

"Even a good Head is useless without a sound Neck" - underdiagnosed causes* and misinterpreted principles in the neck of femur fractures. (*systemic hypertension)

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Abstract - Neck of femur fracture is one of the most common geriatric fractures that is encountered in orthopaedics practice. We hereby present a case of middle-aged male with neck of femur fracture on whom salvage of head was done using standard cannulated Cancellous screw fixation. However, in spite of good fixation the neck went for nonunion and eventually replacement was done. This warranted us to re-look and re-invent certain current principles and understanding of treatment of neck of femur fractures.

Keywords: Neck of femur; biological age; chronology age; systemic hypertension

CASE REPORT -. A 48-year-old active male was brought to casualty in November 2021 with alleged history of slip and fall in bathroom. Based on clinical and xray evaluation he was found to have a neck of femur fracture right hip(fig-1). He was a known case of systemic hypertension maintained on Losartan 50 mg OD. Other than this there was no known comorbidities. The individual was prof of OMFS dept who was involved actively in all activities prior to injury. A CT scan evaluation was done. And emergency fixation was done with 3 standard technique of cannulated Cancellous screws to prevent AVN hip. Intra op CArm image is below and was satisfactory(fig-2). Post op was uneventful and standard immobilization protocol was followed and during partial protected weight bearing patient complained of pain and discomfort. Follow up xray was taken and found ccs back out laterally (fig-3)



Fig1

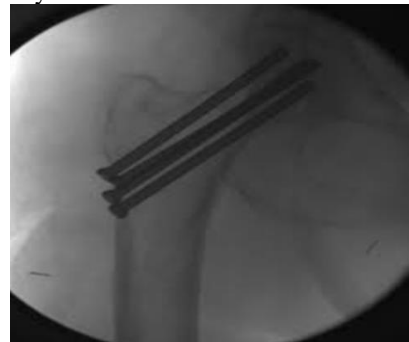


Fig-2



Fig3



Fig4

Considering the failing implant and non-union, next plan of arthroplasty was planned and THR (Fig4) was done. Post op nil special and patient was mobilized successfully. Considering the fact that inspite of a good fixation, the neck failed, we analysed the reasons and derived at certain observations.

Discussion -**Principle 1- chronological age vs physiological age**

While analyzing the case we understood the existing principle of salvaging the head in young adults have to be revisited . The physiological age is more important than the chronological age . Therefore for example even in 70 year old patient if physiological age is 50 then we can preserve head . This rule should also be understood and interpreted in reverse, for example 48 year old patient with 70 year physiological age should be taken up for replacement without looking at chronological age and attempting salvage.

Principle 2- All neck of femur fractures occurring in and around house (trivial trauma) are pathological (osteoporotic) unless proven otherwise.

This is also one of the important principle to be understood, any fracture with trivial trauma example like slip and fall in bathroom no matter how young aged an adult is should always be considered pathological (Osteoporotic) unless proven otherwise. As in our case considering the age 48 , and good pre-injury activity level of patient we did not think osteoporosis as a possible cause .

Principle 3- All osteoporotic neck of femur fractures should go for replacement of head and never fixation.

This is a very controversial area as osteoporotic bones also go through normal steps of fracture healing however there is only a slowing in healing process. But the "neck" is a special area where in-principle "biomechanics is more important than biology", meaning even if head is sound, the osteoporotic neck will fail not biologically but biomechanically!

Principle 4- Unknown etiologies and underdiagnosed causes of osteoporosis.

In our patient we could only find systemic hypertension as a comorbidity and no other known risk factors for osteoporosis. When we did further study in to the matter we found studies from AHA (American Heart Association) proving not only association but also the exact molecular mechanism of how systemic hypertension causes osteoporosis.

Conclusion -

From our case report we arrive at these conclusions. All neck of femur fractures occurring in and around the house (trivial trauma) are pathological/osteoporotic no matter what the age of the patient is . All osteoporotic neck of femur fractures should undergo replacement and never fixation no matter whatever the age of patient is . Systemic hypertension is a proved cause of accelerated osteoporosis, similarly various other unknown etiologies of osteoporosis may be hidden and therefore it is essential now to stick to these principles in management of neck of femur fractures.

Conflicts of Interest: “The authors declare no conflict of interest.”

REFERENCES:

- 1) Lil-Sofie Ording Müller et al. *Pediatr Radiol.* 2019 Jun.
- 2) Agreement Between Chronological Age and Bone Age Based on the Greulich and Pyle Atlas for Age Estimation: A Systematic Review -Pål Skage Dahlberg et al.
- 3) Bone mineral density according to age, bone age, and pubertal stages in korean children and adolescents-Jung Sub Lim et al. *J Clin Densitom.* 2010 Jan-Mar.
- 4) Bone age as a correction factor for the analysis of trabecular bone score (TBS) in children-Miguel Angel Guagnelli et al. *Arch Osteoporos.* 2019.
- 5) Fixation failure in femoral neck fractures-Lance S Estrada et al. *Clin Orthop Relat Res.* 2002 Jun.
- 6) Timing of internal fixation of femoral neck fractures. A systematic review and meta-analysis of the final outcome-Costas Papakostidis et al. *Injury.* 2015 Mar.
- 7) Femoral neck fractures in patients over 50 years old-P Simon et al. *Rev Chir Orthop Reparatrice Appar Mot.* 2008 Oct.
- 8) Association between hypertension and fragility fracture: a longitudinal study-S Yang et al. *Osteoporos Int.* 2014 Jan.