Original Article

To Assess the Causes of Implant Failure in Treatment of Closed Femoral Diaphyseal Fractures

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ABSTRACT

Objective: To evaluate the responsible factors of implant failure in treatment of closed femoral diaphyseal fractures.
Study Design: Descriptive / cross sectional study
Place and Duration of Study: This study was conducted at the Department of Orthopaedic Surgery, LUMHS, Jamshoro and Hyderabad from August 2013 to July 2015.
Materials and Methods: 30 Patients with presentation of implant failure in treatment of closed femoral diaphyseal fractures were selected. Causes of implant failure were noted. All the data was recorded in the proforma.
Results: Total 30 cases with implant failure were included. Mean age was 45.5 ±10.3 years. Male were in majority 26(86.6%) and female were 4(13.4%). 76.7% cases had right sided and 23.3% cases had left side fracture. Responsible factors of implant failure were observed in all patients. from factors poor implant quality was the most common in 50% of the cases following by poor fixation technique in 16.6%, wrong size of the implant was in6.6% patients, noncompliance of instruction were noted in 23.3% cases and only in 3.3% cases implant failure due to inadequate weight bearing.
Conclusion: We concluded that poor implant quality was commonest responsible factor for the implant failure in treatment of closed femoral diaphyseal fractures

Key Words: Closed femur diaphyseal fracture, implant failure, responsible factors

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INTRODUCTION

Femoral shaft fracture is the commonest fracture experienced in orthopedic practice.[1]Despite expanded comprehension of biomechanics and design of implant, femoral shaft fracture's nonunion of keeps on delayof treatment of these wounds. This inconvenience introduces a troublesome treatment challenge for the specialists. There are a few techniques for treatment for non-union femoral diaphyseal which were at first treated with an IMN. This incorporates nail dynamization, change nailing, fixation of plate, grafting of bone, and addition of these.[2] Hygienic nonunion and low complicated cases well respond to the Ilizarov management.[3]Metals are the material of decision for manufacture of implant in light of the fact that they offer big stiffness, quality and great biocompatibility. To accomplish this point alongside development in the procedures of use of implant, the exceptional accentuation was on the change of metallurgy of implant to stay away from issues confronted with utilization of normal steel made implants.[4]Material of implant utilized for internal fixation must affirm to certain essential necessities like solid capacity and insignificant side effects. implants of orthopedic are mechanical artificial devices, while mounted skeletal arrangement of the body of human are presented not exclusively to stress of the muscular strengths of limbs yet presented to the living cells, tissues and organic liquids which are alterable as well as an unfriendly domain for the implant survivals.[5]Femoral shaft fractures among the most widely recognized fractures experienced in the orthopedic practice. Since the femur is long bone of the bodies and one of the main load-bearing bones of lower extremities, fractures may cause about delayed morbidities and broad handicap unless treatment is suitable. Fracture of the femur shaft frequently are the consequence of big-energy injury and might be related with numerous injuries type.[6]Many procedures are presently accessible for the treatment of it, and orthopedic specialist must know about disadvantages, limitations and advantages of each to choose the best possible treatment for every patient. Fracture's type and the area, the level of the comminution, patient's age, social and economical conditions of the cases and different elements may impact the technique for treatment.[7,8]One examination regarding implant failure at AAS lab of central capability division of the Pakistan Institute of Nuclear

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Science and Technology (PINST) obviously demonstrated that locally made implant aresubstandard without best quality and can't fit in with the require able implants properties.[9]Aside from nature of implant, the imperative part of implant utilize is choice of the implant and method of utilization in various fractures as per suggested principles.[10-13] The goal of this studywas to assess the reasons for failure of the implants in management of femoral diaphyseal fractures.

MATERIALS AND METHODS

This comparative study had carried out department of general surgery at Liaquat medical university hospital Hyderabad/Jamshoro with 6 months duration from November 2015 to April 2016.All the cases more than 18 years of age, both genders and diagnosis of with Grade 3 or 4 hemorrhoids were selected. All the cases with Grade 1 or 2 hemorrhoids, coexisting perianal disease, previous anal surgery and with severe co-morbidities like uncontrolled diabetes mellitus, chronic HCV and HBV were excluded. Subjects were selected through outpatient department OPD. Brief history of duration of illness and examination including proctoscopy were carried out and written consent was taken. All the necessary laboratory investigations including radiology were carried out. Patients were randomly divided into two groups, patients in group one were treated with conventional hemorrhoidectomy, and patients in group two were treated with the stapled hemorrhoidectomy. Surgeries were performed by consultant general surgeons. All the data regarding age, sex, duration of disease, disease grads and postoperative complications was documented. Prophylactic antibiotic and painkillers were given equally preoperatively. All the data will be entered in the Performa. Data was analyzed in SPSS version 16.0

RESULTS

Total 30 cases with implant failure in the treatment of close Femoral diaphyseal fractures were incorporated. Mean age ± SD were 45.5±10.3 years. Table: 1.
Male were in majority 26(86.6%) and 4 (13.4%) were female. Table: 1
In this study history of Road Traffic Accidents was most common in 25(83.34%) patients. Fig:1
23(76.7%) cases having implant failure at right side and 07(23.3%) cases having left sided implant failure Fig:2
In this study responsible factors for implant failure were noted in all cases. These factors were found as poor fixation techniques were noted in 5(16.6%), wrong implant size were noted in 02(6.6%), poor quality of the implant "locally made" was noted in 15(50.0%), non-compliance instructions were in 07(23.3%) cases and only 1(3.3%) cases was found with inadequate weight bearing protocols. Table 2

Table No.1. Age and gender distribution of patients n=30

	Frequency (%)
Age (Mean±SD)	45.5±10.3 years
Gender	
Male	26(86.6%)
Female	04(13.4%)

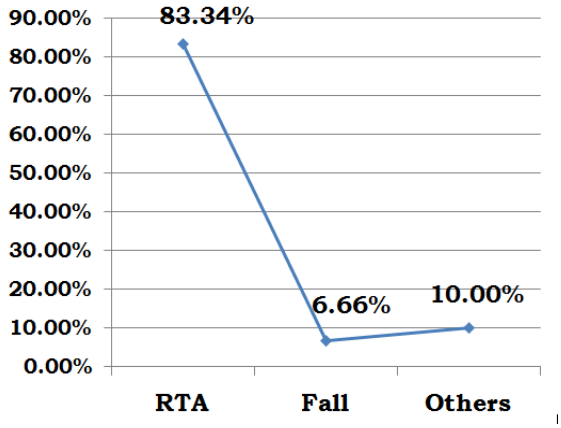

Figure No.1: Causes of fractures n=30

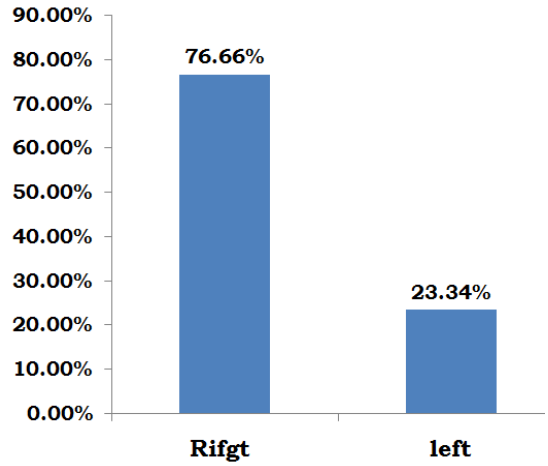

Figure No. 2: Site of fractures n=30

Table No.2. Age and gender distribution of patients n=30

Responsible factors of implant failure	Frequency (%)
Poor fixation	05(16.6%)
Implant improper size	02(06.6%)
Poor quality of implant	15(50.0%)
Non-compliance of the instructions	07(23.3%)
Weight bearing inadequate protocols	01(03.3%)

DISCUSSION

Failure of the implant mostly arises due to loosing of internal fixation or its breakage, because metal plates are not flexible as bones, metallic plate screwing stiffen

the bones it and create (stress riser) on the each end point of plate.[14] Long bone fracture mostly occurs in young age. In this study mean age of the cases was 45.5±10.3 years. While Wiss et.al[10] reported mean age was 29 years. Series of mean age 28 years in cases with femoral shaft fractures stated. This difference of the mean age in our study and other may because in our study some old age peoples were comes with history of fall. In our findings male were in majority 26(86.6%) as compare to women 4(13.4%). Similarly Ogbemudia AO et al[15] reported that male were in the majority. Majority of the male patients were because male were more involve in the outdoor activities. In this study history of Road Traffic Accidents was most common in 25(85.0%) patients. In studies of Johnson and Greenberg[17] reported that right side was mostly affected. Similarly Wisset al[10] of reported that fractures were mostly found at right side. As well as in our study right sided was found most common.

In this study responsible factors for implant failure were noted in all cases. These factors were found as poor fixation techniques were noted in 5(16.6%), wrong implant size were noted in 02(6.6%), poor quality of the implant "locally made" was noted in 15(50.0%), non-compliance instructions were in 07(23.3%) cases and only 1(3.3%) cases was found with inadequate weight bearing protocols. Peivandi MT et al[16]stated that the commonest cause involve in implant failure as itrogenic causes in 4% cases, non-compliance with post-operative instructions in the 34.8% of the cases andpoor implants quality was in 60.9% cases.[16] Sharma et al[17] demonstrated that commonest cause of implant failure was the traumatic occurrence before complete fractures' healing. Vallier et al[18]demonstrated that 6 patients with implants failure out of 46 cases treated by LCP-condylar plate by the attention to bone loss or the average comminution as the conceivable inclination to failure of implant. Ogbemudia AO et al[15] reported that the probability of over the top body weight and early weight bearing as hazard components for implant failure. A planned randomized review is important to evaluate the genuine extent of the impact of each of these variables on the rate of implant failure and to enable the worthy measurable deduction to be acquired.[15] In some other studies stated that implant failure may cause the populace to delay the treatment of fractures in the setting where support of traditional bonesetters is still very up.[19,20]

CONCLUSION

We concluded that poor implant quality was commonest responsible factor for the implant failure in treatment of closed femoral diaphyseal fractures. More randomized studies are required to conform our findings.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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