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### **Cannulated screw fixation of fracture of neck of femur. Whether Asian hip can accommodate three screws**

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#### **Abstract**

Asian neck of femur is smaller in diameter when compared to westerners hips, which can accommodate three or four screws. This study was conducted in the aim to establish Asian hips cannot accommodate more than 2 screws. A total number of 20 cases of displaced intracapsular fractures of femoral neck were treated by asnis screw fixation. All the cases were followed up for a period ranging from 6 months to one year. The results were analysed clinically and radiologically. In 14 cases fractures united as evidenced by trabecular growth across fracture site. 6 cases went for non-union.

**Keywords:** Fracture neck of femur, Cannulated screw fixation, Number and positioning of screws

#### **Introduction**

Fractures of neck of the femur is one of the commonest and most disabling injuries sustained by the elderly. The intracapsular fractures are "Unsolved Fractures" by Dickson because of the complications encountered during management. With the improved standards of living, life expectancy has been increased in India also. With the Considerable population of Senior citizens in whom these fractures are common due to senile osteoporosis. In the treatment part, the burning question is whether to use prosthesis or Screws?.

Most of the devoted advocated of primary prosthetic replacement agree that best prosthesis is inferior to soundly united fracture in good position. Hence it would be defeatist attitude to decapitate, for the favour of prosthesis. Considering the complications like loosening, proximal femoral fractures, dislocation, deep sepsis, morbidity and mortality of prosthetic replacement, rigid internal fixation after accurate reduction would be the best choice of treatment for femoral neck fractures. Intracapsular fractures of garden I and II heals uneventfully with fracture fixation device we normally use. It is grade III & IV displaced fractures, usually lead to complications like delaying union, non-union, avascular necrosis and late segmental collapse after reduction and internal fixation. Therefore this challenging, common and controversial problem of treatment of displaced fractures the femoral neck was chosen for Publication topic, to analyse the result of 20 cases, following fixation with Asnis cannulated hip screws.

#### **Materials and Methods**

20 cases of displaced intracapsular fracture neck of femur were selected from patients in the age group of 20-50 years.

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**Fig 1:** Showing screws being inserted in the medullary neck AP& Lateral views and positioning on table with traction

### Mode of Violence

Domestic fall- 6

Road traffic Accidents – 11

Fall from Tree -2

Wall collapse – 1

The age group ranges from 12-60 years with an average of 34 years. We have chosen comparatively young adults mostly from Road Traffic Accident cases for asnis screw fixation

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SEX:

Male: Female ratio in this study = 13:7

All the fractures chosen were garden's Grade III & IV

No of patients	GR.III	GR.IV
20	11	9

Most of the cases are admitted at the day of injury. 5 cases were admitted after a delay of one week.

Most of the cases in our study were operated late due to assessment problems and associated injuries period ranging from 8 days – 47 days, with an average of 19.6 days.

Closed reduction under X ray control were done in 15 cases.

All the cases were discharged after suture removal

### Technique

All the patients were Operated under spinal anaesthesia on fracture table. Closed reductions were done by lead better method. Check x rays of AP and lateral views were taken. Garden's alignment index for evaluation of reductions could not be used due to poor quality of lateral view x rays. Anatomical or near normal reductions were accepted for fixation with asnis screws. In 5 cases we were not able to achieve anatomical reduction. Hence open reductions were done.

Though a 10cm incision over lateral aspect of greater trochanter skin, subcutaneous tissue, deep fascia were incised. The origin of vastus lateralis muscle was erased at the base for greater trochanter on the lateral aspect to expose the bone. A guide wire was passed 1cm below the origin of vastus lateralis parallel to the floor, towards opposite anterior superior iliac spine, aiming to lie along the calcar and posterior and inferior aspect of neck. The position of guide

wire was checked with AP and lateral views. If the position is found to be satisfactory, another guide wire was passed above and parallel to the previous one, using the fixed angle guide. Reaming and tapping were done along the guide wires. Cannulated screws of appropriate sizes, measured from the length of guide wire outside the lateral cortex, were screwed in upto the subchondral bone along the guide wires. Second or third screws were inserted in a similar manner. Final positions of screws were checked with x rays wound closed in layers after obtaining complete haemostasis.

Open reductions were done in 5 cases by extending the proximal end of the above incision towards anterior superior iliac spine in Watson-Jones approach. Through the interval between gluteus medius and tensor fasciae latae the dissection is carried out proximally to incise the anterior capsule longitudinally along the anterosuperior surface of the neck of femur. Fracture fragments were manipulated to achieve anatomic reduction. Fixation was described earlier.



**Fig 2:** X ray showing the fracture healing and patients return to Preop activities

### Results

**Table 1:** Describing the functional activity & Radiological healing of fractures

	Functionally		Radiologically	
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory
No. of Cases	15	5	14	6
Percentage	75%	25%	70%	30%

All the 20 patients were evaluated clinically and radiologically at month intervals. The results in each patient was graded according to Metz *et al.* on the basis of functional and radiographic criteria.

A functionally satisfactory result was one in which the patient reached or surpassed his functional status prior to fracture. The necessity of a cane or other support other than merely for balance reduced the functional grading to unsatisfactory, as did persistent severe pain and an inability to weight bear on the involved limb.

Radiographically a satisfactory result was one in which AP x ray showed normal femoral head with union of the fracture. Unsatisfactory results were those in which the fracture line was persistently visible, cartilage space lost, acetabular changes were present or the normal femoral head and neck alignment altered.

Of the 20 cases, 15 cases (75%) had a good functional outcome and 14 cases (70%) had a good radiological union and were having an acceptable return to pre fracture level of activities (Table 1).

They started walking from 4<sup>th</sup> month. Radiological union occurred between 4- 6 months after operation (Fig 2)

### Discussion

Difficulty in taking a lateral view x rays can be overcome by placing the patient on fracture table and abducting the limb. A good quality of x rays are needed to plan the type of the treatment. If there is a posterior comminution, we can straight away proceed for muscle pedicle graft through a posterior approach. Highly osteoporotic bone with Singh's index more than 3 are unsuitable for internal fixation because the soft head of the femur in these cases does not hold metallic fixation rigidly. We have to plan hemiarthroplasty in these cases.

After initial radiological evaluation the fractured limb must be immobilised in flexion and internal rotation in a Thomas splint with skin traction, this should be operated within 24-48 hours.

Diameter of necks of femur in our Indian patients are narrower than westerners. Hence 3 or 4 screws as advised by Asnis cannot be introduced without crowding (Fig 1). This was confirmed by an experimental study performed using a few cadaveric femur bones. Indian version of Asnis screws vary in thread and core diameter. When we measured some of the screws using vernier caliper there were minor discrepancies in measurements which lead to poor purchase and loosening of the screw when we use the standard size tap. Bending of guide wires cause struck, while reaming and tapping leading to difficulty in the accurate placement of screws.

### Conclusion

In these unsolved fractures, we can get higher rates of union if we perfect our methods of treatment viz:

Speedy assessment including Tc 99 scan proper planning and early surgery with use of image intensifier for perfect reduction.

Three screws caused jeopardy to intraosseous medullary blood supply as sometimes the third screw breaches the outer cortex in the medullary canal which affects the medullary blood supply.

So considering narrow neck of our population, two parallel medullary screws should be ideal.

Better surgical skill with suitable implants and instruments.

Strict asepsis including laminar air flow and a supervised post-operative management with regular follow up.

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