

ORIGINAL ARTICLE

FUNCTIONAL OUTCOME OF DELAYED PRESENTING FRACTURE NECK OF FEMUR MANAGED BY CANNULATED SCREW AND FIBULAR GRAFT

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Background: Delayed presenting Fracture neck of femur is one of the complex and challenging fracture to treat. Multiple treatment options are available with varying results. This study was conducted to assess the functional outcome of fracture neck of femur seeking medical attention several days after injury that are managed by cannulated screw and fibular. **Methods:** A total of 35 patients were included in the cross-sectional study performed at orthopaedic surgery department of United Medical & dental college Karachi. Adults aged 18 years and over both male and female with fracture neck of femur presenting 14 days after the injury for medical treatment were included in the study. Ethical approval was obtained from the ethical review committee and patients who provided written informed consent were included in study. Data analysis was performed through SPSS version 20. **Results:** Thirty-five patients with fracture neck of femur of both sexes 25 (71.4%) male and 10 (28.6%) females were included in study. out of which 14 (40%) of the patients had sub-capital fracture and 21 (60%) patients had trans-cervical fracture neck of femur. Mean age of patients was 32.14±10.20 years. Twenty-eight (80%) patients out of 35 had excellent and good outcome, 4 (11.4%) cases had fair and 3 (8.5%) had poor outcome **Conclusion:** Cannulated screw fixation along with non-vascularized fibular graft is effective technique to management of delayed presenting fracture neck of femur as it is easy, inexpensive and does not require any special instrumentation or expertise

Keywords: Neck of femur fracture; Cannulated screw fixation; Fibular graft; Avascular necrosis (AVN).

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INTRODUCTION

Fracture neck of femur accounts for 3% of all the fractures.¹ It occurs most commonly in elderly population due to osteoporosis while in young due to high energy trauma and mostly presents in young as poly-trauma patient.² Being the intra-capsular fracture, it is considered as one of the orthopedic emergencies and should be dealt as soon as possible usually within 6 hours of injury to preserve the vascularity to head of femur.³ Multiple treatment options are available and are being tried such as fibular graft, muscle pedicle grafting, different osteotomies in order to preserve the head of femur.⁴⁻⁶ Definitely for the fracture neck of femur the principle being the good reduction and stabilization to get the desired results of preserving the head of femur and decreasing the complications that is non-union and avascular necrosis.⁷ Fibular graft, being the cortical graft provides greater stability to the construct along with other properties of graft such as osteoinduction and osteoconduction leading to union of the fracture⁸, preventing osteonecrosis⁹ and helping in preventing the collapse of femoral head^{5,10}.

The main reason for conducting the research was to assess the results of these type of injuries who seek medical attention several days after fractures and

were managed by cannulated screw fixation and non-vascularized fibular grafting at our institution.

MATERIAL AND METHODS

The cross-sectional study was performed at department of orthopedic surgery United Medical & Dental College and Creek General Hospital Korangi Karachi over a period of 2 years from June 2017 to June 2019. A total of 35 patient's adults aged 18 years and over both male and female with fracture neck of femur presenting 14 days after the injury for medical treatment were included in the study. Non probability consecutive sampling was used for the study. Patients with open fracture, any infection near the site of surgery, any evidence of septic arthritis, pathologic fracture, previous fracture around the hip joint, any history of osteonecrosis of the affected hip, ploy trauma patient were excluded from the study. Radiological assessment was done by AP view and lateral view of the hip. Ethical approval for the study was taken from the Ethical review board and informed consent was taken from the patients for participation into study. Procedure was performed on elective list under regional anaesthesia, lateral approach was used to expose the proximal femur, after anatomical reduction was held with the help of k- wires. Guide wire passed into

femoral head, after measurement triple reaming of dynamic hip screw done. Fibular graft of same size as measured by guide wire was harvested from the same side and placed over the guide wire into femoral head, cannulated screw of 6.5 mm placed into the femoral head and reduction of fracture, fibular graft and cannulated screw placement was assessed under image intensifier in antero-posterior and lateral position. Range of movement exercises were started on the 2nd postoperative day and patients were assessed regularly after 4 weeks. Partial weight bearing was started at 6 weeks and full weight bearing allowed at full union of fracture. Functional outcome was measured through Harris hip score after 6 months of surgery. SPSS version 20 was used for the analysis of data. Data was evaluated in terms of mean and frequency for age, sex, side of injury, type of fracture, mode of injury, duration of fracture, duration of union, operative time and Harris hip score. Shapiro-wilk test was used to assess the normality of data and chi square test was applied to functional outcome.

RESULTS

Thirty-five patients with delayed presenting fracture neck femur were included in study. 25 (71.4%) of them were males and 10 (28.6%) of them were females. Mean age of the patient in our study was 32.14±10.20 years. Right side was involved in 20 patients (57.1%) and left side was involved in 15 (42.9%) patients. With respect to type of fracture 14 (40%) of the patients had sub-capital fracture and 21 (60%) of the patients had trans-cervical fracture neck of femur .24 patients (68.6%) out of 35 were due to road traffic accident while 11 cases (31.4%) were due to fall. mean duration of fracture from injury to presentation for medical treatment was 22.43±5.42 days. with respect to total duration of surgical procedure mean operative time was 71.43±7.92 minutes. Union time in patients in our study was 19.31±5.02. Mean score in terms of Harris hip score was 84.02±12.59. Excellent and good outcome was achieved in 28 (80%) cases, fair and poor outcome was achieved in 4 (11.4%) and 3(8.6%) cases respectively. With respect to complication 29 patients (82.9%) were free of any sort of complications, superficial infection

was seen in 3 (8.6%) cases, non-union developed into 1 (2.9%) case. AVN of femoral head was observed in 2 (5.7%) cases.

Table-1: Descriptive statistics

Variables (n=35)		Mean±SD/ Frequency
Age (years)		32.14±10.20
Gender	Male	25 (71.4%)
	Female	10 (28.6%)
Side of injury	Right	20 (57.1%)
	Left	15 (42.9%)
Type	Sub capital	14 (40%)
	Trans cervical	21 (60%)
Mode of Injury	RTA	24 (68.6%)
	Fall	11 (31.4%)
Duration of Fracture (Days)		22.43±5.42
Operative Time		71.43±7.92
Union time (weeks)		19.31±5.02
Harris Hip Score (HHS)		84.02±12.59

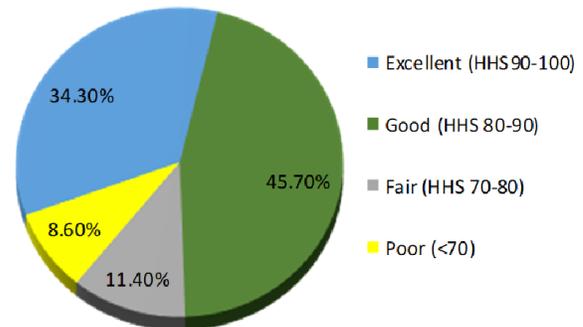


Figure-1: Functional outcome

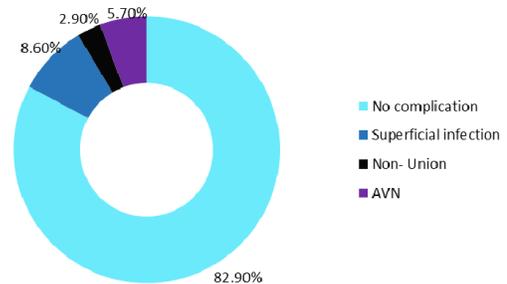


Figure-2: Complication

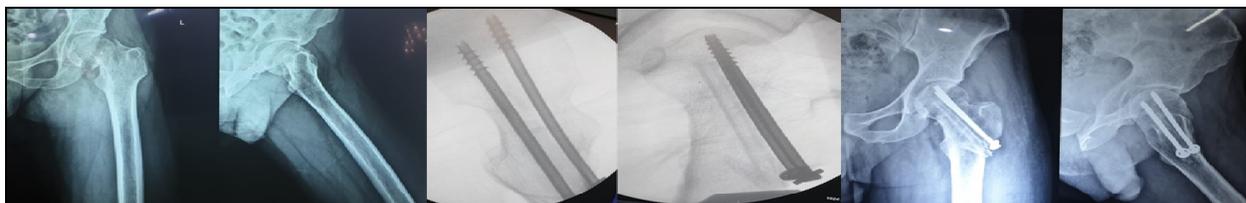


Figure-3: FNF managed by cannulated screws and fibular graft –preop and postop X-Rays

DISCUSSION

Delayed presenting fracture neck of femur remains the major challenge in terms of treatment and its importance lies in the fact that it does require revision of surgical treatment in about 30% of cases.¹¹ Study shows that delay in treatment of about 1 week of femur neck fractures increases the chances of complications and even to avoid these problems additional intervention is required in forms of different bone grafting procedures and osteotomies to salvage the head of femur.¹² Preserving the head of femur in young population in patients presenting late for the medical management is extremely difficult option.¹³ Closed reduction should be priority when managing these fractures as it is associated with decreased blood loss, morbidity, and decreased chances of injury to vascular supply to head of femur lying at the level of head of femur and decreased time duration when compared to open reduction.^{14,15} Triangular shape of fibula besides stabilizing the fracture also prevents the rotation and in one way acts like biological smith Peterson nail, along with it being the cortical strut bone graft it provides mechanical stability and promotes union of fracture.¹⁶

In our study excellent outcome was achieved in 34.30%, good outcome was achieved in 45.70%, fair in 11.40% and poor outcome in 8.40% patients. One patient in our study developed non-union fracture neck of femur whereas study conducted by other authors Zahid¹⁷, Mishra¹⁸ and Nagi¹⁹ showed that union in their series was 82%, 92% and 95% respectively. Study conducted by Arun gopalakrishnan *et al*²⁰ showed AVN in 7.4% of cases where as our study showed AVN in 5.70% of patients. with respect to union time in fracture neck of femur managed by cannulated screw and fibular graft different authors such as Roshan¹³, Nagi¹⁹, Azam²¹, and Xie²² in their study showed that mean time to union was 19.2 weeks, 5.2 months, 16.7 weeks and 4.4 months respectively which was comparable to our study that was 19.31±5.02 weeks.

With respect to complications study by Nagi *et al*²⁰ showed that 4 patients had non-union and 5 patients had avascular necrosis of femoral head, Azam *et al*²² in their study have shown that 3 patient had non-union and 6 patients had AVN, in our study majority of patients were free of complications, 3 patients developed superficial infection which did not required any further intervention and were managed by antibiotics, 1 patient had non- union and 2 patients developed

avascular necrosis of femoral head. Results of our study were almost comparable with other authors in comparison of union time, complications and functional outcome.

CONCLUSION

Delayed presenting fracture neck of femur is nightmare for orthopedic surgeons because of its prognosis. Effort should be made to preserve the femoral head and this delayed presentation sometimes makes reduction of these old fractures extremely difficult and it's directly proportional to outcome of fracture neck of femur. Closed or open reduction and fibular graft is essentially a precious technique especially for these sorts of delayed presenting fracture neck of femur.

AUTHORS' CONTRIBUTION

Conceptualization of Study Design: Masroor Ahmed, Muhammad Bux. Data Collection: Masroor Ahmed. Data Analysis and Data Interpretation: Mukesh Kumar, Naveed Ahmed. Drafting of Article: Masroor Ahmed. Literature Search: Masroor Ahmed, Muhammad Bux. Proof Reading: Ghulam Hussain, Naveed Ahmed

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