



## A STUDY TO EVALUATE CLINICAL OUTCOMES IN PATIENTS OF AGE BELOW 50 YEARS WITH INTRACAPSULAR FRACTURE OF NECK OF FEMUR TREATED BY CANNULATED CANCELLOUS SCREW FIXATION

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**ABSTRACT** Intracapsular femoral neck fractures are commonly seen in the elderly population after a trivial fall. However, femoral neck fractures in adults younger than 50 are uncommon and often result from high-energy trauma. They account for only 2-3% of all femoral neck fractures. It is crucial to understand and contrast the differences between elderly and young adult patients to evaluate and treat femoral neck fractures. Characteristic differences are seen for the osseous and vascular anatomy, the mechanism of injury, associated injuries, fracture pattern, and treatment goals. Femoral neck fractures in young adults are associated with higher incidences of femoral head osteonecrosis and nonunion. The rate of osteonecrosis reported in the literature ranges from 12-86% in young patients after femoral neck fracture. This devastating complication may lead to the collapse of the femoral head and subsequent osteoarthritis. Reoperation and salvage procedures such as osteotomy have high failure rates, and arthroplasty procedures are not ideal given the young age and higher activity levels. This study attempts to evaluate the internal fixation of intracapsular fracture of the neck of the femur with multiple cannulated cancellous lag screws. Patients selected for this surgery were between 15 to 50 years old with intracapsular fracture of neck of femur who were admitted and treated in Kurnool Medical College and Hospital, Kurnool, A.P., from October 2019 to October 2021.

**KEYWORDS :** Intracapsular fracture of neck of the femur, Cannulated cancellous screws, Avascular necrosis, Nonunion, Open reduction & Internal fixation.

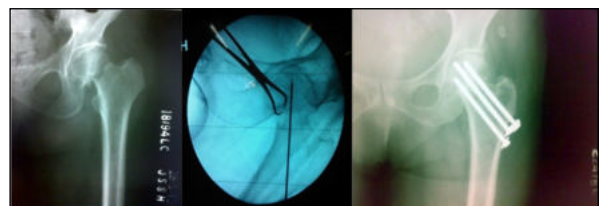
### INTRODUCTION:

Fracture of the neck of the femur is a severe traumatic condition, as it comprises more than 50% of hip fractures, which mainly occur in the elderly after falls. Fracture of the neck of the femur has a one way presented significant challenges to orthopaedic surgeons and remain in many ways today as unsolved fracture as far as treatment and results are concerned. As life expectancy increases each decade, our society is becoming more and more geriatric, with a significant increase in the number of hospitalised and nursing home patients suffering from femoral neck fractures and their sequelae. However, femoral neck fractures in adults younger than 50 are uncommon and often result from high-energy trauma. They account for only 2-3% of all femoral neck fractures. It is crucial to understand and contrast the differences between elderly and young adult patients to evaluate and treat femoral neck fractures. Characteristic differences are seen for the osseous and vascular anatomy, the mechanism of injury, associated injuries, fracture pattern, and treatment goals. Femoral neck fractures in young adults are associated with higher incidences of femoral head osteonecrosis and nonunion. This study attempts to evaluate the internal fixation of intracapsular fracture of the neck of the femur with multiple cannulated cancellous lag screws. Patients selected for this surgery were between 15 to 50 years old with intracapsular fracture of neck of femur who were admitted and treated in our institution.

### MATERIALS & METHODS:

This study carried out in the department of Orthopaedics, Kurnool medical college and hospital during October 2019 to October 2021. Patients included in the study are age below 50 years irrespective of gender and fresh intracapsular fracture of neck of femur without comminution. Patients with pre-existing hip lesions such as osteonecrosis and degenerative osteoarthritis, old nonunion and malunion fractures and neurological disorders are excluded. All the patients were preoperatively assessed to classify the fracture type by "Garden's Classification" and prepared for surgery. A total of 60 patients were treated after accurate reduction and rigid internal fixation. All surgeries were carried out on an elective basis using standard aseptic precautions; most of the cases did under spinal anaesthesia only; a few cases did under general anaesthesia. Patients placed supine on fracture table with a radiolucent perineal post placed between the patient's legs. Closed reduction was done by Leadbetter maneuver under image intensifier control. A lateral longitudinal

incision is made just inferior to the vastus lateralis ridge and extended distally for approximately 5cm. Fascia lata and vastus lateralis fascia were split in the line of incision. Guide wires introduced into the femoral neck using image intensifier to guide the position. The neck of the femur is drilled by using 4.5mm cannulated drill bit with drill sleeve over the guidewires. The screws are selected so that that thread engages only proximal fragment. Three cannulated cancellous screws tightened over the guidewire in parallel manner after tapping the near cortex. Guides wires removed and wound closure done in layers with a suction drain in situ. Drain removed after 48 hours. Patients were made to sit upright on 3<sup>rd</sup> POD and encouraged to do Quadriceps and hamstrings exercises. Patients advised to mobilized weight bearing as tolerated. Suture removal done on 10<sup>th</sup> POD. Serial radiographs and functional assessment done on follow up visits at 6weeks, 3 months and 6 months.



**Figure 1:** A 42yr Male Patient With Displaced Fracture Neck Of Femur, Preoperative, Intra Operative And Postoperative Radiographs.

### OBSERVATIONS & RESULTS:

In our study, the maximum age was 50 years in males and 49 years in the case of females. The majority of the patients were 30 – 50 years, with a mean age of 30.15 years for males and 34.28 years for females. There were 39 male patients and 21 female patients; this shows a preponderance of males over females.

The right hip is more often fractured than Left hip. There were 42 patients with fracture on the right compared to 18 patients with fracture on Left side. Majority (24) (40%) of fractures were Garden type III on radiographic examination. There were 18 patients with Garden type II fracture, 9 patients with Garden type I fracture, and 9 patients who had Garden type IV fracture. Majority of the patients had minimal trauma; most of them slipped and fell on flat ground or in the bathroom. Three of them were hit by vehicles. The patients in our study had various

medical problems. Hypertension, anaemia and diabetes mellitus were the most common problems. They were seen by the physician in the early period of hospitalisation and were given necessary treatment. The patients were taken for surgery only after they became fit for the surgical procedure. 90% (54) of patients are operated on within 2 weeks. The remaining patients had long preoperative hospital stays because of their associated medical problems and delayed presentation and were operated on after treating and controlling the associated medical disorders by appropriate medications. The majority (39) of patients had no complications; 7 of them had AVN, 9 had screw loosening, 5 had Nonunion.

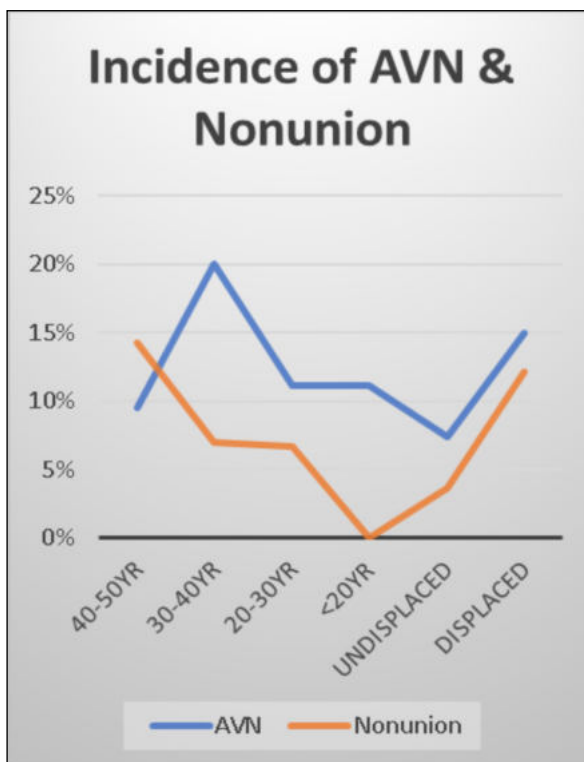
**Table 1: Demographic Data Of The Patients:**

Variables		Frequency
Age	40-50yr	21 (35%)
	30-40yr	15 (25%)
	20-30yr	9 (15%)
	<20yr	15 (25%)
Sex	Male	39 (65%)
	Female	21 (35%)
Side	Right	42 (70%)
	Left	18 (30%)
Garden's Classification	I	9 (15%)
	II	18 (30%)
	III	24 (40%)
	IV	9 (15%)
MOI	Self fall	51 (85%)
	RTA	9 (15%)
Comorbidity	Nil	30 (50%)
	Anemia	12 (20%)
	HTN	9 (15%)
	DM	6 (10%)
	HTN+DM	3 (5%)
Preoperative Hospital stay	1 week	39 (65%)
	2 weeks	15 (25%)
	3 weeks	6 (10%)
Complications	None	39 (65%)
	AVN	7 (11.7%)
	Screw Loose	9 (15%)
	Screw Penetr	0
	Nonunion	5 (8.3%)

**Table 2: Assessment Of Functional Results:**

Variables		Frequency
Pain	None	12 (20%)
	Slight	27 (45%)
	Mild	15 (25%)
	Moderate	6 (10%)
	Marked	0
Use of Support	None	39 (65%)
	Cane for long	12 (20%)
	Cane mostly	6 (10%)
	One crutch	3 (5%)
	Two canes	0
Walking Distance	Unlimited	36 (60%)
	6 blocks	15 (25%)
	2-3 blocks	6 (10%)
	Indoors	3 (5%)
	Bed & Chair	0
Limp	None	12 (20%)
	Slight	13 (65%)
	Moderate	6 (10%)
	Severe	3 (5%)
	Ability to put on Shoes	Ease
Difficult		6 (10%)
Unable		3 (5%)
Stairs Climbing	No Rail	42 (70%)
	With Rail	9 (15%)
	Any manner	6 (10%)
	Unable	3 (5%)
Use of Public transport	Yes	51 (85%)
	No	9 (15%)
Sitting	Ord chair	51 (85%)
	High chair	9 (15%)

Absence of Deformity	Yes	54 (90%)
	No	6 (10%)
HHS	Poor	9 (15%)
	Fair	6 (10%)
	Good	18 (30%)
	Excellent	27 (45%)
Duration for radiological union	Three months	39 (65%)
	Four months	9 (15%)
	Six months	7 (11.7%)
	Nonunion	5 (8.3%)



**Figure 2: Incidence of AVN & Nonunion**

**DISCUSSION:**

Fractures of the femoral neck are increasing exponentially due to the longevity of the general population. It is classically described fracture in osteoporotic elderly patients. It has a strong predominance in postmenopausal women. Although relatively uncommon in both children and young adults, it is usually the result of high energy trauma if present in this age group. In elderly patients with an already weakened bone, even minimal trauma can cause a fracture. A fractured neck of the femur is often referred to as a fragility fracture. Management of fracture of the femoral neck remains a major and challenging undertaking for an orthopaedic surgeon. The pendulum is swinging between reduction and internal fixation with various supplementary methods as osteosynthesis to total hip replacement. In Western countries, such cases are treated by total hip Arthroplasty because of the style and religious requirements. The people in our country are more interested to squat or sitting in cross legged position. In addition to the cost factor, the movements required are not possible with total hip replacement.

It is therefore required by all means that one should preserve the original hip joint. In this context, we undertook this study to evaluate the immediate results of internal fixation using the 6.5mm A.O. Cannulated Cancellous Screws in fracture neck of the femur keeping in view the living condition of an average Indian. In our study, the maximum age was 50 years in males and 49 years in the case of females. Majority of the patients were grouped in 35-50 years with a mean age of 30.15 years for males and 34.28 years for females. Other authors report age distribution as Saxena & Saraf<sup>1</sup> (1978) had 75 age distribution 45-90 years (Mean 66 years); Mukherjee & Puri<sup>2</sup> (1986) 65 years, Arwade<sup>3</sup> (1987) 54-86 years with an incidence between 70-80 years (Average 72 years). Bavadekar and Manelkar<sup>4</sup> (1987) had mean age group in fresh fractures was 75 years, whereas in old cases, it was 62 years. In our study, the intracapsular fracture of the femoral neck

was more common in males and also found a difference in the mode of injury between men and women as fall from heights and RTA were responsible in men and fall on the same level caused fractures in female. Male predominance is reported in several series: D'Acry and Devas<sup>5</sup> (1976): 91.4%; Mukherjee and Puri<sup>7</sup> (1986): 58.3%; Amte & Sanchetti (1987): 55%; Bavadekar and Manelkar<sup>4</sup> (1987): 60.9%. There were 7 (11.7%) cases of AVN reported in our study. The reasons and risk factors associated with developing AVN may be attributed to vascular damage from the initial femoral neck fracture, poor quality of reduction or fixation, and elevated intracapsular pressure. Major incidence is reported in age group 30-40 years (20%) and in displaced fractures (15%). Phemister<sup>6</sup> first reported incidence of AVN in 10 – 20% in Undisplaced fractures and 15 to 35% in displaced fracture. Ratliff reported an incidence of 42% (30 of 70 cases) while Allende-Lezama 25% (2 of 8 cases), Carrel and Carrel 35% (4 of 11 cases), Ingram and Bachinsky 55% (13 of 24 cases), Mc Dougal 58% (14 of 24 cases). There were only 5 cases (8.3% incidence) of nonunion reported in our study probably due to the improper positioning of the implant where the threads of one of the screws were not crossing the fracture site. Major incidence is seen in age group 40-50years (15%) and displaced fractures (12%). This incidence is much lower as compared to that reported in other series. The marked contrast between the functional and radiological results is mainly because of the pain and limp, which form major criteria in the Harris hip scoring system, thus bringing down the number of good and excellent results in our study. Since pain and limp were present in most of our cases, none were severe enough to demand any secondary surgical procedure except for screw removal in case screw loosening.

#### CONCLUSION:

In our study, the total Harris hip score at the end of six months ranged from 31.85 to 99.80. 27 (45%) patients had hip scores from 90 to 100 (excellent). 18 (30%) had hip scores 80 to 89 (good). 6 (10%) were rated 70 to 79 (Fair), and 9 (15%) were rated less than 69 (poor). Thus 85% of the hips were classified as having a satisfactory to excellent result, and 15% of the patients had a poor result. The poor results in our study were due to slight to moderate pain in the hip or thigh and limp after Internal fixation and were found more commonly in patients who had screw loosening. We did not emphasise on the exact parallel placement of screws in our study nor the number of screws, although these satisfactory results were seen in our study, which is also supported by other studies (E.M. Toh<sup>7</sup> et al. and K. Guruswamy et al.<sup>8</sup>). The success of Internal fixation depends on preoperative planning and proper attention to surgical details to achieve the optimum biomechanical conditions. In conclusion, Osteosynthesis with cannulated screws fixation provides the patient with a healed fracture with a living femoral head that is always better than a replacement and less invasive procedure than arthroplasty. In patients with treatment failure, total joint replacement or hemiarthroplasty can still be performed with better results than primary hemiarthroplasty. Internal fixation of femoral neck fractures is a good option in younger adults. The mortality and morbidity rates are less than prosthetic replacement and have high rates of union. The operative procedure is simple, economical, complications are less disabling, and early functional results are satisfactory.

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