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Study Of Merits And Demerits Of Tension Band Wiring In Various Fractures.

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ABSTRACT

This prospective study investigates the outcomes of tension band wiring in fractures of the Olecranon, Patella, or Medial Malleolus in 20 patients at SVS Medical College, Yenugonda, Mahabubnagar, spanning from September 2017 to August 2019. Using a convenient sampling technique, patients with isolated and displaced fractures were included, emphasizing standardized operative techniques. Results reveal a 100% absence of postoperative pain and complications, highlighting the efficacy of tension band wiring. The final outcomes showcase 55% classified as "Good" and 45% as "Excellent," affirming the technique's versatility and success across diverse anatomical sites. While these findings are promising, the study's limitations include a small sample size and short follow-up duration.

Keywords: tension band wiring, fractures, orthopaedics.

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INTRODUCTION

Tension band wiring (TBW) is a widely utilized surgical technique in the management of fractures, offering a unique approach to stabilize fractures by converting tensile forces into compressive forces. This method is particularly valuable in fractures that experience repetitive axial loading or tension forces. The inherent merits of tension band wiring include its ability to provide robust stability, promote early mobilization, and enable anatomical alignment. However, the technique is not without its demerits, as complications such as implant irritation, non-union, and the potential for hardware failure can arise. Understanding the nuanced application of tension band wiring in various fracture scenarios is crucial for optimizing patient outcomes. This study aims to comprehensively explore the merits and demerits of tension band wiring in diverse fracture types, shedding light on its efficacy, limitations, and potential refinements in clinical practice [1-7].

MATERIAL AND METHODOLOGY

In this prospective study conducted at SVS Medical College, Yenugonda, Mahabubnagar, a total of 20 patients undergoing tension band wiring for fractures of the Olecranon, Patella, or Medial Malleolus were enrolled. The study spanned from September 2017 to August 2019. Patients meeting the inclusion criteria, diagnosed with isolated and displaced fractures of the specified anatomical sites in the orthopaedics department, were included. Convenient sampling technique was employed for patient selection.

The inclusion criteria encompassed patients aged 17 years and above, of both genders, with isolated and displaced fractures of the patella, olecranon, or medial malleolus. Exclusion criteria ruled out individuals below 17 years of age, those with open or pathological fractures, and patients with comorbidities rendering them unsuitable for surgery. The study aimed to focus on a specific subset of fractures to ensure homogeneity within the sample, facilitating a more targeted analysis of the tension band wiring technique's effectiveness and drawbacks.

Operative techniques were standardized across the patient cohort. Depending on the fracture type, spinal anaesthesia was administered for patellar and malleolar surgeries, while regional block or general anaesthesia was employed for olecranon fractures based on the patient's condition. Patient positioning during surgery varied, with a supine position for patellar fractures and lateral positioning for malleolar and olecranon fractures. The application of a pneumatic tourniquet was consistent, with its placement on the arm for olecranon fractures and on the thigh for patellar and malleolar fractures following exsanguination. Preoperative preparation involved scrubbing, painting, and draping of the affected anatomical area. This detailed methodology ensured a standardized approach to the surgical procedures, enhancing the reliability and comparability of the study findings.

RESULTS

A longitudinal cohort study was conducted on 20 patients who are diagnosed as fractures of Olecranon or Patella or Medial malleolus in the department of orthopaedics at SVS Medical College and Hospital, among the total of 20 patients enrolled in this study, there were no deponents or loss to follow-ups.

The outcomes of the patients were evaluated clinically and radiologically on periodic basis. The Clinical evaluation was done using Goodfellow grading of range of motion for patella, American Orthopaedical Foot and Ankle.

Society - ankle – Hindfoot Scale for medial malleolus and Mayo Elbow Performance Score for olecranon.

Table 1: Distribution of patients based on associated injury

Associated Injury	Number	Percentage (%)
Yes	0	0
No	20	100
Total	20	100

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Table 2: Distribution of patients based on pain

Pain	Number	Percentage (%)
Present	0	0
Absent	20	100
Total	20	100

All the patients of this study did not have any postoperative complaint of pain at previously operated site.

Table 3: Distribution of patients based on type of complications

Complications	Number	Percentage (%)
Yes	0	0
No	20	100
Total	20	100

None of the patients had any complications post operatively.

Table 4: Distribution of patients based on final outcome

Final Outcome	Number	Percentage (%)
Excellent	9	45
Good	11	55
Total	20	100

DISCUSSION

The results of the present study, as reflected in Tables demonstrate a noteworthy pattern in the distribution of patients based on pain, complications, and final outcomes following tension band wiring for fractures of the Olecranon, Patella, or Medial Malleolus. The absence of postoperative pain (100% absence) and complications (100% absence) is a striking finding, suggesting a high level of success and patient satisfaction with the surgical intervention. Furthermore, the distribution of final outcomes reveals a favorable outcome in the majority of cases, with 55% classified as "Good" and 45% as "Excellent." These findings prompt a comprehensive discussion on the implications of these outcomes, the potential factors contributing to the observed success, and the significance of tension band wiring in the context of these fractures.

The absence of postoperative pain in all patients is a promising result, indicative of effective pain management strategies and the overall success of the tension band wiring procedure. The absence of pain is particularly crucial in orthopaedic surgeries, as it directly influences patient comfort, satisfaction, and postoperative rehabilitation. The meticulous attention to anaesthesia, patient positioning, and tourniquet application in the operative techniques might have contributed to the observed pain-free outcomes. This finding aligns with existing literature that highlights tension band wiring as a technique that provides stable fixation, thereby minimizing postoperative discomfort. However, it is essential to acknowledge potential limitations such as the subjective nature of pain reporting and the short-term nature of this study; longer-term follow-ups could offer insights into the durability of pain relief.

The complete absence of complications postoperatively is a significant and reassuring outcome. Complications following orthopaedic surgeries, such as infections, implant failure, or non-union, can significantly impact patient recovery and overall outcomes. The meticulous inclusion and exclusion criteria, along with the standardized operative techniques, may have contributed to this positive result. Additionally, the use of a convenient sampling technique might have inadvertently led to the inclusion of patients with more straightforward cases, reducing the likelihood of complications. While these findings are encouraging, it is important to note that longer-term studies and larger sample sizes are necessary to thoroughly assess the safety and potential complications associated with tension band wiring.

The distribution of final outcomes underscores the overall success of tension band wiring in the management of fractures of the Olecranon, Patella, or Medial Malleolus. The majority of cases (55%) were classified as "Good," indicating satisfactory outcomes in terms of functional recovery and fracture healing. Furthermore, 45% of cases were classified as "Excellent," suggesting a high level of success and minimal

functional impairment. These outcomes align with the established efficacy of tension band wiring in providing stable fixation and promoting early mobilization, crucial factors contributing to favorable outcomes. The distribution of final outcomes also emphasizes the versatility of tension band wiring across different anatomical sites, reinforcing its effectiveness in fractures involving the Olecranon, Patella, or Medial Malleolus.

The "Excellent" and "Good" outcomes could be attributed to several factors, including the careful patient selection, adherence to standardized operative techniques, and the absence of complications. The technique's ability to convert tensile forces into compressive forces, particularly in fractures that experience repetitive axial loading, might have played a pivotal role in achieving anatomical alignment and promoting optimal healing conditions. The distribution of outcomes also underscores the importance of tension band wiring as a viable option for fractures of diverse anatomical locations, offering a consistent and reliable approach to achieve favorable results.

However, it is crucial to acknowledge certain limitations in this study. The relatively small sample size and the short duration of follow-up might not capture the full spectrum of potential complications or long-term outcomes associated with tension band wiring. Additionally, the use of convenient sampling could introduce selection bias, limiting the generalizability of the findings to a broader population. Future research endeavors should consider larger sample sizes, longer follow-up periods, and more diverse patient populations to enhance the robustness and applicability of the results [8-11].

CONCLUSION

In conclusion, the results of this study present a promising picture of the outcomes associated with tension band wiring in fractures of the Olecranon, Patella, or Medial Malleolus. The absence of postoperative pain and complications, coupled with the predominantly "Good" and "Excellent" final outcomes, underscores the efficacy and reliability of this surgical technique. While the findings provide valuable insights into the immediate postoperative period, continued research with larger cohorts and longer follow-up durations is imperative to validate the durability of outcomes and assess the long-term safety profile of tension band wiring across various fracture types.

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