

***ORTHOPAEDIC TRAUMA BOOTCAMP***

***Femoral Neck Fractures in Younger Patients***

A. Vascular Disruption depends upon:

- Displacement,
- Fracture pattern,
  - Revascularization depends upon:
    - Maintaining uninjured arteries,
    - Avoiding further kinking and minimizing intracapsular pressures,
    - Achieving a prompt and stable reduction,.....

Main advantages of prompt reduction of a displaced femoral neck fracture are unlinking of the vessels and performance of an intracapsular decompression to remove the hematoma that increases intracapsular pressures..

Previous recommendations have suggested early surgery within 6 hrs of injury...can decrease the rate of femoral head osteonecrosis.

B. Timing

- AVN related to degree of displacement and capsular hematoma,
- Irreversible cell death after 6-12 hours,
- Therefore, most treat these fractures emergently or as an emergency with ORIF and capsular release,...DEPENDING ON TIME FROM INJURY AND ARRIVAL TIME TO YOUR INSTITUTION

***What is considered emergent timing???early fixation???***

C. Complications

- AVN – 20 to 90 %,
- Nonunion – 0 to 62%,
  - best results with early treatment, anatomic reduction, and multiple screw fixation,**
  - Post-traumatic osteoarthritis,
  - Infection
  - DVT / PE

D. Outcomes

Nikolopoulos KE, etal.

- Relatively high rate of avascular necrosis after delayed internal fixation of femoral neck fractures,

- Only a few of these patients (20%) required further surgical treatment in the follow-up period of this study.

Butt MF, et al

- Good to excellent functional outcome achieved in 45 cases.
- Delayed closed reduction and internal fixation of displaced fractures in young adults
- High rate of fracture union and good functional outcome.
- The rate of AVN, however, may be a concern if the patients are followed for a longer period.

Dedrick DK, et.al

- Femoral neck/subcapital fractures in young patients
- Nonunion (20%); avascular necrosis (36%).
- Subcapital fracture 83% developed nonunion or avascular necrosis
- 21% with true femoral neck fracture ( $p = 0.05$ ).
- There was no difference in cause of injury, overall injury severity, degree of comminution, displacement, method of treatment, or prior health status between those with and without complications.
- High rates of nonunion and avascular necrosis were seen after all types of femoral neck fracture in young adults, but most often associated with subcapital fracture.
- These complications of hip fracture appeared to be independent of health status, method of treatment, or mechanism or severity of injury.

Karaeminogullari O et.al.

- avascular necrosis 12.5% and nonunion 25%, for patients who underwent surgery under 12 hours.
- avascular necrosis 14% and nonunion 27% for patients who underwent surgery after 12hrs....NOT SIG.
- Avascular necrosis 6% and 18%, respectively, among patients with undisplaced (Garden stages 1 and 2)
- 23% and 38% among those with displaced (Garden stages 3 and 4) fractures.
- Outcomes consistent with degree of initial displacement...**not** timing to surgery

Upadhyay A. et.al.

- There was no significant difference between the groups in terms of union ( $p = 0.93$ ) and AVN at two years ( $p = 0.85$ ).
- Posterior comminution, poor reduction and improper placement of the screws were the major factors contributing to nonunion.
- The overall incidence of AVN was 16.3% (15 of 92 patients) and it was not influenced by these factors.
- A delay of more than 48 hours before surgery ***did not influence the rate of union or the development of AVN when compared with operation within 48 hours of injury***

#### Damany DS

- Incidence of NU was 50/564 (8.9%) and AVN was 130/564 (23.0%).
- There was a higher incidence of NU and AVN following displaced than undisplaced fractures.
- NU occurred more frequently after open reduction than closed reduction (10/89 [11.2%] versus 13/275 [4.7%]).
- There was an increased incidence of AVN after closed than open reduction but this was no longer statistically significant when one study with a markedly higher reported incidence of AVN was excluded.
- The difference in the incidence of NU and AVN following early (<12h) or late (>12 h) surgery was not significant for either NU or AVN.
- CONCLUSION: Early or open reduction of these fractures may not reduce the risk of NU or AVN.

#### Haidukewych GJ

- The ten-year survival rate of the native femoral head free of conversion to total hip arthroplasty was 85%.
- Osteonecrosis was the main reason for conversion to total hip arthroplasty, but not all patients with osteonecrosis required further surgery.
- 25% AVN in pts treated within 24hrs of fx
- 20% AVN in pts treated over 24hrs from fx
- The results of treatment *were influenced by fracture displacement and the quality of reduction.....surgical timing independent....*

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