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## Assessment of outcome of results of fixation with 3 cancellous screws versus 2 cancellous screws and fibular graft in femur neck fracture

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### Abstract

**Background:** Fracture neck of femur in young people is caused by high energy trauma. The present study was conducted to assess outcome of results of fixation with 3 cancellous screws versus 2 cancellous screws and fibular graft in femur neck fracture.

**Materials and methods:** 48 cases of Garden type III and IV fracture neck of femur of both genders were divided equally (24) into 2 groups. Group I patients were treated with fixation with 3 cancellous screws and group II patients with versus 2 cancellous screws and fibular graft. Parameter such as mode of injury, operative blood loss, time of surgery, time to union, Harris hip score and Kyle's criteria and complication.

Ns in each group was recorded

**Results:** Group I had 12 males and 12 females and group II had 13 males and 11 females. Mode of injury was RTA seen in 16 and 15, fall in 5 and 7 and violence in 3 and 2, intra- operative blood loss (ml) was 67.4 and 70.2, time to union was 12 weeks seen in 3 and 3, 12-20 weeks in 7 and 9 and 20-24 weeks in 11 and 10 and 6 months- 1 year in 3 and 2, Harris hip score and Kyle's criteria found to be excellent in 14 and 18, good in 2 and 6 and poor in 8 and 0 in group I and II respectively. The difference was significant ( $p < 0.05$ ). Common complications were superficial infection in 3 and 1, non-union in 1 and delayed union in 2 and 1 in group I and II respectively. The difference was significant ( $p < 0.05$ ).

**Conclusion:** 2 CC screws with fibular graft is an alternative in fixation of femoral neck fracture and it provides an osteogenic environment, structural support, and biological healing with less complications.

**Keywords:** Kyle's criteria, femur, cancellous screws

### Introduction

Fracture neck of femur in young people is caused by high energy trauma and treatment of these injuries remains nightmare for surgeons because of high incidence of avascular necrosis (AVN) of femoral head and non-union of fracture. Due to precarious blood supply of femoral head, the incidence of AVN ranges from 0% to 67%. Non-union in femoral neck fractures have been reported in as many as 43% of the patients and up to 59% in one series. As these fractures are intracapsular, presence of angiogenesis inhibiting factors in synovial fluid and absence of cambium layer is said to be responsible for non-union.

Various treatment options of femoral neck fractures include Smith Peterson's nail, angled blade plate, dynamic hip screw, single or multiple cancellous screws with or without valgus osteotomy. Different types of bone graft can be used like muscle pedicle (quadratus femoris, sartorius, gluteus medius), free fibular graft (single, dual grafts), vascularized fibular graft.

Preservation of the femoral head in this age group has been the priority. Hence, internal fixation is the treatment of choice for displaced femoral neck fractures in younger patients and preferred by most surgeons over arthroplasty in Garden type III & type IV femoral neck fractures as it has less infection risk, mortality risk, less operative time, less blood loss. The present study was conducted to assess outcome of results of fixation with 3 cancellous screws versus 2 cancellous screws and fibular graft in femur neck fracture.

## Materials and Methods

The present study comprised of 48 cases of Garden type III and IV fracture neck of femur of both genders. All gave their written consent for the participation in the study.

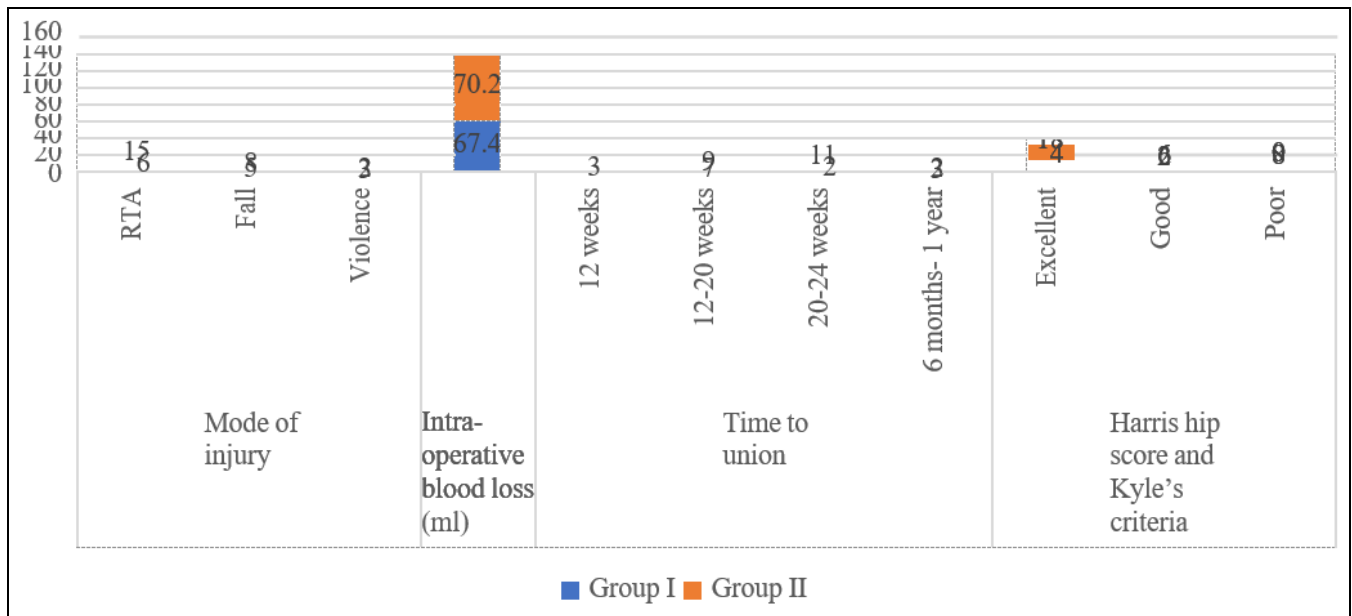
Data such as name, age, gender etc. was recorded. Patients were divided equally (24) into 2 groups. Group I patients were treated with fixation with 3 cancellous screws and group II patients with versus 2 cancellous screws and fibular graft. X-ray of pelvis with bilateral hip AP view & involved hip lateral view was taken. Parameter such as mode of injury, operative blood loss, time of surgery, time to union, Harris hip score and Kyle's criteria and complications in each group was recorded and compared. Data thus obtained were subjected to statistical analysis.  $p < 0.05$  was considered significant.

## Results

**Table 1:** Distribution of patients

Groups	Group I	Group II
Method	3 cancellous screws	2 cancellous screws + fibular graft
M:F	12:12	13:11

Table 1 shows that group I had 12 males and 12 females and group II had 13 males and 11 females.



**Fig 1:** Comparison of parameters

**Table 3:** Complications in both groups

Complications	Group I	Group II	p-value
Superficial infection	3	1	0.05
Non-union	1	0	

Table 3 shows that common complications were superficial infection in 3 and 1, non-union in 1 and delayed union in 2 and 1 in group I and II respectively. The difference was significant ( $p < 0.05$ ).

## Discussion

Neglected femur neck fractures in young people although rare in developed countries, are still seen in the developing countries [7]. Poverty, poor health-care facilities in remote areas, treatment by traditional bone setters, and lack of education are contributing factors. There are no definite guidelines to define neglected

**Table 2:** Comparison of parameters

Parameters	Variables	Group I	Group II	p-value
Mode of injury	RTA	16	15	0.92
	Fall	5	7	
	Violence	3	2	
Intra-operative blood loss (ml)		67.4	70.2	0.81
Time to union	12 weeks	3	3	0.74
	12-20 weeks	7	9	
	20-24 weeks	11	10	
	6 months-1 year	3	2	
Harris hip score and Kyle's criteria	Excellent	14	18	0.01
	Good	2	6	
	Poor	8	0	

Table 2, Figure 1 shows that mode of injury was RTA seen in 16 and 15, fall in 5 and 7 and violence in 3 and 2, intra-operative blood loss (ml) was 67.4 and 70.2, time to union was 12 weeks seen in 3 and 3, 12-20 weeks in 7 and 9 and 20-24 weeks in 11 and 10 and 6 months-1 year in 3 and 2, Harris hip score and Kyle's criteria found to be excellent in 14 and 18, good in 2 and 6 and poor in 8 and 0 in group I and II respectively. The difference was significant ( $p < 0.05$ ).

fracture [8]. Sometimes, surgeries were delayed due to late presentation of patients (more than 1 week of trauma), overflow of patients (unavailability of OTs), and to correct comorbid conditions (anemia, hypertension, diabetes mellitus, etc.) [8, 9]. The present study was conducted to assess outcome of results of fixation with 3 cancellous screws versus 2 cancellous screws and fibular graft in femur neck fracture.

We observed that group I had 12 males and 12 females and group II had 13 males and 11 females. Nagi *et al.* [10] found that 21 utilized fibular graft for the management of 26 femur neck fractures, 16 being old (>3 weeks) while 10 new cases (<3 weeks). They achieved union in all except for one. 4 patients had changes of AVN initially which improved clinically and radiologically after the treatment. No new case was notified with AVN after the treatment. Closed reduction was not possible after 3 weeks.

We found that mode of injury was RTA seen in 16 and 15, fall in 5 and 7 and violence in 3 and 2, intra-operative blood loss (ml) was 67.4 and 70.2, time to union was 12 weeks seen in 3 and 3, 12-20 weeks in 7 and 9 and 20-24 weeks in 11 and 10 and 6 months- 1 year in 3 and 2, Harris hip score and Kyle's criteria found to be excellent in 14 and 18, good in 2 and 6 and poor in 8 and 0 in group I and II respectively. Khani *et al.* [11] included 15 patients with neglected femur neck fracture treated with fibular bone graft. Fractures were classified according to Sandhu Classification. Hip function was assessed using Harris hip score. Results: Fifteen patients with mean age of 28.67 years were managed. Mean period of delay from injury to presentation was 3.07 months. Mean follow-up was 18.5 months. Union was achieved in 13 cases. 2 patients developed non-union with progression of avascular necrosis (AVN). Patients with healed fracture did not show radiological signs of AVN till the past follow-up. Functional status was evaluated at 6 months according to Harris hip score and was poor in 2 patients, fair in 2 patients, good in 6 patients, and excellent in 5 patients. We observed that common complications were superficial infection in 3 and 1, non-union in 1 and delayed union in 2 and 1 in group I and II respectively. Barua *et al.* [12] in their study 26 patients of the 18-60 years age group with Garden type III and IV fracture neck of femur of 1- 3 weeks old were included. Each group of 13 patients were treated with 3 CC screws and 2 CC screws with fibular graft respectively. The mean duration of surgery and intraoperative blood loss was more in fibular graft cases (80 minutes; 90 mL) than cases of CC screws (55 minutes; 60 mL). Mean time to fracture union was 22.75 weeks in CC screws cases and 15 weeks in fibular graft cases ( $P=0.028$ ). Good and excellent results (Harris hip score and Kyle's criteria) were obtained in 56% cases of CC screws and in 100% cases of fibular graft. 4 cases treated with CC screws had non-union ( $P=0.025$ ). 2 CC screws with fibular graft is optimum alternative in fixation of femoral neck fracture presenting late as it provides an osteogenic environment, structural support, and biological healing with minimal complications. The limitation the study is small sample size.

### Conclusion

Authors found that 2 CC screws with fibular graft is an alternative in fixation of femoral neck fracture and it provides an osteogenic environment, structural support, and biological healing with less complications.

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