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Study of management of sub trochanteric fractures of the femur in adults using proximal femoral nails

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Abstract

Introduction: Among the femoral shaft injuries upper femoral fractures present a peculiar problem of securing effective neutralization of deforming forces. The mechanical stresses at this level are very high.

Conclusion: The incidence of Subtrochanteric fractures of the femur is on the raise because of fast and high speed automobiles and modern lifestyles and increased life expectancy of the elderly age group patients.

Keywords: Sub trochanteric fracture, proximal femoral nail, femur fracture

Introduction

Fractures of the proximal femur is a very important topic in the field of orthopedic surgery, but much of that attention is placed on fractures of the femoral neck and intertrochanteric areas. An additional area that must be well understood is the subtrochanteric (ST) region of the femur, which is defined as the proximal femoral shaft located within 5 cm of the lesser trochanter (Figure 1). This area experiences high levels of stress and fractures to this area can result in significant complications and poor clinical outcomes if not managed properly. A better understanding of fracture biomechanics and the development of better implants and surgical techniques have led to improved treatment of sub trochanteric fractures which have historically been difficult to treat. Historically these fractures were treated with broadly two modalities of internal fixation i.e. sliding compression hip screw with side plate assembly and intra medullary fixation devices. Proximal Femoral Nail was introduced in 1997 by AO-ASIF have shown better results in the management of these fractures because of its improved well proven design, optimal stability, additional anchoring, dynamic locking, option for secondary dynamic locking, ease of insertion and prevention of later fracture. This prospective study is conducted to assess the utility and effectiveness of Proximal Femoral Nail evolved by AO-ASIF in 1997, as the treatment modality of choice for Sub trochanteric femoral fractures.

AIMS & Objectives

To evaluate the results of internal fixation of Sub trochanteric fractures of the femur with Proximal Femoral Nail

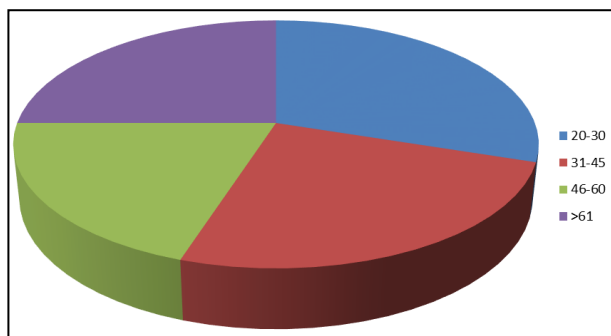
Material and methods & observation

The present study consists of the patients admitted to orthopedic unit of Hospital between May 2016 and October 2018. 20 fracture cases were treated in Department of Orthopaedics

Table 1: Age of the patient with sub trochanteric Fractures

Age group	Number of patients	Percentage
20-30	6	30%
31-45	5	25%
46-60	4	20%
>61	5	25%
Total	20	100%

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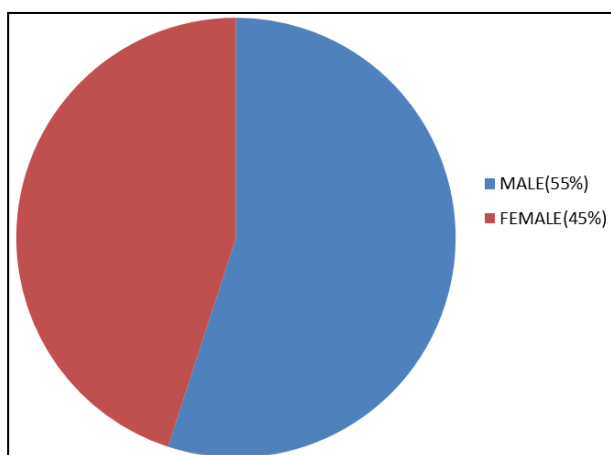
Graph 1: Age of the patient with sub trochanteric fractures

The youngest patient in our series is 22 years old and the oldest is 82 years. Maximum number of patients in this study are of 20-30 age group and the mean age is 51.6 years, as mentioned in Table 1 & Graph 1.

Table 2: Sex and type of injury

Sex	Number of patients	Percentage
Male	11	55%
Female	9	45%
Total	20	100%

In the present study 11 patients were males & 9 were females. As depicted in the table 2 & Graph 2



Graph 2: Sex of Patient

Discussion

Fractures of the long bones are a major social and economic problem. Of the long bone fractures Subtrochanteric fractures of the femur have peculiar anatomic and mechanical characteristics which poses problems in their management. Closed intramedullary devices have a mechanical advantage that effectively addresses these factors. The benefit of minimal surgical exposure, more efficient load transfer through calcar femorale and decreased tensile strain on the implant because of its shorter lever arm makes proximal femoral nail a good choice of implant for subtrochanteric fractures of the femur. Various studies have considered Proximal Femoral Nail as an acceptable minimally invasive implant for Subtrochanteric fracture.

Conclusion

- The subtrochanteric fractures of femur are common in the elderly population mainly due to osteoporotic bones and in young population due to high velocity trauma.
- The mode of injury leading to subtrochanteric fractures of femur in elderly is simple domestic fall where as young individuals get traumatized because of road traffic accidents and fall from height.
- The incidence of medical comorbidities is high in elderly population that needs to be optimized before considering

operative management.

- The conservative treatment of sub trochanteric fractures of femur is obsolete now as it frequently led to nonunion, mal union with shortening, limitation of hip range of motion as well as complications of prolonged immobilization such as decubitus ulcers, deep vein thrombosis and respiratory tract infections.
- Early reduction and internal fixation increases patient comfort and helps in the early mobilisation of the patient and thus improves the quality of life of the patient.
- Anatomical reduction can be achieved, in majority of patients by closed manipulative methods.
- Proximal femoral nail being an intramedullary device is biomechanically superior as compared to extramedullary devices and has the load sharing characteristics.
- As performed by closed technique it reduces the chances of infection and non-union because there is minimal soft tissue stripping and fracture hematoma is preserved.
- The device is fixed in both dynamic and static mode so in case of delayed union it can be dynamited.
- Out of two screws put in the neck, the proximal one functions as a derotation screw and the distal one acts as collapsing screw. These screws should be placed in the center of the head and neck.

Result

In our series of 20 cases of Subtrochanteric fractures treated with Proximal Femoral Nail, 17 patients had Excellent to good outcome at their final follow up. Poor outcome was seen in 3 patients. 2 of these 3 patients had poor reduction intraoperatively. All these patients also belonged to geriatric age group who had associated degenerative joint disease of the knee affecting the final functional outcome.

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