MATERIAL
&
METHODS
MATERIAL AND METHODS

This study was conducted in the department of Orthopaedics, M.L.B. Medical College & Hospital, Jhansi. The patients were selected from those attending the emergency and out patient department.

All patients of femoral neck fracture, irrespective of age and duration of fracture, first ten cases of each treatment group were the subject of the study. The patients were divided into three groups depending on the methods used for treatment.

Group A- Patient who will be treated by internal fixation with multiple cancellous screws were included in this group.

Group B- Those patients who were treated by Mc-Murray’s Osteotomy, were included in this group.

Group C- Those patients who were treated by arthroplasty were included in this group.

Criteria for selecting patient in different groups

Group A – All fresh cases (<3weeks) irrespective of age except those included in groups B or C.

Group B
• All cases age less than 60 years with Garden type IV fracture and old cases (>3 weeks)
• Fracture that cannot be reduced satisfactory or fixed with stability and age less than 60 years.

Group C

• All cases with physiological age more than 70 years.
• Cases with Garden type IV with age more than 60 years and olds cases (>3 weeks)
• Failed cases of internal fixation
• Patient with pre-existing lesions of femoral head.
• Pathological fractures.
• Fractures with dislocation of head above the age of 60 years
• Patients who cannot withstand two operation
• Patients with psychosis and mental deterioration.

Preoperative management

1. Patient were clinically examined and admitted to the orthopaedics ward with long liston splint.
2. The below knee traction were given to each patient till waiting for surgery.

3. Routine laboratory investigation.

4. Radiological examination

Pre-anaesthetic check-up was done and all requirements of PAC clinic were full filled. Preoperative part preparation with thorough washing and shaving were done on day before surgery. Patients were fasted for eight to ten hours prior to surgery and intra-venous line started.

*Anaesthesia*- General/ Spinal/ Epidural anaesthesia were used in case according to suitability of patient.

*Patient position*- Patients were supine on fracture table.

Reduction- Closed reduction was tried by either of these methods.

- Whitman technique

- Lead Better technique

Evaluation of reduction was done by Garden’s Alignment index, using the trebecular pattern as viewed in both AP and lateral view.
If reduction is not satisfactory after second or third attempt then fracture were reduced under direct vision by open reduction through a "Watson Jones" approach in which usual lateral incision is extended proximally and anteriorly.

**SURGICAL TECHNIQUES**

**Group A – Internal fixation with multiple cancellous screws**

**Incision** – Thorough preparation were done after closed reduction. Skin is incised by lateral approach; fat fascia and muscles are separated by dissection.

Steps of screw fixation

1. Determine the anteverision of femoral neck by the placing a threaded guide wire on anterior aspect of the femoral neck.

2. The positioning guide wire were placed parallel to antevervision wire by drill, then other parallel guide wires were placed through one of the central diamond pattern position in holes.
3. Insert guide wire in to the subchondral bone at the femoral head through each of the outer triangle patterned placement holes.

4. Remove the parallel and positioning guide wires.

5. Using direct measuring device, determine the insertion depth of the three guide wires. To calculate drilling depth, subtract 10mm from the reading. To calculate cannulated screw length, subtract, 5mm screw head which remains outside of the near cortex.

6. In dense bone, place the 4.5mm cannulated drill bit and drill sleeve over the guide wire.

7. Pass the cannulated tap over the guide wire and tap the near cortex. In dense metaphysical bone it may be necessary to tap over the entire non threaded length at the guide wire.

8. Select a screw so that the thread engages only the opposite fragment using cannulated screw drives. Insert the large cancellous bone screw over guide wire. Confirm fracture impaction with x-rays.

9. Remove and discard guide wire repeat screw insertion technique for remaining screws.
Closure- Wound is closed in layers after leaving a suction drain inside.

**Group-B MC-Murray’s Displacement Osteotomy or high oblique Osteotomy**

**Incision** — Posterolateral (Watson-Jones) incision is depend through fascia lata and carried proximally to the interval between tensor fascia lata and gluteus.

**Steps**-

1. Muscles are separated along the direction of incision

2. The osteotomy site is from the base of greater trochanter laterally to a point just proximal to lesser trochanter medially.

3. Osteotomy plane is slightly oblique (10°-15°) from lateral distal to medial proximal.

4. Medial displacement of shaft is done and deformity is corrected.

5. Internal fixation is done.

6. Wound is closed in layers after leaving a suction drain inside.
Group-C Arthroplasty using Austin Moore prosthesis

Surgical method-

Incision – Using a Moore’s posterior approach

Steps –

1. Lateral position, the gluteus maximus is split and short external rotators are cut close to their incision.

2. The head is extracted using a corkscrew.

3. Head size is measured using a ring campus and confirm by placing it in the acetabulum.

4. The acetabulum is packed during reaming of the medullary canal.

5. A notch is made in posterior-superior portion of neck to maintain anteversion of 10-15.

6. The prosthesis is inserted into medullary canal by gentle hammering to seat it well over the calcar.

7. The prosthesis is reduced by gentle traction in the extended position of knee, without rotational forces.

8. Difficult reduction is achieved, using Murphy’s kid.
9. Stability is confirmed by putting the hip through a range of motion and traction.

10. The external rotators are attached to the greater trochanter and wound is closed over negative suction drain.

**Post Operative Management**

Post operatively no external splintage will be applied except in few case of osteotomy in which spica is applied instead of Wein Wright plate. Suction drain was removed within 24-48 hrs after surgery.

The isometric quadriceps exercises will be encouraged same evening or 2\textsuperscript{nd} post-operative day. Patient will be allowed to sit next day of surgery. Skin sutures are to be removed on 10\textsuperscript{th}-11\textsuperscript{th} day of surgery. Active hip exercises will be encountered earliest possible as per pain tolerance of the patients. Graduated weight bearing will be permitted after 6 weeks in cases of cannulated hip screws, 12 weeks in case of osteotomy, while in case of orthoplast, full weight bearing is allowed as the pain tolerance of patient is permit. However, full unsupported weight bearing will not be allowed before radiological consolidation of fracture or osteotomy site in case of cannulated and osteotomy cases respectively.

Follow Up:
In follow-up of all patients were called at 6 weeks interval and examined clinically and radiologically. The findings were recorded in working proforma as below-

**CLINICAL ASSESSMENT**-

**At 2 months**
- Condition of wound,
- Presence of pain
- Gain of power

**At 3 months**
- Condition of wound
- Presence of pain
- Ability to walk with supported
- Limb length discrepancy
- Range of movements
- Functional status
- Power of muscles around hip and knee
- Joints

**At 4th, 5th and 6th months**
- All above criteria with ability of patient to walk with crutches or unsupported
- Ability to squat and sit cross-legged
- Range of movements at hip joint
- Return of routine work

**Radiological assessment**

Was done at regular intervals of 1½ months to see-

1. Whether fixation was secured
2. Stage of union at fracture site
3. Extrusion of screws
4. Any evidence of absorption of neck of femur
5. Any sign of segmental collapse or avascular necrosis

The final results of function of hip were evaluated according to Larsen criteria given in 1963. It is a mathematical criteria, detailed below:

**A. Function (35 points)**

- Does most of house-work or job require moving about
- Dresses unaided in tying shoes and putting on socks
- Walks enough to be independent  
  5
- Sits without difficulty at table or toilet  
  4
- Picks up objects from floor by squatting  
  3
- Baths without help  
  3
- Negotiates stairs foot over foot  
  3
- Carries objects comparable to suitcase  
  2
- Gets into car or public conveyance unaided and rides comfortably  
  2
- Drives a car  
  1

B. Freedom from pain (35 points)
- No Pain  
  35
- Pain only with fatigue  
  30
- Pain only weight bearing  
  20
- Pain at rest but not with weight bearing  
  15
- Pain at sitting or in bed  
  10
- Continuous pain  
  0

C. Gait (10 points)
• No limp; no support 10
• No limp; no cane 8
• Abductor limp 8
• Short leg limp 8
• Needs 2 canes 6
• Needs 2 crutches 4
• Cannot walk 0

D. Absence of deformity (10 points)

• No fixed flexion over 30° 3
• No fixed adduction over 10° 3
• No fixed rotation over 10° 2
• Not over 1” shortening 2

E. Range of Motion (10 points)

• Flexion- extension (normal 140°)
• Abduction-adduction (normal 80°)
• External – Internal rotation (normal 80°)
The total score ninety and above will be considered as excellent, eighty to eighty nine as good results, seventy to seventy nine will be considered as fair results and less than seventy score will be poor results.