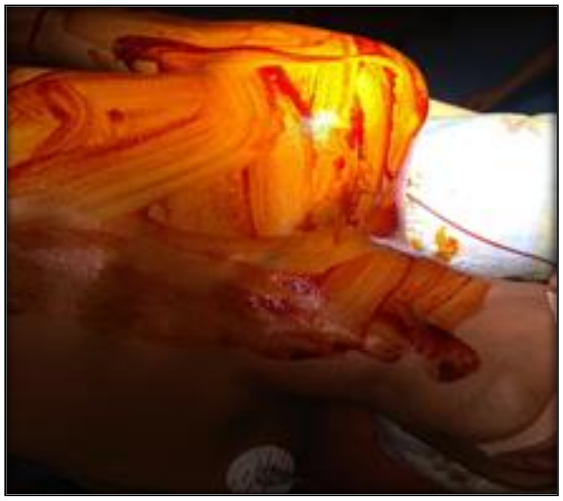

Figure 1: Skin preparation of the operated site with 10% betadine solution

Figure 2: Drapping and marking of the incision site

Figure 3: Incision given over the marked area

Figure 4: Dissection of the skin, subcutaneous tissue and supraclavicular nerve

Figure 5: Reduction of the bone in anatomical position and application of the plate

Figure 6: Fixation of the bone and insertion of screw

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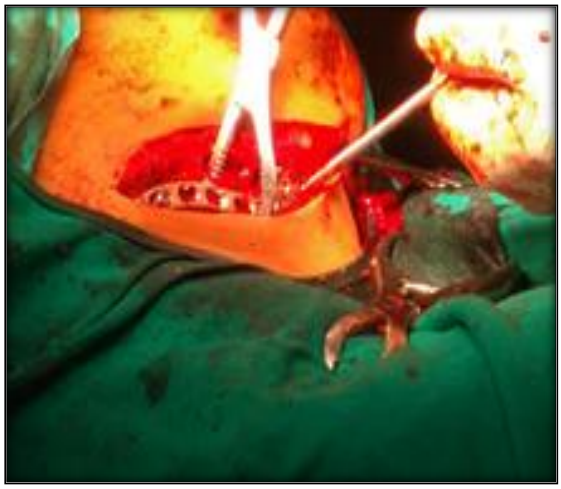

Figure 7: Screw fixation

Figure 9 B: Implants used in clavicular fracture

Figure 8: Fixation of the plate

Figure 10: Pre-operative x-ray

Figure 9A: Impalants used in clavicular fracture

Figure 11: post-operative x-ray

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Figure 12 A: Rom at 10 weeks post operation

Figure 12 B: Rom at 10 weeks post operation

Figure 12 C: Rom at 10 weeks post operation

Figure 12 D: Rom at 10 weeks post operation

Figure 13: Post-operative skin infection scar

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Figure 14: Post-operative delayed union at 15 weeks

RESULTS

A total of 16 patients who had displaced mid-shaft clavicular got treated with ORIF and Plating were included in the study as per the inclusion. In the present study 6 (37.5%) cases were 18-30 years old, 5 (31.3%) cases were 31-40 years old and 1 (6.3%) of 41-50 years age group and 4 (25%) of age groups 51-60 years old. The mean age with standard deviation were 35.56± 12.40. There were 10 (62.5%) males and 6 (37.5%) females in the present study. Ratio of males to females was 1.6:1 in our study. In the present study road traffic accident (RTA) was the commonest mode of injury accounting for 10(62.5%) cases, accidental fall account for 5 (31.3%) cases and sports injury account for 1(6.3%) of the cases. In the present study fall in outstretched hand accounts for 9 (56.3%) cases of all the mechanism of injury, direct impact on shoulder account for 7 (43.8%) cases out of 16 patients. In the present study 10 cases (62.5%) affected side were right hand and left-hand accounts for 6 (37.5) cases. [Table 1]

In the present study Robinson classification were used to classify a fracture which comes under inclusion criteria. Of these 12(75%) patients had type 2b1 and 4(25%) patients had type 2b2 as shown in. [Table 2]

In the present study 14(87.5%) out of 16 patients did not have any associated injury. 1 (6.3%) had right distal radius fracture and another 1(6.3%) had ribs and ankle fracture. The mean interval between injury and surgery in our study were 6.62 with SD of ±2.75 days.in our study, we had 7(43.8%) cases for whom we operated at less than 6 days. 8(50%) had been operated between 6-10 days from the time of injury. 1(6.3%) had been operated after 11 days from the time of injury due to other associated injury and local complication. In the present study 13(81.3%) cases out of 16 patients stayed at hospital more than 7 days after the surgery. 3(18.8) cases remained at the hospital for 3-7 days. In the present study 50% of the cases (8) returned to normal activities in 11-15 weeks of operation. 6 cases (37.5%) returned to work in 5-10 weeks and 12.5% (2) returned to work in 16-20 weeks as shown in the. [Table 3]

In the present study 56.3% of the cases (9) showed bone union clinically and radiologically at 5-10 weeks.6 cases (37.5%) showed union at 11-15 weeks and 1 case (6.3%) showed delayed union at 16-20 weeks as shown in the. [Table 4]

In the present study out of 16 cases only 1 case (6.3%) had superficial skin infection at the surgical site as shown in the. [Table 5]

In the present study 1 case (6.3%) had hardwire irritation, 1case (6.3%) had delayed union, 1 case (6.3%) had malunion and 1 case (6.3%) had restriction of shoulder movement as shown in. [Table 6]

In the present study 11 cases (68.8%) had constant murley score in the range of 91-94 and 1 case (6.3%) less than 90 as shown in the table 7 and 15 cases (93.8%) had excellent result and 1 case (6.3%) had good as shown in the. [Table 8]

In the present study the minimum age were 18 years and maximum of 56 years with the mean age of 35.56 years with the standard deviation of 12.42. Time interval of operation with minimum days of 14 days with mean days of 6.63 days and standard deviation of 2.75. The duration of hospital stay were 7 days of minimum and 15 days of maximum with mean days of 9.75 and standard deviation of 2.35. The 8 weeks of minimum period were required to return to normal work and 16 weeks of maximum period with mean of 11.63weeks and standard deviation of 2.75. In the present study minimum period of 7 weeks were required for bone to united and maximum of 16 weeks, mean of 10.50 weeks and standard deviation of 2.34. In the present study the case were followed and analysed with the Constant and Murley Score, minimum of 83 and maximum of 98 with mean of 95.19 and standard deviation of 3.56 were observed as shown in. [Table 9]

Table 1: Basic profile of the participants

Age in years	No of patients	Percentage
18-30	6	37.5
31-40	5	31.3
41-50	1	6.3
51-60	4	25.0
Total	16	100
Gender		
Female	6	37.5
Male	10	62.5
Mode of injury		
RTA	10	62.5
Accidental fall	5	31.3

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Sports injury	1	6.3
Mechanism of injury		
Direct impact to shoulder	7	43.8
Fall in outstretched hand	9	56.3
Side affected		
Right	10	62.5
Left	6	37.5

Table 2: type of fracture distribution

Robinson classification	No of patients	Percentage
Type 2b1	12	75
Type 2b2	4	25
Total	16	100

Table 3: Time interval from injury to surgery, duration of hospital stays and returns to work

Time interval of operation in days	No of patients	Percentage
1-5	7	43.8
6-10	8	50
11-15	1	6.3
Total	16	100
Duration of hospital stays in days		
1-2	0	0
3-7	3	18.8
>7	13	81.3
Return to work in weeks		
5-10	6	37.5
11-15	8	50
16-20	2	12.5

Table 4: time of union in weeks

Time of union in weeks	No of patients	Percentage
5-10	9	56.3
11-15	6	37.5
16-20	1	6.3
Total	16	100

Table 5: infection in the studied patient

Infection	No of patients	Percentage
Nil	15	93.8
Present	1	6.3
Total	16	100

Table 6: complication/issues in the studied patient

Variables	No of patients	Percentage
Plate loosening	**0**	**0**
Plate breakage	0	0
Hardwire irritation	1	6.3
Delayed union	1	6.3
Malunion	1	6.3
Restriction of shoulder movement	1	6.3

Table 7: Constant and Murley Score in the studied patient

Constant and Murley Score	No of patients	Percentage
<90	1	6.3
91-94	4	25
>94	11	68.8
Total	16	100

Table 8: interpretation of Constant Murley score in the studied patient (N=16)

Results	No of patients	Percentage
Excellent	15	93.8
Good	1	6.3
Total	16	100

Table 9: descriptive statistics in the studied patient

Variables	Minimum	Maximum	Mean	Standard deviation
Age in years	18	56	35.56	12.42
Time interval of operation in days	4	14	6.63	2.75

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Duration of hospital stays in days	7	15	9.75	2.35
Return to work in weeks	8	16	11.63	2.75
Time of union in weeks	7	16	10.50	2.34
Constant and Murley Score	83	98	95.19	3.56

DISCUSSION

Clavicle fractures are treated conservatively in most of the cases earlier. In the study conducted to analyse the closed treatment of middle third fractures of the clavicle by Hill JM, MC Guire MH, Cross by LA,[7] in 1997, Naveen BM, Joshi GR, Harikrishna B,[4] management of mid-shaft clavicular fracture : comparison between non-operational treatment and plate fixation in 60 patients in 2017 found poor results following conservative treatment of displaced midshaft clavicular fracture. In the present study with midshaft clavicle fracture is compared with Debnath S, Debbarma S and Reang S,[2] Panse JB et al,[8] and Dhoju et al,[9] where patients were treated with open reduction and internal fixation with plate and screws. Mid shaft displaced clavicle fracture occurred between the age group of 18 to 30 years in 6 patients (37.5%) in the present study. The minimum age of 18 years and maximum of 56 years with the mean age of 35.5 years and SD of 12.42 in the present study as comparable to following studies in Dhoju et al9 study patient average age was 31.5 years with the SD of 11.5 years, 15 years being the youngest and oldest age being 60 years. In Lee JK et al,[3] study patient average age was 30 years and minimum age of 14 years and maximum age of 68 years in the analysis of contoured anatomical plate fixation versus intramedullary rod fixation for acute midshaft clavicle fractures. In Fridberg et al,[10] study locking plate osteosynthesis of clavicle fracture: complication and reoperation rates in 104 consecutives cases the mean age was 36 years (14-75 years). In the present study mid shaft clavicle fracture occurs in 10 males (62.5%) and females 6(37.5%) comparable to Mohammed E et al,[11] study of functional outcome of midshaft clavicular fracture fixation utilising a reconstruction plate constitute 40% females and 60% males. In Panse JB, Lakhotia A, Nawale B, A Prospective study of clinical and functional outcome of clavicle fracture treated with locking plate 27 (90%) were male and 3(10%) were females. In Patel YC, Hasan AN, Thakkar PH,[12] study of results of clavicle fracture treated with clavicle plating in adults according to DASH Score in 20 cases 90% constitutes males and 10% females.

In the present study RTA account for 62.5% (10 cases), Accidental fall 5 cases (31.3%) and sports injury accounts for 1 case (6.3%) as comparable to following studies Panse JB, Lakhotia A, Nawale B,[8] A Prospective study of clinical and Functional outcome of clavicle fracture treated with locking plates in adults in adults RTA and accidental fall accounts 50%. Kholi S, Vishwakarma N, Chauhan S, Salgotra K,[13] study non-union clavicle fracture treated with Anatomical locking plate RTA constitutes 22% and fall accounts for 88%.

In the present study the fall in outstretched hand accounts 56.3% (9 cases) and direct impact to shoulder 7 cases (43.8%) as compared to Kholi S, Vishwakarma N, Salgotra K,[13] accounts 88% in outstretched hand.

In our study right sided fracture account for 10 cases (62.5%) and left 6 cases (6%) out of total 16 patients examined as comparable to the following studies. In S Kumar et al,[14] analysis of displaced middle third clavicle fracture treated by plate osteosynthesis 28 cases (70%) were right sided clavicular fracture and 12 cases (30%) were left sided clavicle fracture out of 40 cases. In Behera BK, Sahu S,[15] Outcome of comminuted middle third clavicular fracture treated with open reduction and internal fixation with plating 15 cases (24.19%) were left sided clavicle fracture and 47 cases (75.80%) right sided out of 62 patients examined.In the study of Panse JB, Lakhotia A, Nawale B,[8] 19 patients (63.3%) were left sided clavicle fracture whereas 11 patients (36.7%) had clavicle fracture in the right side out of 30 cases.

In the present study Robinson Classification was used and type 2b1 constitute of 12 cases (75%) and type 2b2 constitutes of 4 cases (25%) out of 16 cases as comparable to the following studies. In the Robinson CM6 Fracture of the clavicle in the adult Epidemiology and classification a consecutives series of 1000 fracture of the adult clavicle, in the study they concluded that type 2b1 accounts 28.9% and type 2b2 constitutes 25.5%. In Cho et al,[16] study in reconstruction plate group there were 7 patients with type 2b1 and 12 patients with type 2b2 and that of the locking compression group had 9 type 2b1 and 13 type 2b2.

In the present study 2 cases (one with ipsilateral right distal radius fracture and another with multiple ribs fracture and ipsilateral ankle fracture) 12.5% were associated injury along with mid shaft clavicle fracture as comparable to following studies. In the Onta PR et al,[17] study of treatment of midshaft clavicle fracture with anatomical contoured clavicle locking plate 5 cases (16%) had associated injuries with 1 patient had ipsilateral distal radius fracture, 1 case had distal radius fracture and 1 case had ipsilateral fracture of shaft of humerus. In Naveen BM, Joshi GR and Harikrishnan B,[4] study of management of midshaft clavicular fracture: comparison between non operative treatment and plate fixation in 60 patients, group 1 6 cases (20%) had associated injury and in group 2 8 cases (26.6%) had associated injury. In Mohammed E et al,[11] study of functional outcome of mid clavicular fixation utilising a reconstruction plate out of 34 patients 3 patients (8.82%) had associated injury.

In the present study the 50% of the cases (8 cases) out of 16 patients underwent operation within 6-10 days from admission, 7 cases (43.8%) underwent

ISSN (O): 2687-5365; ISSN (P): 2753-6556

operation at 1-5 days and 6.3% (1 case) had underwent 11-15 days of admission following associated problems as comparable with the following studies. In the Onta PR, Sapkota K, Wahengaonkar K, Ranjeet N, Thapa P, Thapa UJ,[17] study: treatment of midshaft clavicular fracture with anatomical locking contoured clavicular plate 90% of the patients were operated with 1-5 days of the injury. In Debnath S, Debbarma S, Reang S,[2] study: midclavicle fracture treayted by plate osteosynthesis, patients were operated with 1-5 days of injury and discharged after 14 days of stitch removal.

In the present study 81.3% (13cases) stayed for more than 13 days post-operative, 3 cases (18.8%) stayed for 3-7 days with the mean days of 9.75 and SD 2.277 as comparable to those studies. In the study conducted by Debnath S, Debbarma S, Reang S,[2] midclavicular fracture treated by plate osteosynthesis, patients were operated with 1-5 days of injury and discharged after 14 days of stitch removal (post-operative).

In the present study 8 cases (50%) returned to work in 11-15 weeks, 6 cases (37.5%) returned to work in 5-10 weeks and 2 cases (12.5%) returned to work in 16-20 weeks as comparable to those studies. In the study of Acar E, Toker S,[18] clavicular fracture in a national wrestler: A case report of rapid return to play, Athletes return to competition by 12 weeks treated with operative intervention. In Kumar S, Manohar TM, Pradobh C, Kamalanathan C,[9] Analysis of displaced middle third clavicular fracture treated by plate osteosynthesis, 24 patients (60%) returned to day-to-day activities after 2-3 weeks, 30 cases (75%) returned to work within 10 weeks.

In the study 9 cases (56.3%) had union at 5-10 weeks, 6 cases (37.5%) had union at 11-15 weeks and 1 case (6.3%) had delayed union at 16-20 weeks as comparable to those studies. In Verborgt O, Pittoors K,[19] study, the bone had united at 12 weeks. In Mohammed E et al,[11] study of functional outcome of mid clavicular fixation utilising a reconstruction plate on 34 patients the average time of bone union was 14 weeks. In Behera BK, Sahu S,[15] Outcome of comminuted middle third clavicular fracture treated with open reduction and internal fixation with plating the average time of bone union was 13 weeks (range of 12-14weeks), 3 patients (4.83%) had delayed union and united after 12 weeks.

In the present study 1 case (6.3%) had skin infection over the operated site out of 16 cases as comparable to those studies. In Mckee MD et al,[20] study 4.8% had wound infection at the operated site. In Lee JK, Ahlman ER, Wang L, Itamura JM,[3] study 4 cases (11.8%) had infection in the operated site. In Karthi MN, Premkumar TC, Kailash K,[5] Study prospective analysis of functional outcome of clavicle fracture treated by plate osteosynthesis, in their studies they had 10% post-operative wound infection.

In the present study we had come across 1 case (6.3%) with hard wire irritation, 1 case (6.3%) with delayed union, 1 case (6.3%) had mal union and 1 case (6.3%) had restriction in shoulder movement out of 16 cases that we studied as comparable to those studies. In Naveen BM, Joshi GR and Harikrishnan B,[4] study of management of midshaft clavicular fracture 2 cases (6.66%) from group 2 and hardwire prominence and irritation. In Karthi MN, Premkumar TC, Kailash K,[5] Study prospective analysis of functional outcome of clavicle fracture treated by plate osteosynthesis, they had encountered hardwire prominence and irritation in 5% of the patients. In Kumar S, Manohar TM, Pradobh C, Kamalanathan C,[9] Analysis of displaced middle third clavicular fracture treated by plate osteosynthesis, they had 1 case (2.5%) with hardwire irritation. In Behera BK, Sahu S15 Outcome of comminuted middle third clavicular fracture treated with open reduction and internal fixation with plating, they had 3 patients (4.83%) they underwent delayed union after 3 months which eventually got united without any intervention. In Kumar S, Manohar TM, Pradobh C, Kamalanathan C,[9] Analysis of displaced middle third clavicular fracture treated by plate osteosynthesis, one case (2.5%) had delayed union. In the Robinson CM,[6] Fracture of the clavicle in the adult Epidemiology and classification a consecutives series of 1000 fracture of the adult clavicle, delayed union was defined as healing between 12 weeks and 24 weeks, type 2b1 had 8 cases (2.1%) with non-union and type2b2 had 8 cases (6.3%) in the study.

In the present study 11 cases (68.8%) had Constant and Murley Score more than 94%, 4 cases (25%) had Constant Murley Score between 91-94 and 1 case (6.3%) had less than 90 Constantb and Murley Score with mean of 95.19 and SD of 3.56 as comparable to those studies.15 patients (93.8%) had excellent score and 1 case (6.3%) had good score. In Kwthi MN, Prem kumar TC, Kailash K,[5] study 85% of patient had Excellent grade 3 cases had below 90 Constant and Murley Score. In Debnath S, Debbarma S, Reang S2 study: midclavicular fracture treated by plate osteosynthesis, 17 cases (56.67%) had Excellent Constant and Murley Score, 9 cases (30%) had good, and 4 cases (13.33%) had Fair Score. In Mohammed E et al,[11] study of functional outcome of mid clavicular fixation utilising a reconstruction plate on 34 patients, the average constant score 95.33 with SD of 3.4 in one year follow up. In Patel YC, Hasan AN, Thakkar PH,[12] study of results of clavicle fracture treated with clavicle plating in adults according to DASH Score 10% had Excellent, 85% had Good and 5% had Poor Constant and Murley Score. In Dhoju D, Shrestha D, Parajoli N, Shrestha R, Sharma V,[9] study: operative fixation of displaced middle third clavicle (Edinberg type 2) Fracture with superior reconstruction plate osteosynthesis, the average Constant and Murley Score was 97.45 and SD of 3.1 in one year follow up.

CONCLUSION

Mid-shaft clavicular fractures with displacement more than 2 centimetres should be treated with ORIF

ISSN (O): 2687-5365; ISSN (P): 2753-6556

with plating. This approach is necessary to ensure proper healing, minimise misalignment, avoid neurological problems, expedite the return to regular activities, and provide a visually satisfactory collarbone appearance, particularly for young girls.

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ISSN (O): 2687-5365; ISSN (P): 2753-6556