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Femoral neck fractures though common in occurrence and known since time immemorial has always been posing challenge to Orthopaedic surgeons as the proper management of femoral neck fractures has been starring the surgeons mind since long. The existence of so many procedures of management, itself proves that none of them is perfect. The last word in its management is yet to be said.

The higher incidence of femoral neck fractures, in old age is well a established fact (Frangakins 1966; Barnes 1976; Brown 1976; Garden 1976; Preston & Nicoll 1976), while our observations showed the higher incidence in early age group (41-50 years) which is in contradiction to the established fact. (table-1). This can be partly explained by table 3 which, shows that about 1/3rd of patients are victims of road traffic accident. Number of these patients is much higher (36.66%) than the usually reported incidence of less than 5% (Hedlund and colleagues).

In most of Western studies, the females show a higher incidence of femoral neck fractures as compared to males (Stromquist 1983; Svenningson 1984; Linde 1986). Key and
Conwel (1961) mentioned that it is usually because of the fact that neck shaft angle is females is lesser and neck of femur is smaller than in males.

In the present study 56.67% of patients were males and 43.33% were females.

Males have always exceeded females in most of the studies conducted in India (Kulkarni 1987; Babulkar 1987). This variation in the pattern of sex incidence can be correlated with the fact that Indian women are mainly restricted to household activities, where as a male is more exposed to trauma in the outdoor activities. This also explains our observations of higher incidence of road traffic accident (36.66%) as the cause of neck femur fracture.

Slipping on the floor, road traffic accidents and fall from the height were the usual causes of injury. Commonest being fall on the floor, which is supporting the findings of this study (table-3) and the same fact has been observed by Aitken 1984; Christodouton N.A.; Dretakis E.K. 1984.

There was no predilection of side of the injury and both side were equally involved (Trucata 1957; H.P. Boyal 1964; J.T.
Brown 1964 and Garden 1976) while in this study (table-4) right side fracture (60%) are more common then left (40%).

Majority of cases in this study (93.33%) was of Garden’s grade III & IV type. (Table-5) These findings are in accordance with observations made by majority of surgeons (Boyd 1969; Smyth 1964; Mayer 1963; William 1984).

In this study majority (73.33%) of cases (table-6) belong to trans-cervical type of fracture, which is most common type of fracture, as suggested by other observers also.

In the present study the evaluation of each group had been carried out separately as pre-requisite of particular group of surgery is not same in all the three groups.

**Evaluation of group A (Cannulated hip screws).**

Amongst the three common classification of femoral neck fractures, based on anatomical location of fracture, obliquity of fracture and degree of displacement of fracture fragments, only Garden’s classification (Garden 1974) based on the degree of displacement in pre-reduction X-rays is useful to the surgeon. It is more important in cases in which internal fixation is planned. In the study of this group-
• 2 cases were of Garden's type II

• 2 cases were of Garden's type III

• 6 cases were of Garden's type IV

Although it has been demonstrated that rotational mal-reduction may escape attention on routine anteroposterior and lateral roentgenograms, these have become the standard for clinical analysis.

We assessed quality of reduction of fracture according to Garden's alignment index-

a) Good - 155-180°

b) Fair - ± < 10°

c) Poor - ± > 10°

In this study of ten cases, six had good alignment (60%), three had fair alignment (30%) and one had poor alignment (10%) in which AVN is seen.

The rate of AVN correspond to that observed by others (Fredsen et al 1984; Svennigsen et al 1989; Nordkild & Sone Holm 1984).
The patients werssse followed at 6 weeks interval and results were evaluated using the criteria of Larsen (1963), which, is based on functional scoring, evaluating functions of hip, presence of pain, gait, deformity and range of movement.

Supported walking with graduated weight bearing was permitted after 6 weeks of surgery. Full weight bearing was not allowed till radiological consolidation, in cannulated and osteotomy cases.

In this study observations is similar as reported by Jewett E.L. 1941; Nieminen B.E. 1970 and Pugh W.L. 1955, Modson et al 1967; Wood et al 1991.

Ninety percent cases of this group were free from any complication at final follow up. There was no limb length discrepancy in any case, except one in which AVN is seen. These observations are similar to others Protozmon et al 1976; Swintkownki, Winquiste, Honsen 1984, Dedricke et al 1986; Gray Parker 1994; Lu-Kao et al 1997.

In this study non-union did not occur in any case because of good reduction, rigid internal fixation and supervised physiotherapy. We have observed that fixation with multiple
cannulated screw is associated with low mortality, morbidity and rate of avascular necrosis, risk of nonunion is also reduced.

Finally, results of this study are comparable to other studies
ASNIS 96%, Hough et al 98%, Wood et al 90%, Retinberg and Olerad 100%, Goutam et al 92%, Medson et al 89%

*Evaluation of group B (Mc-Murray’s Osteotomy) cases-

In the present study, 10 cases of femoral neck fracture were treated by intertrochanteric osteotomy, fixed with wain-wright plate or one and half hip spica depending on general condition of patient. All the cases of this group were operated after 3 weeks except one, which was operated on 20th day, after injury.

Male female ratio was 2.33 to one. Youngest was 20 years old and eldest was 65 years of age. The age and sex of patients of this study is consistent with that of other Indian studies of Mishra (1979); Mehrotra (1982); Goel et al (1980); Rollen & Srivastava (1976). Invariance with reports published in western countries Mc-Murray (1938); Reich (1941), Cleveland Bailey (1950); Mc-Meur (1953); where the average age of patients is higher and females outnumber males. In our country, males, especially below 60 years of age, earn livelihood for their families and belong to lower
socioeconomic group. This usually involves hard manual labour, thus increasing the male population with relatively lower age group.

In our country, patients usually attend hospital late. In one of selected patients the injury was even more than two months old and had been initially treated with repeated vigorous manipulations and massage. This is again similar with the findings of other Indian studies.

Mc-Murray (1965); Dickson 1947; Green (1967); Mishra (1979); Mehrotra (1982); Chaturvedi and Gupta (1969) recommended intertrochanteric osteotomy. Just above the lesser trochanter with medial displacement of distal fragment, thus shifting the line of weight bearing more medially to convert shearing forces in compressive forces at the fracture site. In this series osteotomy was done just above the lesser trochanter with medial displacement.

All patients were able to sit on chair, squat and able to sit crossed legged, except one in which wain-wright plate protruded through greater trochanter. This patient was able to perform most activities but with mild pain. In all these cases osteotomy site had united but fracture was not united till 24th week. All the cases
suffered from limp due to shortening for which they were advised to wear shoes with raised heel.

Nine patients were able to perform Trendlenberg test, one was unable to perform the test because of pain, which was due to protruded plate.

Finally functional status of patients were conducted by Larson’s scoring, which shows 9 cases (90%) had good functional status, while 1 case (10%) had poor result.

Thus we can say that intertrochanteric osteotomy leads to definite increase in stability of the hip and functional status without interfering the hip movement and pain, when conducted carefully. Functional results of the present study had been compared favorably with those of Mc-Murray (1938); Reich (1941); King (1950); Petric (1950); Gupta and Chaturvedi (1973); Goel et al (1986).

**Evaluation of Group C (Arthroplasty) cases**

Prosthetic replacement for fracture neck femur is well documented procedure since 1922 (Hey Groves). This study was conducted in 10 patients of fracture neck femur, the average age of these patients was 69.70 years, the range being 62 to 75 years
(table-1). In this series the average age was comparable to that of 
Campbell’s (1980) and Anderson (1964) who had average age of 72 
years and 65.5 years respectively.

Most patients of this group were female (70%) as compared 
to male (30%). Similar findings were reported by Anderson (1967); 
Campbell (1960); probably of postmenopausal osteoporosis 
(Kulkarni 1987) in elderly females.

According to anatomical classification in majority of cases, 
the type of fracture was trans-cervical (70%), similar finding was 
also reported by Shahane (1987).

Average period of post-operative hospitalization was 2 weeks, 
with regular follow up at 6 weeks interval till six months.

AT final follow up pain and limp was present in 30% patients. 
Though the pain and limp in replacement arthroplasty occurs 
commonly, Whittaker et al (1972) put forward view that pain was 
due to osteolysis. Saxena and Saraf (1978) thought that the level 
of excision of bone from neck portion altering the abductor 
mechanism plays the part causing pain.

Other late complication like osteolysis, settling heterotrophic 
ossification, fracture of femoral shaft at end of prosthetic stem and
protusio acetabulae, are not observed in this series due to short period of follow up.

Larson's score was used to calculate final functional evaluation of patients. 70% cases had good results 10% had fair result while 20% had poor result. One patient died within 6 month of follow up. Similar results are also observed by Devas and Hinves (1983); Bowmen et al (1985), Saxena and Sarof (1978); Kumar and Singh (1980).

Although it is difficult to compare the results of three different treatment modalities in fracture neck femur because they have different indications and age group, but few characteristics can be compared, as shown in adjacent table.

All cases of this study in which cannulated screw or osteotomy was performed belong to lesser age group (<60 years), most of them were male with the ratio of 3:1. Most common cause of injury in arthroplasty cases is a fall on ground, while in other two groups are road traffic accidents.

Rate of complications is more in cases of hemiarthroplasty (20%) as compared to Mc-Murray’s osteotomy and cannulated, 10%
each, 30% of cases of arthroplasty had pain while 10% patients of other two groups suffered from pain.

Earliest weight bearing can be performed in arthroplasty cases even on second post-operative day, while weight bearing was delayed till 6 weeks in cannulated and osteotomy cases.

Limb length disparity is seen in all cases of osteotomy due to shortening, while in other two groups no length disparity is present except in one case of cannulated screw in which Avascular necrosis is present.

Limp is observed in all cases of osteotomy due to shortening, while 3 cases of arthroplasty and 2 cases of cannulated screw suffered from limp.

Squatting and sitting crossed leg was achieved well in all cases of arthroplasty and cannulated screw cases, while we had not advised, to squat in cases treated by hemiarthroplasty.

10% mortality had been observed in hemiarthroplasty group while no mortality was observed in cannulated screw or osteotomy case.

The final follow up, was done at 24 weeks. Larson’s functional scoring, showed 30% excellent, 60% good and 10% poor
results in group A. 90% good and 10% fair results were observed in group B patients, while 70% good and 10% fair results were obtained in group C but 20% of group C patients had poor results.