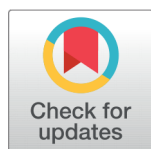


## ORIGINAL ARTICLE



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## Functional and radiological outcome of Ipsilateral neck with shaft of femur fracture

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### Abstract

**Background:** The incidence of ipsilateral neck of femur with shaft of femur fracture was around 1-9%. The diagnosis of femoral neck fractures are frequently missed during initial assessment due to more focus of femoral shaft fractures. There are hardly any literature regarding outcomes of ipsilateral neck and femur shaft fractures. The purpose of this study is to evaluate the clinical outcome and complications following management of Ipsilateral neck and shaft of femur fracture by various fixation methods. **Materials and Method:** This is a prospective study done at Sri Ramachandra Medical College between April 2015 to Dec. 2018 in Department of Orthopaedics. The Inclusion Criteria were patients above eighteen years having ipsilateral neck with shaft of femur fracture. The exclusion criteria were Isolated shaft or neck of femur fracture and patients who lost follow-up and open fractures. We had fifteen patient who had full follow up. The minimum follow up was taken as one year. Patients age group were between 24 years to 58 years with an average of 40 years. All the patients were followed by Modification of wilde et al Neer scoring system for outcome. **Results:** We had excellent results in five patients, seven patients had good and 3 patients had fair results. There was no poor result in any of our cases. In our study 67% of the cases had no complications. The Average time of union of the fracture was 25 weeks. All the fractures were united in our study. **Conclusion:** We were able to obtain satisfactory results with minimum complication rate. We were able to achieve excellent results in terms of neck union and shaft union. In Ipsilateral neck and shaft fractures, most neck of femur fractures are undisplaced or minimally displaced.

**Keywords:** Neck of femur; Shaft femur; Ipsilateral; Nonunion; Fracture

### 1 Introduction

The incidence of ipsilateral neck of femur with shaft of femur fracture was around 1-9%.<sup>(1)</sup> The diagnosis of femoral neck fractures are frequently missed during initial assessment due to more focus of femoral

shaft fractures and diversion by treatment of life-threatening injuries. Bennett et al.<sup>(2)</sup> found a delayed diagnosis rate of 31% and Swiontkowski found a rate of 19%.<sup>(3)</sup> The femoral shaft fractures can occur at any portion of the shaft, but

there is an increased incidence of mid shaft and ipsilateral femoral neck fractures. This accounts for approximately 52% to 80%.<sup>(4)</sup> The shaft fracture, in contrast to femoral neck fracture is often open or comminuted or both due to the high energy absorption. The goal of any treatment plan should be anatomical reduction of the neck fracture and stable fixation of both the fractures, so that the patient can be mobilised earlier.<sup>(5)</sup> There are hardly any literature regarding outcomes of ipsilateral neck and femur shaft fracture. The purpose of this study is to evaluate the clinical outcome and complications following management of Ipsilateral neck and shaft of femur fracture by various fixation methods.

## Aim

To assess the functional and radiological outcome of ipsilateral neck with shaft of femur fracture.

## 2 Materials and methods

This is a prospective study done at Sri Ramachandra Medical College between April 2015 to Dec. 2018 in Department of Orthopaedics. The Inclusion Criteria were patients above eighteen years having ipsilateral neck with shaft of femur fracture. The exclusion criteria were Isolated shaft or neck of femur fracture and patients who lost follow-up and open fractures. We had totally eighteen patient as per our inclusion criteria. Three patients lost the follow up and datas were calculated based on the fifteen patient who had full follow up. The minimum follow up was taken as one year. Patients age group were between 24 years to 58 years with an average of 40 years. There were 11 male patients and 4 female patients. All the patients in our study had closed ipsilateral neck with shaft of femur fracture. The mode of trauma in eleven patients were high velocity road traffic accident while four sustained fracture from falling from height. Six patient had left sided fracture while nine had it on their right. Eight patients out of fifteen had associated fractures along with the ipsilateral neck and shaft of femur fracture. Six of the neck fracture were undisplaced basicervical fractures. There were 9 minimally displaced fractures with seven basicervical and two transcervical. Shaft fractures consisted of eleven Winquist grade 0 and four Winquist grade 1 levels of comminution. All the patients were followed by Modification of wilde et al Neer scoring system for outcome.<sup>(6)</sup>

Uniform fixation of fractures were not possible and different types of implants were used based on the merit of individual fractures. All the patients underwent surgery within 24hrs to maximum of nine days. All patients were given antibiotics post operatively for 5 days. Drain removal was done on 2nd post-operative day. Suture removal was done on post-operative day 12 to 14.

Patients were advised Non weight-bearing activities for 6 weeks. Partial weight-bearing activities were advised for

another 6 weeks. Radiological and functional examination was done 3 weeks, 3 months, 6 months and 1 year. Complete healing was defined as radiologically complete bone regeneration at the fracture site and a pain free patient with full weight bearing on the injured limb. Delayed union was defined as absence of healing 3 months after the operation. Non-union was defined as absence of healing 6 months after the operation.

## 3 Results

The results of the study were analyzed using modified wilde et al Neer scoring system. The duration of follow up range between 9 months to 18 months with an average of 12 months. The average time interval between the injury and the surgery was 5 days. The average intraoperative time in our study was 161 minutes. The operating time included from positioning the patient. In our study, the mean blood loss was found to be 257ml. At the most recent follow-up of 15 patients, the average flexion of the hip was 100 degrees and knee was 110 degrees (Range from 90 to 120). As per Modification by Wilde et al of the Neer scoring system we had excellent results in five patients, seven patients had good and 3 patients had fair results. There was no poor result in any of our cases. In our study 67% of the cases had no complications. The complications were tabulated in table 2. The Average time of union of the fracture was 25 weeks. All the fractures were united in our study.

**Table 1: Outcome as per Modified Wilde et al scoring system**

Result	No	Percentage
Excellent (16-20)	5	33
Good (11-15)	7	47
Fair(6-10)	3	20
Poor(1-5)	0	0

**Table 2: Complications**

Components	No.	%
Knee Stiffness	2	17
Limb Shortening	1	8
Infection	0	0
Heterotrophic ossification	1	8
No complications	11	67
Non union	0	0

## 4 Discussion

Internal fixation of ipsilateral neck and shaft of femur fractures gained widespread acceptance recently as implants and technology had improved. The main principle in the fixation is that it restores the anatomical alignment and allows early mobilization of the patient and the limb. Factors favouring healing in combined ipsilateral neck and shaft of femur fracture were minimal gap, adequate stability and sufficient vascularity.<sup>(7)</sup> Ipsilateral neck with shaft of femur fracture were more common in young individuals, predominantly male, sustaining high velocity injuries. Several methods of fixation have been described and controversy exists regarding the best approach. The neck fracture and shaft fracture union rate in our study was 100%. Randelli<sup>(8)</sup> and Hossam<sup>(9)</sup> showed similar result of 100% union rate of femoral neck and shaft in their studies. Other studies by Jain<sup>(10)</sup>, Kao<sup>(11)</sup> and Tsai<sup>(7)</sup> have also reported neck fracture union rates above 91% which were tabulated in table 3. Kao had reported 31% shaft fracture non union in his study with 13 patients in 2006. Recent studies<sup>(12,13)</sup> have also shown 100% union rate in spite of initial displacement. It is easier to maintain reduction in minimally displaced fractures. But achieving reduction in displaced and comminuted fractures is challenging even for the most experienced hands.

**Table 3- Comparison of our study to various studies:**

Authors	No	Union rate (%)		Union time (months)		Follow up (Yrs)
		Neck	Shaft	Neck	Shaft	
Randelli	27	100	100	3.7	4.8	2
Hossam	9	100	100	4.2	6.9	2.1
Jain	23	96	83	4	5.5	2.5
Kao	13	95	69	3	8.5	1.8
Tsai	32	91	78	4	8.8	1.9
Wiss	33	97		-		1.2
Our study	15	100		6		1

Wiss et al have reported that at the most recent follow-up of the thirty-three patients, the average knee flexion was 110 degrees. No FFD was found in his study. Less than 90 degree flexion was found in 2 patients. Winkquest et al. have noted an average of 135 degrees in a study with 20 patients. In our study with 15 patients, 5 patients had 120 degrees of flexion and 2 patients had 90 degrees of flexion. The average knee flexion in this study is 110 degrees. With 1-year follow-up of 15 patients in our study, there were no cases of osteonecrosis of femoral head. Randelli and Jain showed 4% of osteonecrosis with a follow-up of more than 2 years. Due to dissipation of most of the energy to the femoral shaft in these ipsilateral fractures, the avascular necrosis of the femoral head is very much less when compared with isolated neck of femur fracture.

Winkquest et al. recorded that in six patients had shortening between 1-1.5 cms. This shortening did not prove symptomatic in any of the patients. In our study, we had 2 patients with 1 cm shortening of the limb following surgical fixation but patients were not symptomatic and did not affect the functional outcome. Wiss et al. recorded two cases of malunions with varus angulation of 15 degrees. Donaldwiss et al reported varus/valgus angulation in 14 cases out of 112 unstable comminuted femoral shaft fractures. Kempf and Grosse reported 8 cases of varus angulation in 52 cases. In our study, we had 1 case with valgus deformity and 1 case of varus deformity. Although these angulations were noted, these were asymptomatic for the patients.

## 5 Conclusion

In our short term study of 15 patients, we were able to obtain satisfactory results with minimum complication rate. We had several set-backs in our patients; delayed time interval before surgery, need for open reduction in order to achieve alignment in most cases, but in spite of these set-backs, we were able to achieve excellent results in terms of neck union and shaft union. In Ipsilateral neck and shaft fractures, most neck of femur fractures are undisplaced or minimally displaced. Since our sample size is small, the appropriate treatment method cannot be commented with this study.

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