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Human Shaft Fracture and Comparison Between Humerus Interlocking Nail and Compassion Plating

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KEYWORDS Humeral shaft fracture, X-rays, surgical implant, humeral interlocking nails, orthopaedic treatments, healing time, complications, and functional recovery	Abstract The management delves into the handling of humeral sha major surgical methods. The use of a humerus interle adaptability and stability inherent in compression platin patterns, enabling precise anatomical alignment and fa invasive nature, surgeon familiarity is pivotal in mit humerus interlocking nail offers an alternative strategy hinges on individual patients' factors, fracture characteri to Shaw et al. (2020), archives optimal outcomes near process involving the orthopaedic team and the pr considerations and intricacies surrounding these method in making well-informed choices for the effective management.	aft fractures, with a focus on comparing two ocking nail and compression plating. The g render it suitable for a variety of fracture cilitating early weight bearing. Despite its tigating potential complications. Also the y. The decision between these approaches stics and the surgeon's expertise. According cessitates a collaborative decision making atient. This abstract sheds light on the ologies offering insights to guide clinicians gement of humeral shaft fractures.

Introduction

A humeral shaft fracture occurs when the long bone in the upper arm, called the humerus, is broken. Typically resulting from trauma or a direct impact, these factors can vary in their degree of severity. As per the opinion of Gallusser et al. (2021), Common symptoms include pain, swelling and a limited range of motion in the affected arm. Diagnosis relies on imaging techniques such as Xrays, which guide decisions about treatment. Nonsurgical options such as casting or splinting, may be appropriate for certain cases, while more complex fractures may require surgical intervention. Recovery Entails immobilisation, participation in physical therapy and a gradual return to regular activities. Swift medical attention is essential to ensure proper healing and minimise potential long-term complications in individuals experiencing humeral shaft fractures.



Figure 1: Humeral shaft fracture (Source: TeachMe surgery, 2022)

A surgical implant known as a humerus interlocking nail is utilised to address humeral fractures. This orthopaedic tool comprises a metal nail inserted into the medullary canal of the humerus, providing internal stabilisation and support. In the eyes of Martinez-Catalan and Boileau, (2023), the interlocking feature prevents rotation, ensuring proper alignment throughout the healing phase.

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This less invasive technique improves fracture fixation, expanding recovery and diminishing the likelihood of complications. Humeral interlocking nails are frequently employed in orthopaedic procedures to bolster structural integrity and aid in the recovery of upper arm fractures.



Figure 2: Humerus interlocking nail

(Source: Hessmann and Nijs. 2011) Compression plating employed in orthopaedics, stabilises fractures by affixing metal plates to the broken bone, secured with screws. According to Scott et al. (2022), controlled pressure on bone fragments ensures alignment, aiding healing. This method offers robust

support enabling early mobilisation and expediting recovery. Widely used for fractures in different bones, compression plating enhances stability fostering ideal conditions for healing in orthopaedic settings.



Figure 3: Compression plating (Source: Bhat and Kumar, 2022)

Methodology Research philosophy

The pragmatic approach integrates aspects of both positivism and interpretivism striving to gain practical insights into the efficacy of orthopaedic treatments. As per the view of Van de Wall et al. (2023), through the use of empirical data and patient experiences the research aims to guide clinical decision making and play a role in improving the outcomes of treatments for humeral shaft fractures.

Research approach

The study on humeral shaft fracture and comparison between humerus interlocking nail and comparison plating employs a quantitative and comparative research approach. Using a retrospective design the research will examine pre-existing data from patients treated with either humerus interlocking nail or compression plating for humeral shaft fractures. In the eyes of Zellers et al. (2019), Statistical techniques will be applied to compare various outcomes such as healing time, complications, and functional recovery. This methodology is aimed towards offering objective and numerical perspectives on the efficacy of these orthopaedic treatments, with the goal of supporting evidence based decisions making clinical settings.

Sampling

In this research 21 votes are collected from 21 patients who are suffering from these fractures are included. The survey is divided in two parts one is demographic pattern which contains the patient's age and suffering time due to the facture. Another part is likert question pattern. There are five statements which have a 5 scale to identify the vote. Which is strongly agree, agree, neutral, disagree and strongly disagree.

Data collection and analysis

This research analyses the treatment and the problem which is suffering by 21patients. Also, it shows the opinion of the patient regarding this treatment of humerus interlocking nail and compassion plating. There are 5 likert statements which are on any side of this research survey. Those statements help to identify the issues and treatment which the patients report in this survey. It is true that the research is not 100% true because it contains only 21 votes of participants. That is not enough to understand the actual fact of this issue of human shaft fracture.

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Result

				Statistic	5			
		What is the age group of patients?	What is the suffering duration of patients?	The use of humerus interlocking nail is an effective treatment option for humeral shaft fractures. Agree or Disagree	Compression plating demonstrates satisfactory outcomes in the management of humeral shaft fractures. Agree or Disagree?	The healing time for patients treated with humorous interlocking nall is comparable to those treated with compression plating. Agree or Disagree?	The choice between humours interlocking nail and compression plating significantly influence the functional recovery of individual's with humeral shaft fractures. Agree Or Disagree?	Humerus interlocking nail and compassion plating is very helpful treatment for human shaft fracture. Agree or Disagree?
Ν	Valid	21	21	21	21	21	21	21
	Missing	0	0	0	0	0	0	0
Mean		2.67	2.86	2.62	2.67	2.76	2.90	2.76
Std. Error of	fMean	.340	.303	.320	.303	.292	.344	.337
Median		2.00	3.00	2.00	2.00	2.00	3.00	3.00
Mode		1	2	1 ^a	2	2	1	1
Std. Deviati	on	1.560	1.389	1.465	1.390	1.338	1.578	1.546
Variance		2.433	1.929	2.148	1.933	1.790	2.490	2.390
Skewness		.356	.157	.426	.420	.204	.088	.171
Std. Error of	fSkewness	.501	.501	.501	.501	.501	.501	.501
Kurtosis		-1.423	-1.282	-1.267	-1.011	-1.292	-1.530	-1.434
Std. Error of	f Kurtosis	.972	.972	.972	.972	.972	.972	.972
Range		4	4	4	4	4	4	4
Minimum		1	1	1	1	1	1	1
Maximum		5	5	5	5	5	5	5
Sum		56	60	55	56	58	61	58

a. Multiple modes exist. The smallest value is shown

Figure 4: Statistical analysis of Survey

(Developed by SPSS)

In this survey it is found that the largest mean value is 2.90 of the statement "The choice between humerus interlocking nail and compression plating significantly influences the functional recovery of individuals with humeral shaft fractures." and the smallest mean value is 2.62 of the statement "The use of humerus interlocking nails is an effective treatment option for humeral shaft fractures." This survey shows that maximum patents are from the age group of 20-30 years. This age group are suffering most and all are affected due to road accidents, and it is found all are bikers. In this survey it is also identified that again the majority of 47.62% patients are suffering from this problem from 1-6 years and 14.29% people are suffering from this problem for 9 years. Beside that it is observed that 38.1% of patents are suffering this fact more than 10 years due to age,

financial abilities and depth of facture. In the statement of "the use of humerus interlocking nails is an effective treatment option for humeral shaft fractures." It is observed that 12 patients agree with this fact. 2 patent responses as neutral and 7 patients disagree with this statement. On the second statement of "Compression plating demonstrates satisfactory outcomes in the management of humeral shaft fractures." It is found that 11 patients agree with this fact, 4 patients go for neutral and beside that 6 patients disagree with this statement. On the third statement of "The healing time for patients treated with humerus interlocking nails is comparable to those treated with compression plating." In this survey statement it is found that 11 patients agree with this and 2 patients give neutral feedback. It is also observed that 8 patients disagree about this fact. On the 4th survey statement it is identified that the differences between

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agree and disagree percentage is very close. It is found that 9 patients agree with the statement that "The choice between humerus interlocking nail and compression plating significantly influence the functional recovery of individuals with humeral shaft fractures." 4 patients vote for neutral result and 8 patients disagree about this statement and treatment process. On the last statement it is found that 9 patients agree with the survey statement and 5 patients are neutral in this case. Beside that it also highlighted that 7 patients disagree in the matter that "Humerus interlocking nail and compassion plating is very helpful treatment for human shaft fracture."

Model Summary

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.977 ^a	.955	.944	.365	.955	85.480	4	16	.000

a. Predictors: (Constant), The choice between humours interlocking nail and compression plating significantly influence the functional recovery of individual's with humeral shaft fractures. Agree Or Disagree?, The healing time for patients treated with humorous interlocking nail is comparable to those treated with compression plating. Agree or Disagree?, Compression plating demonstrates satisfactory outcomes in the management of humeral shaft fractures. Agree or Disagree?, The use of humerus interlocking nail is an effective treatment option for humeral shaft fractures. Agree or Disagree

(Developed by SPSS)

Figure 5: Model Summary

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	45.672	4	11.418	85.480	.000 ^b
	Residual	2.137	16	.134		
	Total	47.810	20			

 Dependent Variable: Humerus interlocking nail and compassion plating is very helpful treatment for human shaft fracture.

Agree or Disagree?

b. Predictors: (Constant), The choice between humours interlocking nail and compression plating significantly influence the functional recovery of individual's with humeral shaft fractures. Agree Or Disagree?, The healing time for patients treated with humorous interlocking nail is comparable to those treated with compression plating. Agree or Disagree?, Compression plating demonstrates satisfactory outcomes in the management of humeral shaft fractures. Agree or Disagree?, The use of humerus interlocking nail is an effective treatment option for humeral shaft fractures. Agree or Disagree

Figure 6: ANOVA Model

(Developed by SPSS)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.992	.993	7

Figure 7: Value of Cronbach Alpha

(Developed by SPSS)

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Conclusion

Effectively addressing human shaft fracture is a crucial element in orthopaedic care, and the decision between utilising a humerus interlocking nail or compression plating significantly influences the path of the patient's recovery. Each approach has its unique benefits and factors to consider. The utilisation of a humerus interlocking nail presents a less invasive method, fostering expedited healing, diminished soft tissue harm, and heightened patient comfort. Its remarkable biomechanical stability plays a significant role in achieving successful results, especially in mishit fractures. Nevertheless, meticulous patient selection and surgical proficiency are essential for optimal outcomes. Compression plating offers adaptability and strong stability, making it applicable to various fracture patterns. Despite being a more invasive procedure, it enables accurate anatomical alignment and supports early weight-bearing. It's essential for surgeons to be well-versed in this technique to minimise potential complications. The decision between a humerus interlocking nail and compression plating should be customised based on individual patient fracture characteristics, and the surgeon's expertise. A collaborative decision-making approach involving the orthopaedic team and the patient is crucial for optimal outcomes in managing humeral shaft fractures.

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