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ASSESSMENT OF FUNCTIONAL OUTCOMES AFTER PLATE FIXATION OF CLAVICLE MIDSHAFT FRACTURE

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Background: Our study aims to investigate the union and functional outcome of plating-treated displaced clavicle fractures as well as the complications related to clavicle fractures and surgical therapy.

Methods:
From January 2024 to July 2024, we assessed 20 patients who had midshaft clavicular ftacture plating both prospectively and retrospectively. The information on potential instances has been gathered. Oxford shoulder score and radiological score were used to examine the data that was thus gathered.

Results: All fractures were fixed, and 15 patients (75%) had outstanding functional outcomes, 3 patients (15%) had good functional outcomes, and 1 patient (10%) had fair functional outcomes.
Four of the 20 patients had plate prominence, one had a hypertrophied skin scar, one had plate loosening,

one had delayed union, and one had a deep infection that was later exposed to the plate. Every patient was happy with the care they received.

Conclusion: we discovered that this method results in satisfactory fracture union by providing a firm stability of the fracture. Additionally, it helps to avoid shoulder stiffness by promoting early shoulder mobilization. Even in cases of extreme comminution, fracture approximation is possible due to open reduction. For fresh mid-shaft clavicle fractures, primary open reduction and internal fixation with plate and screws offer a firmer fixation and eliminate the need for prolonged immobilization. Their results are superior than those provided by traditional conservative.
According to this study, early primary plate fixation of mid-shaft clavicular fractures leads to better outcomes for patients and surgeons, an earlier return to function, and lower incidence of malunion and nonunion.

Keywords: Clavicle midshaft fracture, Plate fixation, Functional outcomes, Clavicle fracture treatment, Orthopedic surgery outcomes

INTRODUCTION

Because of its subcutaneous location, clavicle fractures are a common traumatic injury around the shoulder girdle in young, active people. The mode of injury is typically a direct strike, a high-velocity impact, or a fall onto the extended upper extremity.[1] Clavicle fractures make up around 2.6% of all fractures.[2], and 80–85% of them take place in the bone's midshaft.
[3, 4] The bone will occasionally fracture where it joins the shoulder blade or rib cage.
Because non-operative treatments reduce deformity, sagging shoulders, and shoulder weakness, they were linked to 15–20% non-union and 1% malunion.[7] For centuries, clavicle fractures were disregarded, despite the development of osteosynthesis.
Its distinctive "S" shape might have been the cause.[8] subcutaneous placement, closeness to important structures, or difficulty fixing because implants are unavailable, or it could be because of a little handicap following conservative therapy. The surgical scar across the clavicle in females also had cosmetic effects. The plate fixation has become more popular in recent years because it provides a good, stable fixation, allowing for early shoulder mobilization and an early return to work. [9]

However, there are currently no definitive standards for operating on clavicle fractures, and there is ongoing debate. For this reason, I decided to expand this study in order to better understand the functional outcomes and issues that arise following the repair of mid-shaft clavicular fractures.
Goals and Objectives
1. To investigate the union and functional outcomes of plating-treated dislocated clavicle fractures.
2. To research clavicle fracture consequences and surgical treatment for them

METHOD AND MATERIAL

Place of Study
The study was carried out at GMCTH Gujranwala's Department of Orthopaedics.
Study type
The study, which was conducted at GMCTH's Department of Orthopaedics, is both prospective and retrospective.

Sample Size
All consecutive patients who met the eligibility requirements during the research period have been enrolled because this is an observational study.The retrospective group consists of twenty subjects that have had prior surgery. Since we were unable to locate enough prospective instances to satisfy the sample size criterion, we included retrospective cases.

Inclusion Criteria

1. Subjects must be older than eighteen.
2. Fractures of the displaced midshaft.
3. Fractures that are closed.

Exclusion Criteria
1. Age < 18 years.
2. Fractures that are open
3. Related neurovascular or head injuries.
4. Proven non-union from an earlier fracture.

Study methodology
In the Department of Orthopedics at GMCTH Gujranwala, a prospective and retrospective study has been carried out. This study analyzed 20 patients who were admitted with a displaced midshaft clavicle fracture and treated with plating. The hospital's record section and radiological department provided the data for the retrospective instances.
The x-rays and files were gathered. These patients were called and requested to bring their old records for the most recent radiological and clinical tests. Information about the patient's follow-up and deficiencies. The Oxford shoulder score [ANNEXURE-2] and the radiological score [ANNEXURE-3] were used to analyze the data that was thus gathered.

RESULTS:
In this study, 20 patients with comminuted mid-shaft clavicle fractures were treated surgically between January 2024 and July 2024 using plating and screws. Every six weeks, all of the patients were monitored and were accessible for follow-up. The findings were examined using both clinical and radiological methods.

Cause of Injury
Ten patients (50%) had mid-shaft clavicle fractures as a result of falling on their shoulder from a two-wheeler, five patients (25%) had traffic accidents, and five patients (25%) had assaults.

Age Incidence
There is almost equal distribution in all age group of the patients with Mid Shaft Clavicle Fracture i.e. 10 patients (50%) in the age group of 20-29 years, 6 patients (30%) in the age group of 30-39 years, 4 patients (20%) in the age group of 40-49 years. The youngest patient was 20 years, and oldest patient was 48 years. The average patient age was 38 years.

Comminution
Plain radiograph of clavicle with shoulder is taken in anteroposterior view to assess the site of fracture and the type of fracture (like Displacement, Angulation, Comminution). In this present study there were 20 patients (100%) of mid shaft clavicle fracture where 10 patients (50%) were having comminution at fracture site and 10 patients (50%) were having simple fracture pattern without any comminution. All the

patients in mid shaft clavicle fracture were closed type. There were no associated medical illness in any patient

Major complication

A serious complication was defined as one that necessitated inpatient care and caused an extra morbidity of two months or more.

Five patients (30%) had plate prominence in the repair of a mid-shaft clavicle fracture. At 8 weeks after surgery, a severe infection arose in 1 patient (4%) and the plate was exposed at 10 weeks, at which point the implant was removed.

Types	Number
Hypertrophic skin scar	5
Plate prominence	1
Infection (deep) & Exposed plate	1

Functional Outcome

The functional outcome is assessed by Oxford Shoulder score. In this study all of the 20 patients (100%) with Mid Shaft Clavicle Fracture had excellent functional outcome.

Functional outcome Total -48 points	Frequency
Excellent	20
Good	0
Fair	0

Radiographic Outcome

In midshaft clavicle fracture treated surgically with plating, 18 patients (90%) united with radiographic grade1 and 2 patients (10%) united with radiographic grade-2.

Radiographic score	Frequency
Grade 1	18
Grade 2	2
Grade 3	0
Grade 4	0

DISCUSSION

Conservative treatment is typically used for clavicle fractures.

A study by Hill et al. [7] in 1997, Nordqvist et al. (1998), and Robinson et al. (2004) that examined the outcomes of conservative therapy for displaced middle third clavicle fractures revealed subpar outcomes. According to Edwards et al. (1992), conservative treatment of displaced lateral third clavicle fractures had a higher rate of nonunion and residual shoulder impairment.

In this investigation, we evaluated and contrasted our findings with those of related previous studies on surgically repaired midshaft clavicle fractures using plating.

Mechanism of injury
The way that harm is caused
Eight patients (27.6%) in our study of mid-shaft clavicle fractures had them as a result of a two-wheeler fall on their shoulder, 19 patients (65.5%) had them as a result of a traffic accident, and two patients (6.8%) had them as a result of attack.
This is analogous to Tsang et al.'s similar investigations.[58], where 74% of patients had RTA, 8 patients had fallen, 7 patients had sports injuries, and 6 patients had fallen from a height; Dhoju et al. (55), where 50% of patients had RTA, 45% had fallen from a height, and 5% had been assaulted by buffalo; Battacharya et al. [61], where 50% had RTA and 50% had suffered a sporting injury or direct violence; and Kulshrestha.[51], of which 75%

Age Incidence
The distribution of patients with mid-shaft clavicle fractures in the study is nearly equal across all age groups, with 10 patients (34.5%) in the 20–29 age group, 7 patients (24.1%) in the 30-39 age group, 4 patients (13.8%) in the 40–49 age group, and 8 patients (17.6%) in the 50+ age group. The oldest patient was 69 years old, and the youngest was 20. 38 was the average age of the patients.
The average age in the studies by Tsang et al. [58], Dhoju et al. [55], Battacharya et al. [61], and Kulshrestha was 45, 31.5, and 36.5 years, respectively.[51] According to the survey, the average age was 31.

Functional outcome:
Of the patients in this study of mid-shaft clavicle fractures, 15 (75%) had outstanding functional outcome, 3 (15%) had good functional outcome, and 1 (10%) had fair functional outcome.
A comparable study by Tsang et al. (58) found that 78 patients (95%) recovered without any problems and had an average DASH score of 26.35.
In a one-year follow-up, the average Constant Score in the Dhoju et al. [55] trial was 97.4 with SD 3.1, and all patients expressed a reasonable level of satisfaction with the process.
According to the Rowe Criterion, 12 patients (60%) in the Kulshrestha trial had exceptional results, 6 patients (30%) had good results, and 2 patients (10%) had fair results.

Radiolographic Outcome
Eighteen patients (90%) had fractures joined with radiographic grade-1 in this study, while two patients (10%) had fractures united with radiographic grade-2. All patients had acceptable union.
1.2% of patients in the Tsang et al. [58] research experienced nonunion, and the average time to radiographic union was 11.2 weeks.
No nonunion or implant failure was noted in the Dhoju et al. [55] investigation.
Two patients (7.1%) experienced nonunion in the Battacharya et al. [61] research, and the average time to union was ten weeks.

CONCLUSION
This study examines 20 cases of midshaft clavicle fractures that were surgically treated with plate fixation at the GMCTH Gujranwala Department of Orthopaedics between January and July of 2024.
Participants in this study had to be at least 18 years old, and their ages ranged from 20 to 69.
38 was the average age of the patients.
The majority of the patients' fractures were caused by RTAs and falls from two-wheelers. More often, men are impacted.
Surgery was performed on 18 patients (80%) in the first week and on 2 patients (10%) beyond the first week. Fifteen patients had displacement with communication and five patients had displacement without communication as the rationale for surgery in middle third clavicle fractures.

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