

FACTORS AFFECTING IMPLANT FAILURE IN FRACTURE OF THE SHAFT OF FEMUR

Lakhey S*, Maheshwari J*, Malhotra R*

ABSTRACT

17 cases of implant failure of fracture of shaft of femur were studied. All cases were young adults less than 40 years of age. 15 were males. 16 of 17 cases sustained their initial injury in road - traffic accidents. Plate failures were detected earlier than those of nails as nails kept on providing splintage to an otherwise ununited fracture. 10 of 17 cases were treated by interlocking nailing during the resurgery. Cortico-cancellous bone grafting was done in 9 of 17 cases as per merit of each case. Follow-up ranged from 6 months to 2 years. 15 of 17 cases went on to sound union after the second operation.

The wrong choice of implant, implants improperly applied and bone grafting not done as recommended (i.e. technical errors) is the major cause of implant failure. Nails with diameter more than 10 mm should be used as far as possible. Early detection and resurgery for K-nail failure should be done to prevent greater amount of shortening. Wherever plating is done, instead of attempting anatomic reduction and devascularising the bone, biological method of fixation should be used.

Key Words: Implant Failure, Shaft of Femur, Fracture.

INTRODUCTION

The incidence of femoral shaft fractures in adults is of the magnitude of 15 to 20 fractures per 1,00,000 person per year.¹ Nowadays, femoral shaft fractures in adults are usually treated operatively. With more and more of femoral shaft fractures getting operated, the number of complications has proportionately increased. One such complication is implant failure. An objective assessment of the exact circumstances that lead to implant failure is necessary to prevent this complication in one of the major weight bearing bones of the body. Since there are a variety of implants used for the same type of fractures, the type of failure would also be variable. For example, The incidence of bent intramedullary nail has

ranged from 7.84%² to 16%.³ The incidence of broken nails has been much lower, ranging from 0.01%⁴ to 2.3%.⁵ The incidence of plate failures reported in literature has been more consistent : 15% by Jenson et al (1976),⁶ 6.9% by Ruedi,⁷ 7% from Basal, 11% from ST Gallen and 13% from Vancouver,⁸ and 11.8% by Bostman et al (1989).⁹

Handling an implant failure situation, with all its associated problems, can be a horrifying experience for the patient and the surgeon alike. In this background, it was decided to study the cases of implant failure of the shaft of the femur, its pattern and causes for failure so as to suggest guidelines to minimize further failures.

* B.P. Koirala Institute of Health Sciences, Dharan, Nepal.

Address for correspondence : Dr. Shishir Lakhey
Dept. of Orthopaedics
B.P. Koirala Institute of Health Sciences, Dharan, Nepal.
Email: slakhey64@yahoo.com

MATERIAL AND METHODS

Seventeen cases of implant failure in fractures of the shaft of the femur who presented in the Department of Orthopaedics at AIIMS (New Delhi, India), were studied under the following headings.

1. Age
2. Sex
3. Nature of primary injury
4. Anatomical site of the fracture
5. Type of primary fixation
6. Correctness of implant selection
7. Adequacy of fixation
8. Weight bearing
9. Re-trauma
10. Treatment of implant failure
11. Outcome

The shaft of the femur was defined as the portion of the femur from 5 cm below the lesser trochanter to 6 cm above the articular surface of the medial condyle.⁵ The femur was divided into an equal upper third, middle third and lower third for descriptive purposes.

Inclusion criteria

All traumatic fractures of the shaft of femur that were treated primarily by open reduction and internal fixation, with implant failures comprising of bent or broken plates or nails.

Exclusion criteria

Infected implant failures and implant failures in pathological fractures of femur.

All seventeen cases were treated by re-surgery comprising of implant removal, fracture reduction, stable internal fixation with an intra or extramedullary implant and bone grafting by four senior consultant orthopaedic surgeons with more than 15 years each of experience in the speciality. Cortico-cancellous bone grafting was done in 9 of 17 cases. In 2 out of 9 cases, fibular grafting was done in addition. Cortico-cancellous bone grafting was done when the fracture site radiologically and/or on operative exposure showed poor signs of biological activity. Fibular grafting was applied intramedullary in osteoporotic bones when plate fixation was used.

The implant for resurgery was the personal choice of the operating surgeon. Union was confirmed by standard clinico-radiological assessment methods. The results were analysed between 6 months to 2 years by a questionnaire proforma with closed-ended or pre-categorized answers. The average follow-up was 20 months.

RESULTS

All implant failure cases were young adults (14-40 years). 15 were males and 2 were females. 16 cases (94%) had sustained their initial injury in road-traffic. Fall from stairs accounted for 1 case.