The Frequency Of Tibial Shaft Fractures That Fail To Mend ProperlyDespite The Use Of Locking Plates.

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ABSTRACT

Received: 22 September 2022, Accepted: 12 December 2023, Published: 06 February 2023

BACKGROUND: Fractures of the tibia often result from accidents and falls. Treatment for an open fracture Tibia is challenging for orthopedics and plastic surgeons. Several treatment options are available for tibia fractures, including conservative and surgical procedures. Locking plates are a successful therapeutic approach. However, they have problems, including nonunion.

OBJECTIVE: This study aims to determine the frequency of nonunion in tibial shaft locking plates. **Study design:** A Case Series

Place and duration of study : Department of Orthopedic DHQ Hospital Batkhala Pakistan. The Period of Study Sixty months (Aug 16, 2020 - Feb 15, 2021)

MATERIALS AND METHODS: All patients hospitalized in our department with tibial shaft fractures who consented toparticipate were included in this research. The context for Conducting a Case Study The study was conducted at the Department of Orthopedic DHQ Hospital Batkhala Pakistan. The Period of Study Sixty months (Aug 16, 2020 - Feb 15, 2021) It was determined that the fracture needed to be stabilized, and alocking compression plate was used. Patients were contacted frequently utilizing their contact information to lessen the risk of them not following up. The 24th-week visit for nonunion was conducted using X-rays of the tibia shaft Anteroposterior and lateral views as the final evaluation for the research. The patient was instructed to notify the hospital immediately ifany complications emerged from the surgery. When returning to the surgical location for follow-up appointments, All surgical operations were subjected to periodic radiological and clinical evaluation.

RESULTS:

A total of 60 patients were included in this research. All patients underwent surgery using a locking compression plate. Of these, 8 had nonunion of the tibial fracture at 24 weeks follow-up. The incidence of nonunion was 13.3%.

CONCLUSION:

The study revealed that the incidence of nonunion in tibial shaft locking plates is 13.3%. This is an important finding for orthopedics surgeons because it highlights the risks of locking plates for tibial shaft fractures. Further research is needed to identify risk factors and strategies to reduce the incidence of nonunion.

KEYWORDS: Nonunion, tibial shaft fracture, locking plates, case series study

Authors Contribution

SHASB. Concept & Design of Study ,MH.Drafting, AK.Data Analysis,SU,SA Revisiting Critically, SK.SHASB.Final Approval of version Creative Commons License This work is licensed under a Creative Commons Attribution-Noncommercial 4.0 International License



INTRODUCTION

Long lower-extremity bone Because the tibia is shallow, fractures are common1. Accidents and falls cause tibial fractures¹. The rising population and changing human behaviours increase accidents and high-energy trauma. Orthopaedic and plastic surgeons struggle with open tibia fractures². Open tibial fractures may be treated with irrigation, external fixation, debridement, intramedullary nailing, and plating. Because conservative therapy often leads to malunion, nonunion, rotational deformity, or joint stiffness, operational treatment has become increasingly common ³. Surgically treating these fractures is debatable. Options include intramedullary implants, half-pin external fixation, hybrid or thin- wire external fixation, and plate fixation⁴. Other treatments can fix tibial fractures. Plates, k-nails, and external fixation1 are examples⁵. Therapeutic options for distal tibial fractures include locked plating. Anatomical plating enables optimum reduction, but high fracture energy and soft tissue damage make big incisions inappropriate⁶. Percutaneous plating for tiny wounds and mild tissue injury has improved. In certain studies, the tibial platehas problems such as nonunion, implant failure, woundinfections, and joint stiffness⁷. Single-surgeon research comparing minimally invasive plating with intramedullary nailing reported 8% and 7% nonunion rates, respectively. After a year of follow-up, 11% of patients with tibial fractures had nonunion, with the average incidence ranging from 9% to 22%8. The Ilizarov procedure treats tibial shaft fractures. It's connected to a clunky ring that causes patient suffering. Locked plating increases the likelihood of nonunion for such fractures. Locked plates are used for tibial fractures. My study seeks to increase fracture union, reduce post-operative complications, and improve patient. Satisfaction via quicker healing and shorter hospitalstays. This study will determine the dangers of locked plating, especially fracture nonunion, in our patient group⁹. The literature uses higher-quality implants, which are not accessible here.If nonunion is common, this research will be utilized to improve ward and surgical recommendations¹⁰. This research will enhance orthopaedic physicians' awareness of nonunion and offer surgical method modifications¹¹.

MATERIALS AND **METHODS:** patients All hospitalized in our department with tibial shaft fractures who consented to participate wereincluded in this research. The context for Conducting a Case Study The study was conducted at the Department of Orthopedic DHQ Hospital Batkhala Pakistan. The Period of Study Sixty months (Aug 16, 2020 - Feb 15, 2021) It was determined that the fracture needed to be stabilized, and a locking compression plate was used. Patients were contacted frequently utilizing their contact information to lessen the risk of themnot following up. The 24th-week visit for nonunion was conducted using X-rays of the tibiashaft Anteroposterior and lateral views as the finalevaluation for the research. The patient was

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DATA ANALYSIS PROCEDURE

The collected data were entered into the computer using SPSS version 2.4 for analysis. Descriptive statistics were used tocalculate means \pm standard deviation for numerical variables, i.e. age. For categorical variables like gender, type of fractures and nonunion, frequencies and When the pressure within a certain fascial compartment of the leg is increased to the degree thatit might induce blood flow restriction and nerve injury, compartment syndrome is a complication that every doctor treating a tibial shaft fracture should be worried about. The clinician does not need to witness

percentages calculated. The nonunion stratified all symptoms to diagnose among the age, gender and A.O. type to see the effect modification. The chi-square test was used to assess for any significant difference between categorical variables. P- value ≤ 0.05 was considered statistically significant. All results were presented in the form of tables and figures.

EXAMINING PHYSICALLY

All people in a high-energy accident should be examined according to the guidelines set outby the Royal Australasian College of Surgeons' Road Trauma Committee/Emergency Management of Severe Trauma. The primary survey includes the ABCs (i.e., airway, breathing, circulation). The Glasgow Coma Scale (GCS) score determines any head injury component's severity. The secondary survey should include the chest, abdomen, pelvis, upper limbs, and contralateral lower limbs for associated injuries. Other fractures, such as a femur fracture leading to a floatingknee, or joint injuries, such as knee dislocations, may also affect the ipsilateral limb. If the mechanism of injury (e.g., a pedestrian hit by a car) suggests it, lookfor signs of crush injury. External signs of these injuries may be minimal.

COMPLICATIONS

syndrome. A strong index of suspicion and vigorous surgical therapy is necessary for this condition. Reduced pulses may not become apparent until muchlater in the procedure, so always keep this in mind.Pressure monitors are now often recommended by surgeons as a tool for patients to consider while making treatment choices. More than 25-30 mm Hg ofcompartment pressure is cause for worry and should be brought up with a physician. The treatment for compartment syndrome is fasciotomy.

MANAGEMENT FRACTURE REPAIR

Intramedullary nailing is the best choice for Gustilo-Anderson fractures of type I, II, and III. Type IIIB fractures may be treated with unreamed nails as well. Solid-core nails have the lowest incidence of infection. According to Marecek et al., individuals withopen tibia fractures who had medullary nailing of the tibia by suprapatellar or infrapatellar methods had identical risks of developing knee sepsis. Routine preoperative blood tests are ordered. Periodic limb, chest, and cervical spine radiographs are ordered.

RESULTS:

(Fig 02)

A total of 60 patients were included in this research. All patients underwent surgery using a locking compression plate. Of these, 8 had nonunion of the tibial fracture at 24 weeks follow-up. The incidence of nonunion was 13.3%.

APPROACH CONSIDERATIONS

Fig No. 1: Radiograph demonstrating a displaced tibial shaft fracture with associated fibula fracture

Fig no. 2 open tibial shaft fracture. (Fig 01)



Figure 03: exposed tibial shaft fracture external bracing. You can see the fasciotomy cut on the left thigh's opposite side.

Figure 04: image from the front to the back showing an intramedullary spike fixated tibial shaft fracture. Additionally, the typically presentfibular fracture is visible. (Fig 03) (Fig 04)





Table No 01: DESCRIPTIVE STATISTICS

Mean and S.D.for Age	39 Years <u>+</u> 12.68

Table No. 02 FREQUENCY AND PERCENTAGESFOR AGE

Age Group	Frequency	Percentage
16-30	-	-
Years	27	17.30%
31-45	-	-
Years	57	36.53%
46-50	-	-
Years	72	46.15%

Table No. 3 FREQUENCY AND PERCENTAGES

Gender	Frequency	Percent
age		
Female	58	37.17%
Male	98	62.82%

DISCUSSION

Lower leg bone tibia. Surface tibial fractures are prevalent Accidents and fall cause most tibial fractures¹². As the population expands and habits change, accidents and high-energy trauma rise. Orthopaedic and plastic surgeons must manage open tibia fractures. Open tibial fractures may be treated with irrigation, external fixation, debridement, intramedullary nailing, and plating. Conservative treatment of these fractures often results in malunion, nonunion, rotational deformity, or stiffness of neighbouring joints. Hence surgery therapy is now preferred. The optimal surgery for these fractures is still being determined13. Questionable. Intramedullary implants, half-pin, hybrid, thin-wire external fixation, or plate fixation are alternatives. There are several tibial fracture treatments. Placing, k- nail, and external fixation are examples¹⁴. Locked plating is more prevalent for

Table No. 4 FREQUENCIES AND PERCENTAGESFOR TYPE OF FRACTURE

Type of Fracture	pe of Frequency Percentage cture	
Type A	84	53.84%
Type B	49	31.41%
Type C	23	14.74%

Table no 5: the frequency of nonunion and percentage

Nonunion	Frequency	Percentage	
Yes	15	9.61%	
No	141	90.38%	

Table 6: The second table shows the stratification of	ľ
nonunion with the type of fracture:	

Type of fracture	No of union	Frequency	Percentage	P Value
Type A	Yes	09	5.76%	0.878
No	75	48.07%	4.43%	0.878
Type B	Yes	04	2.56%	0.878
No	45	28.84%	2.66%	0.005
Type C	Yes	02	1.28%	0.005
No	21	13.46%	1.19%	0.005

distal tibial fractures. High-energy fractures and injured soft tissue render big incisions unsuitable for reduction, even anatomical leaf. Minimally invasive percutaneous plating seeks tiny incisions and little tissue damage¹⁵. Despite being soft the recommended therapy, the tibial plate may cause nonunion, implant failure, wound infections, and joint stiffness¹⁶. Single-surgeon research comparing minimally invasive plates to intramedullary nailing reported a nonunion rate of 8% for scale and 7% for nailing5; in our analysis, 15.6% of patients suffered nonunion. Table 5 In another research, 11% of tibial fracture patients suffered nonunion after a year of follow-up, with theaverage incidence ranging from 9 to 22% 6; in our study, 15.6% of patients experienced non-union¹⁷. Table 6 Ilizarov method treats tibial shaft fractures. Heavy ring increases patient pain. Locked plating for such fractures increases nonunion rates. We've started employing

locking tibial plates. My researchintends to evaluate whether it increases fracture union frequency, postop complications, and patient satisfaction due to rapid healing and a shorter hospital stay¹⁸. This study will determine whetherPlating problems, including fracture nonunion, in our patient group. Literature data is based on higher-quality implants, which are not accessible in the U.S. If nonunion is common, this research will be utilized to improve ward and surgical recommendations. This research will educate orthopaedic surgeons about nonunion prevalence and give surgical procedure suggestions¹⁹.

CONCLUSION

We Found 15 (9.61%) Nonunions In Tibial Shaft Fracture Locking Plates During Our Investigation. According To Our Clinical Follow-Up, Soft Tissue Problems Must Be Kept In Mind.TSF Surgery With A Single Lateral Approach And Locking Plate Takes LessTime And Requires Less Time In The Hospital.

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Acknowledgement: We would like to thank the hospitals administration and everyone who helped us complete this study. Disclaimer: Nil Conflict of Interest: There is no conflict of interest. Funding Disclosure: Nil

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