

A STUDY OF CLINICAL AND SURGICAL OUTCOME OF FRACTURE NECK OF FEMUR

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ABSTRACT

BACKGROUND

Fracture neck of femur has high incidence of complications even with treatment, hence it is also termed as unsolved fracture. Factors making treatment difficult are the blood supply to head, which gets cut off and difficulty in achieving reduction.

Impacted fractures can be treated conservatively. If the fracture is undisplaced, a conservative approach may be done or multiple cancellous screws can be used.

If the patient's age is less than 60 years, a closed reduction under C-arm control can be tried. If the reduction is possible, then multiple screw fixations can be done. If reduction is not achieved, then open screw reduction and screw fixation can be done.

If the patient is above 60 years of age, then it is preferable to excise the head off and replace it with prosthesis. If the hip is normal, then hemiarthroplasty with a unipolar or bipolar prosthesis can be done. If the hip has pre-existing arthritis, then total hip replacement surgery is advisable.

A sincere effort has been put to understand the clinical and surgical outcome of fracture neck of femur in elderly. This paper is intended to help the practicing orthopaedicians to understand the various treatment modalities which is commonly used in practice and also the complications which are associated with the pathology.

METHODS

- The study was done in the Department of Orthopaedics, Travancore Medical College at Kollam.
- The study was done from August 2014 to June 2016.
- Eighty cases who attended in the Department of Orthopaedics were taken for the study.
- Detailed History and Clinical Examination was conducted.

INCLUSION CRITERIA

- Both traumatic and pathological fractures were taken up for the study.
- Individuals who were aged more than 55 years were taken up for the study.

EXCLUSION CRITERIA

- Aged less than 55 years were not considered.
- All the statistical analysis was done using the latest SPSS software 2015 (California).

RESULT

Fracture neck of femur was seen more in female sex that accounted to sixty nine percent (55) compared to their male counterparts, which was found to be thirty one percent. The age distribution of the fracture neck of femur showed that forty two cases belonged to age group sixty five to seventy five years followed by age group seventy five to eighty five years, which amounted to twenty three cases. Age group sixty five to seventy five years amounted to twelve cases and the least number of cases were seen in age group more than eighty five years, which amounted to three in number. Based on aetiology of fracture neck of femur, traumatic fractures amounted to eighty nine percent (71) of all the cases and pathological fractures amounted to eleven percent (9). Based on the treatment modalities fifty three cases were treated by hemiarthroplasty followed by cannulated cancellous screw fixation in sixteen cases, total hip replacement in seven cases and conservative management in four cases.

Few post-surgical complications were encountered following surgery, which were namely osteoarthritis in four cases, non-union in three cases, mal-union in two cases and avascular necrosis in one case. The complications showed significant association in cases of post-surgical neck of femur fracture.

CONCLUSION

This study shows that the major risk factor for fracture neck of femur is traumatic. The study also shows complications that was significantly associated in cases of post-surgical neck of femur fracture.

KEYWORDS

Clinical, Surgical, Fracture, Neck of Femur, Trauma.

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INTRODUCTION: When skeleton fails to cope up with the load it is put on, fracture results. Break in continuity of bone is known as fracture.

On basis of Aetiology, Fractures can be Classified into Two Types;

- **Traumatic Fracture:** These are fractures sustained due to trauma, e.g., fractures due to road traffic accidents, falls, fights, etc.
- **Pathological Fracture:** In some cases bone would be weakened due to some pathological process. Such a bone will fracture even with a trivial force. This is called pathological fracture, e.g., osteomyelitis, osteosarcoma, bone cysts, osteoporosis, etc.

On basis of Displacement, Fractures can be Classified As;

- **Undisplaced Fracture:** There is absence of significant displacement.
- **Displaced Fracture:** In these fractures there can be shift, angulation or rotation of fractured fragments; the cause for this can be the impact, muscle pull on the fragments or gravity.

On basis of the Relationship of Fractured Fragments with External Environment, Fractures can be Classified As;

- **Closed Fracture:** In these fractures, the skin and other soft tissues overlying the fracture fragments are intact. The fracture fragments are not in contact with the external environment.
- **Open Fracture:** Here there is break in the skin and soft tissues overlying the fracture fragments. The fragments are in contact with the external environment. It can be internally open, where the sharp fracture fragment pierces the skin and soft tissues from within or it can be externally open where the impacting force/object causes laceration and through this the fractured fragment comes in contact with external environment.

On basis of Complexity of Treatment, there are Two Kinds of Fracture;

- Simple fracture, where the fracture is in two pieces and is easy to treat.
- Complex fracture, where the fracture is in multiple pieces and is difficult to treat.

On basis of Pattern, Fractures can be Classified As;

- **Transverse Fracture:** Here fracture line is perpendicular to long axis of bone.
- **Oblique Fracture:** Here the fracture line is oblique.
- **Spiral Fracture:** Here fracture line runs spirally.
- **Comminuted Fracture:** Here there are multiple fracture fragments.

Femur is the longest bone in the body. Parts of femur are head, neck, body and trochanters.

Fracture neck of femur is an intracapsular fracture, and many number of these are displaced with the distal fragment pulled up and externally rotated. It is usually seen in elderly people where the fracture occurs with a trivial fall. Osteoporosis is considered a contributory cause. In young adults, fracture neck of femur occurs as a result of severe impact. Fracture neck of femur is uncommon in children.

Fracture Neck of Femur can be Classified on Different Basis¹:

- **Anatomical Classification:** Based on anatomical location fracture neck of femur can be classified as,
 - Subcapital, where the fracture is just below the head.
 - Transcervical, where the fracture is at the middle of the neck.
 - Basal, where the fracture is at the base of the neck.
- **Pauwels' Classification:** It is based on angle of inclination of fracture in relation to horizontal plane. It is further divided into type I, type II and type III.
- **Garden's Classification:** It is based on degree of fracture displacement. The degree of displacement is judged by the change of direction of the medial trabecular stream of the neck in relation to bony trabeculae in head and in corresponding part of acetabulum.
 - **Stage 1:** It is also known as abducted or impacted fracture. It is an incomplete fracture, the head is tilted posterolaterally causing an obtuse angle laterally at trabecular stream.
 - **Stage 2:** Here the fracture is complete, but undisplaced. There is break in the trabecular stream with some angulation.
 - **Stage 3:** Here the fracture is complete and partially displaced. The alignment between the trabeculae of head and acetabulum is lost. The trabecular line at the site of fracture is broken and displaced.
 - **Stage 4:** This fracture is complete and fully displaced. Here there is total loss of contact between trabeculae of head and neck, but the trabecular stream between head and acetabulum are normally aligned. The cause for this is as the distal fragment rotates outwards, there is loss of contact with the head and the head springs back to original position.

Rarely, a patient with impacted fracture may complain of pain in the groin and come walking to the OPD. Usually, the patient is elderly and the presenting complaints are inability to walk and pain in the groin.

On clinical examination usual findings are external rotation and shortening of the limb, tenderness in the groin, painful hip movements and active straight leg raising is not possible.

Incidence of femoral neck fractures are on the rise.^{2,3} In a developing country like ours, the load of these patients who needs tremendous care is on the rise.

X-Ray of Pelvis with Both Hips may Show¹:

- Break in medial cortex of neck.
- External rotation of femur.
- Overriding of greater trochanter.
- Break in trabecular stream.
- Break in Shenton’s line.
- Bending of trabeculae in case of impacted fracture.

Fracture neck of femur has high incidence of complications even with treatment, hence it is also termed as unsolved fracture. Factors making treatment difficult are the blood supply to head, which gets cut off and difficulty in achieving reduction.

Impacted fractures can be treated conservatively. If the fracture is undisplaced, a conservative approach may be done or multiple cancellous screws can be used.

If the patient’s age is less than 60 years, a closed reduction under C-arm control can be tried. If the reduction is possible, then multiple screw fixations can be done. If reduction is not achieved, then open screw reduction and screw fixation can be done.

If the patient is above 60 years of age, then it is preferable to excise the head off and replace it with prosthesis. If the hip is normal, then hemiarthroplasty with a unipolar or bipolar prosthesis can be done. If the hip has pre-existing arthritis, then total hip replacement surgery is advisable. Hemiarthroplasty is the choice of treatment and has been utilised as the mode of treatment in majority of cases.⁴⁻⁸

Various Complications can be Encountered;

- Non-union can be seen in 30%-40% of femur neck fractures. It occurs due to poor blood supply and inadequate immobilisation of fracture. The chief complaint of the patient will be inability to bear weight on the affected limb. If the patient is above 60 years of age, then hip replacement is advisable. If the patient is younger, then attempt is made to preserve the head by neck reconstruction or Pauwels’ osteotomy.
- Avascular necrosis can be seen, because of cut off of medullary blood supply and capsular blood supply to the head of femur. In young patients treatment options are arthrodesing the hip, bipolar arthroplasty, Meyer’s procedure or rarely total hip replacement. In

elderly, hemi-replacement arthroplasty or total hip replacement is done.

- Osteoarthritis may develop few years post fracture neck of femur. It is because of avascular deformation of head or faulty alignment union. The patient presents with pain and stiffness of joint. Young patients are treated with intertrochanteric osteotomy or arthrodesing the hip. Total hip replacement is the best option for elderly.¹

A sincere effort has been put to understand the clinical and surgical outcome of fracture neck of femur in elderly. This paper is intended to help the practicing orthopaedicians to understand the various treatment modalities, which is commonly used in practice and also the complications which are associated with the pathology.

AIMS AND OBJECTIVES: To study the clinical and surgical outcome of femur neck fracture.

MATERIALS AND METHODS: The study was done in the Department of Orthopaedics, Travancore Medical College at Kollam.

The study was done from August 2014 to June 2016.

Eighty cases who attended in the Department of Orthopaedics were taken for the study.

Detailed History and Clinical Examination was conducted.

Inclusion Criteria:

1. Both traumatic and pathological fractures were taken up for the study.
2. Individuals who were aged more than 55 years were taken up for the study.

Exclusion Criteria:

1. Aged less than 55 years were not considered.

All the statistical analysis was done using the latest SPSS software 2015 (California).

RESULTS:

	Mean	Std. Deviation
Age	63.11	11.112

Table 1: Mean Age of the Study Participants (n=80)

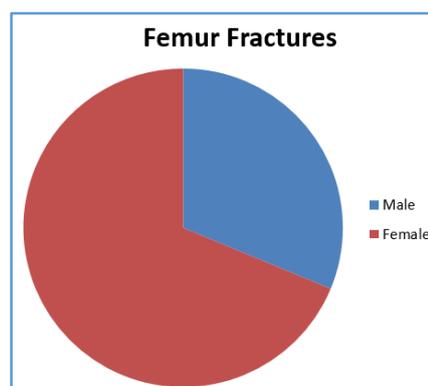


Image 1: Distribution of Sex

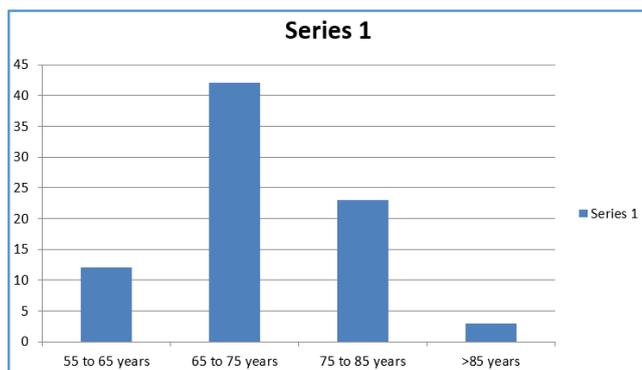


Image 2: Age Distribution of Fracture Neck of Femur

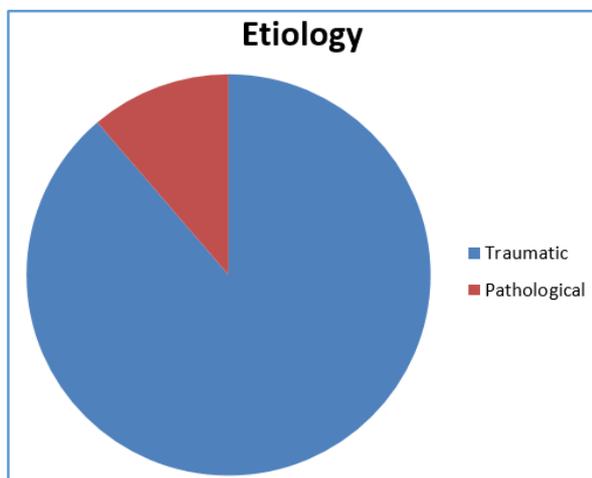


Image 3: Aetiology of Fracture Neck of Femur

Management	Frequency
Conservative	04
Cannulated Cancellous Screw Fixation	16
Hemiarthroplasty	53
Total Hip Replacement	07

Table 2: Treatment Modality

Complications	Incidence	X ² Value	P value
Non-union	3	8.920	0.030
Avascular necrosis	1		
Osteoarthritis	4		
Malunion	2		

Table 3: Showing Post-Surgical Complications

DISCUSSION: In our study the mean age of the study participants was 63.11 years with a standard deviation of 11.112. Fracture neck of femur was seen more in female sex that accounted to sixty nine percent (55) compared to their male counterparts, which was found to be thirty one percent. The age distribution of the fracture neck of femur showed that forty two cases belonged to age group sixty five to seventy five years followed by age group seventy five to eighty five years, which amounted to twenty three cases. Age group sixty five to seventy five years amounted to twelve cases and the least number of cases were seen in age group more than eighty five years which amounted to

three in number. Based on aetiology of fracture neck of femur, traumatic fractures amounted to eighty nine percent (71) of all the cases and pathological fractures amounted to eleven percent (9). Based on the treatment modalities fifty three cases were treated by hemiarthroplasty followed by cannulated cancellous screw fixation in sixteen cases, total hip replacement in seven cases and conservative management in four cases.

Few post-surgical complications were encountered following surgery which were namely osteoarthritis in four cases, non-union in three cases, mal-union in two cases and avascular necrosis in one case. The complications showed significant association in cases of post-surgical neck of femur fracture.

The study is in agreement with the other studies conducted by Christian Ossendorf et al.⁹

CONCLUSION: This study shows that the major risk factor for fracture neck of femur is traumatic. The study also shows complications that were significantly associated in cases of post-surgical neck of femur fracture.

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