

**Avascular necrosis of left femoral head following trivial trauma and the need
for early Magnetic Resonance Imaging**

ABSTRACT

Trivial Trauma is one of the causes of avascular necrosis of the femoral head. Even trivial trauma can cause loss of blood supply to the femoral head and results in ischemia and aseptic necrosis. A 68 year old male patient came with 2 month history of left hip pain. X-ray pelvis (fig-1) with both hips which was taken immediately after the trauma, showed no significant bony abnormality and patient was managed conservatively with analgesics. Patient had persisting pain for 2 months which increased in severity and patient developed difficulty walking. Therefore an Magnetic Resonance Imaging (MRI) L hip (fig-2) was done and which showed avascular necrosis grade III of left femoral head. Total hip replacement was then carried out for the patient and patient improved symptomatically. Earlier MRI imaging following trauma could have resulted in early diagnosis and intervention to prevent progression of the disease and salvage the femoral head.

Keywords: Avascular necrosis, traumatic, total hip replacement, hip pain.

1. INTRODUCTION

Avascular necrosis is aseptic death of a segment of the femoral head. Traumatic avascular necrosis occurs due to severance of blood supply to the femoral head due to trauma which results in ischemia and death of bone. Dead bone is structurally and radiographically similar to live bone on plain radiograph, however lacking blood supply it does not undergo renewal after a period of repetitive stress it collapses. Therefore by the time the patient presents the lesion is often

well advanced. Therefore the reliable method of picking up early signs of osteonecrosis is by MRI (Solomon et al., 2014). Written consent was obtained from the patient to publish the clinical and radiological data.

2. CASE PRESENTATION

68-year-old male patient presented with a 2 month history of hip pain. Patient gives alleged history of minor trauma; patient had missed his footing while crossing a foot bridge and twisted his left hip. Patient initially had mild left hip pain. A plain radiograph of pelvis with both hips (fig-1) showed no significant abnormality and patient was managed conservatively with painkillers. Gradually over the course of two months pain increased in intensity and patient also developed difficulty walking. Patient gives no h/o steroid or alcohol intake. On examination of the left hip, generalized tenderness was present over the left hip and movements were painful and restricted. Differential rotation or sectoral sign was positive in the left hip. MRI L hip (fig-2) which showed avascular necrosis of left femoral head, grade III under modified Ficat and Arlet Radiological (Ficat 1985) staging with necrotic index of more than 50%.

Anaesthetic fitness was obtained and patient was posted for left total hip replacement. Under spinal anesthesia with patient in right lateral decubitus position after dissecting skin and sub-cutaneous tissue. A 12cm curved incision was made extending proximally to PSIS and distally to the shaft of femur via the posterior approach. Tensor fascia lata and gluteus maximus muscle split and retracted. Short external rotators cut and retracted. Capsule was visualized and T-shaped incision was made to open the capsule. Hip joint was dislocated by internal rotation. Neck was osteotomized with the help of a saw. Head removed with the help of a cock screw and was measured to be 49mm. Acetabular labrum was resected. Serial reaming of acetabulum was

done (40-52mm). Trial acetabular implant of size 52mm was placed and hold of the trial implant was found to be satisfactory. A 52mm acetabular implant was placed and fixed with 6.5mm x 30 mm screw in the poster superior quadrant. Acetabular liner of size 52mm placed. Serial reaming of femoral medullary canal done with femoral stem size 8 to 12mm. Femoral stem of size 12mm and head of size 28(+5) was placed. Hip joint relocated by external rotation. Range of motion and stability was checked and found to be satisfactory. Wound was closed in layers over a drainage tube with sterile dressing.

3. DISCUSSION

This patient had persisting hip pain for a period of 2 months. Patient had a history of minor trauma 2 months back. Plain radiograph was taken and found to be normal. There can be a delay of 1-5 years between onset of symptoms and appearance of findings in plain radiographs (Stoica et al., 2009). MRI was taken 2 months after the trauma due to persisting pain and difficulty walking and the patient was diagnosed with grade III avascular necrosis and patient was treated surgically with THR. Post-operatively patient reported relief of pain and mobility was restored.

-An earlier MRI taken in the week or next following the trauma could have resulted in an earlier diagnosis of avascular necrosis. MRI is a sensitive and specific method for early diagnosis of femoral head necrosis (Kalunian et al., 1989). In avascular necrosis of femoral early diagnosis and intervention with head preserving procedures like core decompression is crucial in preserving the femoral head and obviating or postponing head replacement procedures (Pierce et al., 2015). Head preserving procedures earlier in the course of avascular necrosis can aid in decreasing the morbidity and mortality from the disease. In this patient as the patient gave only a history of trivial trauma and as earlier plain radiograph was normal, MRI was not taken. This resulted in progression of the disease and the need for a replacement surgery. This underscores

the need for early magnetic resonance imaging even in cases of trivial trauma if pain persists beyond a week as avascular necrosis might be the etiological factor behind the pain; Avascular necrosis is such a disease that if it is not diagnosed early on plain radiographs and diagnosis later in the course of the disease results in replacement procedures which come with high morbidity and mortality and potential need for revision arthroplasty surgeries if done in young patients (Garino et al., 1997).

4. CONCLUSION

Avascular necrosis should be suspected in patients with persisting hip pain even post trivial trauma. A normal x-ray cannot diagnose avascular necrosis in early stages and a MRI scan is indicated. In this patient MRI scan revealed a grade III avascular necrosis which necessitated a total hip replacement. An MRI scan earlier following the trauma could have diagnosed avascular necrosis at an earlier stage and an earlier intervention like a core decompression which would have helped preserve the femoral head and reduce the morbidity and mortality for the patient.

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Case Illustration:

Fig1 X-ray Pelvis with both hips

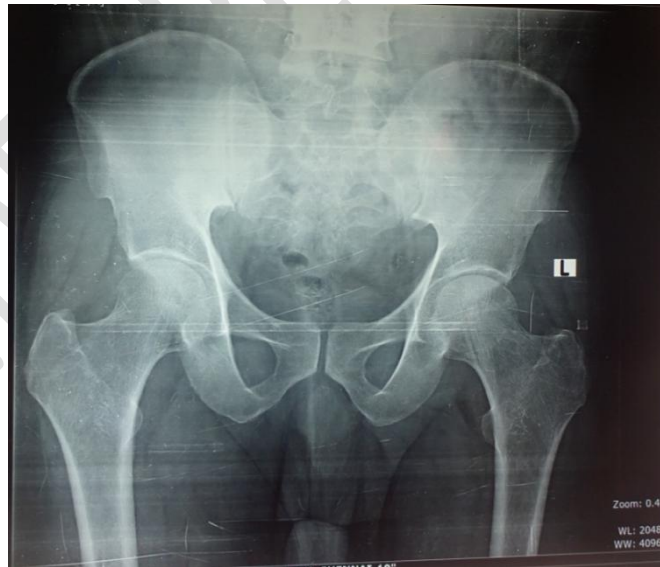


Fig2 MRI-Left hip: showing avascular necrosis of left femoral head

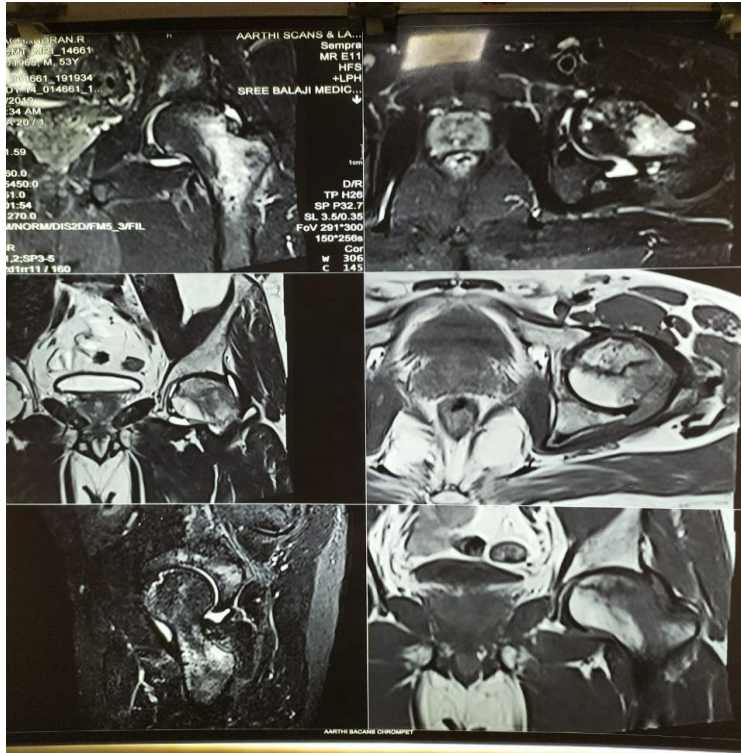
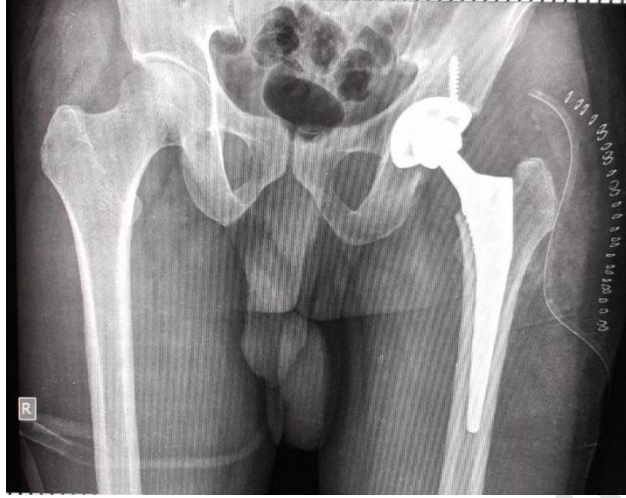


Fig 3 – Post-op X-ray- Pelvis with both hips AP view: showing the THR implant in situ.



UNDER PEER REVIEW