



Journal Homepage: - www.journalijar.com
**INTERNATIONAL JOURNAL OF
 ADVANCED RESEARCH (IJAR)**

Article DOI: 10.21474/IJAR01/4010
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/4010>



RESEARCH ARTICLE

OSTEONECROSIS OF FEMORAL HEAD: OUTCOME OF CORE DECOMPRESSION WITH CANCELLOUS BONE GRAFTING.

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Manuscript Info

Manuscript History

Received: 23 February 2017
 Final Accepted: 09 March 2017
 Published: April 2017

Key words:-

Avascular Necrosis (AVN), Femoral Head, Core Decompression, cancellous Bone graft, Harris Hip Score (HHS), Visual analog pain score (VAS), Alendronate.

Abstract

Background: Osteonecrosis of femoral head results in femoral head collapse in 75-85 % of untreated patients. It is debilitating diseases which frequently progressing to femoral head collapse and secondary osteoarthritis of hip joint. Treatment of choice is total hip replacement in end stage of diseases. But it commonly affects males between age group of 20-40 years. Hence in younger age group patients total hip joint replacement is not ideal option in early stages of osteonecrosis. So there was need of study the efficacy of decompression of femoral head and bone grafting with cancellous bone.

Material and Method: A prospective analytic study of 70 hips in 50 cases was done. 50 patients with osteonecrosis of femoral head treated between 2014 - 2016. All patients were evaluated clinically and radiologically. Selected cases were belonging to stage 1 and stage 2 modified Ficat and Arlet classification. We performed core decompression and cancellous bone grafting. Outcome was assed clinically with Harris hip score (HHS), Visual analogue score (VAS), and radiologically by x rays and MRI. MRI was done preoperatively to confirm the diagnosis and 3, 6, and 12 months post operatively for assessment of healing.

Results: Outcome was assed clinically with Harris hip score (HHS) and Visual analogue score (VAS). In our series of 70 hips in 50 cases, 22 hips had excellent, 28 hips had good outcome, 8 fair and 12 poor. All excellent and good patients returned to their prior activity. Progressive pain and progression of collapse seen in 20 patients having poor and fair results and they eventually ended up in total hip replacement.

Conclusion: We found that use of cancellous bone graft in the management of osteonecrosis of femoral head proved to be an excellent treatment modality. Procedure provides decompression of the avascular lesion, removal of necrotic bone and elevation of articular surface of head through core track

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Introduction:-

Osteonecrosis of femoral head is debilitating diseases. Etiology is unknown. However it is thought to be multifactorial. It results in femoral head collapse in 75-85% of untreated patients. Recent trend in treatment of

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osteonecrosis of femoral head aim is to preserve the joint in the early stages (Modified Ficat and Arlet classification) FAS 1, 2 and to delay the replacement surgery in advanced cases.

Principle of core decompression is it relieves intraosseous pressure caused by venous congestion, allowing improved vascularity and possibly slows down the progression of the avascular necrosis of femoral head. This study describes early results of treatment of avascular necrosis of femoral head by decompression and cancellous bone grafting.

Material and Methods:-

A prospective analytic interventional study was carried out from 2014 to 2016 in our institution, Department of Orthopaedics SBKS medical college and Dhiraj general hospital Pipariya, Vadodara, Gujarat .Total 50 patients (70 hips) in which diagnosis of osteonecrosis of femoral head was made clinical examination was performed in all patients revealed pain with range motion and ambulation. Limitation of internal rotation in both flexion and extension were found with passive internal rotation and extension being particularly painful. Further evaluation was done with plain x rays and MRI scan. Study group includes 50 patients. 35 males and 15 females. 20 patients (40 hips) with bilateral involvement and 30 patients with unilateral involvement. Bilaterally affected patients were operated in same sitting. Patients were staged according to modified ficat and arlet classification. All the patients belongs to stge 1 and stage 2 of femoral head osteonecrosis. The age of patients in study group ranged from 20 to 45 years the mean age was 32.5 years.

Operative Procedure:-

Under general anesthesia or spinal anesthesia , supine position on standard operating table. Percutaneous two guide wire was passed under guidance of image intensifier. Tip of guide wire was directed into the centre of most necrosed portion of the head of femur. After achieving proper insertion of guide wires in necrotic area of femoral head it was confirmed on AP and lateral view on image intensifier, then 3-5 cm incision was taken on base of the guide wire, fascia lata is splited in line of incision. Then guide wire over reamed with 6mm reamer. Then all necrotic material was qurrated out with qurret. Depressed articular margin was elevated and Cancellous bone grafting was inserted in the both tracts. Then wound was closed in layers.

Cancellous bone graft was taken from anterior iliac crest. Under general or spinal anaesthesia . A 3 to 4 cm incision is located over the iliac creast (contralateral side in unilateral cases) posterior to the ASIS to protect the lateral cutaneous nerve . After incision the skin and subcutaneous layers, sharply incise the white facial confluence of gluteal/tensor and abdominal musculature over the iliac crest and the periosteum. Periosteum is elevated with periosteal elevator and cancellous graft is harvested with bon gauge. And wound is closed layer wise.

Post Operative Cares:-

For the ASIS graft site compression bandage was applied until removal of sutures. Active range of motion exercise of knee and ankle started during the immediate postoperative period. partial weight bearing started after 6 weeks post operatively. Full weight bearing with walker started after 3 months. We have given alendronate to all patients post operatively.

Evaluation:-

Patients were followed up at 1 month, 3 months 6 months 1 year and one and half years and 2 years. Evaluation of the patients regards to pain, distance walk with or without support , climbing of stairs, sitting, squatting and clinically examined range of movements of hip using Harris hip scoring system, according to which the score <70 was poor, 70-79 –fair, 80-89 –good, 90-100 excellent. Follow up check x ray were taken.

Results:-

The patients had good clinical improvement with relief of pain and range of motion improvements. In unilateral case left hip was involved in 18 cases and 12 hips involved in right. Bilateral involvement is seen in 20 cases (40 hips). 40 hips belonged to stage 1 and 30 hips were classified in to stage 2(stage 2A- 20



Pre-op x ray



post op x ray



Follow up on 2 months



Follow up on 6 months

MRI SCAN BOTH HIP JOINT
(PLAIN)
(Duplicate Report)

MR imaging of the both hip joint performed and high resolution T1 and T2-weighted serial sections obtained in the sagittal and axial planes on a 1.5 Tesla scanner.

Abnormal high signal intensity geographic area noted involving right head of femur involving subchondral region which is involving less than 50% of weight bearing area on sagittal scan, the articular surface of right femoral head appears non-depressed.

Bone marrow edema involving right femoral neck and intertrochantric region.

Mild amount of free fluid involving right hip joint.

On postcontrast study there is abnormal enhancement of femoral head and synovium noted.

Head of left femur appears normal in contour with normal signal intensities on T1 and T2WI.

Articular surfaces of left hip joints look normal.

Joint space appears normal on the left side.

No evidence of changes of avascular necrosis seen in the head of the femur on the left side.

No evidence of synovial effusion seen in the hip joints on the left side.

Bone marrow appears normal in head, neck and upper shaft of femur on left side.

COMMENTS :-

- Finding are suggestive of Grade II AVN with changes of synovitis and reactionary free fluid involving right hip joint.

Pre op MRI scan
Follow up movement

MRI SCAN BOTH HIP JOINT
(PLAIN)

MR imaging of the both hip joint performed and high resolution T1 and T2-weighted serial sections obtained in the sagittal and axial planes on a 1.5 Tesla scanner
(POSTOPERATIVE CASE OF grade II AVN of RIGHT HIP)

There is subtle abnormal high signal intensity changes with articular surface irregularity noted involving head of right femur with minimal free fluid noted involving right hip joint on STIR.

There is linear irregular high signal intensity changes noted involving right head and neck of femur in STIR suggestive of post operative changes.

left hip joint appear normal.

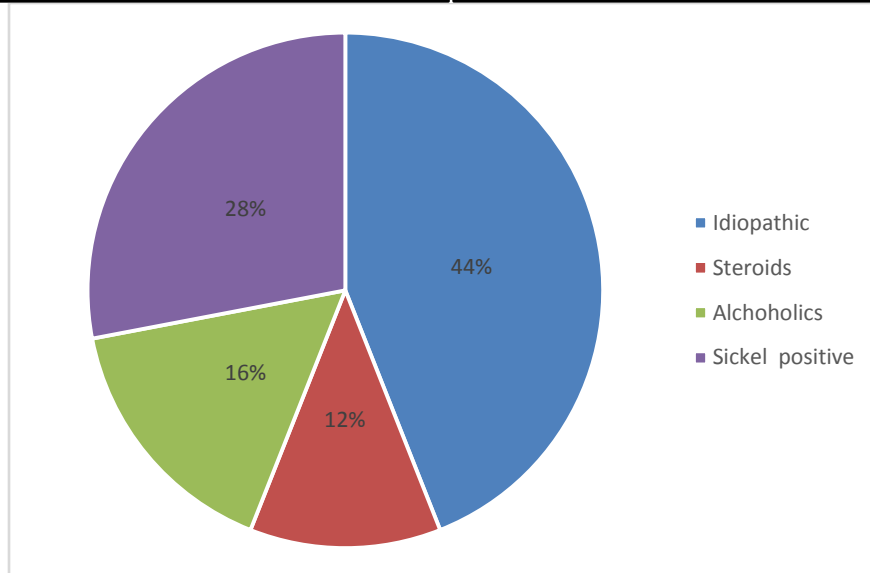
Both sacro-iliac joint appear normal.

Ovarian cyst noted in right ovary measuring 3x3cm possibly corpus luteal cyst.

COMMENTS :-

- As compared to previous scan dated 23/4/16 ,there is marked improvement of bone marrow changes with subtle abnormal high signal intensity changes involving right side of head of femur and minimal free fluid as described above .

on follow up 6 month MRI scan



and stage 2B -10). Radiological progression and increased pain was seen in 20 patients which eventually ended up in total hip replacement at the end of follow up period.

Discussion:-

This study was performed on 70 hips of 50 cases, 35 males and 15 females, 30 cases had unilateral AVN and rest 20 had bilateral AVN. Modified Ficat and Arlet classification was used. stage 1- 40 hips , stage -2A 20 hips and stage - 2B 10 hips. 22 patients having AVN had idiopathic cause, 6 patients had history of drug intake, 8 patients were alcoholics and 14 patients were sickle positive.

Treating ischemia of femoral head has become more common since many of the cases are detected in early stage. Early diagnosis before the appearance of radiological changes is very important of avascular necrosis. Diagnosis is based on clinical examination, bone scan, CT scan and MRI. X-ray is of very limited significance in early stage of the disease. MRI has dramatically improved the diagnosis of avascular necrosis, especially in the early stages when there are only bone marrow changes

Core decompression reduces the symptoms of pre collapse stage of ischemic necrosis because of reduction of pressure in compartment. There is no significant role of conservative management in osteoporosis of femoral head. The ideal treatment modality should be simple, reproducible and with low morbidity and mortality. The main advantages of non vascularized graft are significant reduction in pain, early mobilization, easy and technically less demanding procedure, less chance of donor side morbidity, less chance of iatrogenic subtrochanteric fractures and shorter operative time.

Conclusion:-

AVN primarily affects the young active adults which leads to increase morbidity and functional disability. Our aim of treatment is to delay the progression of the disease. Efficacy of core decompression with cancellous bone

grafting provide much pain and improve functional abilities. It is safe and effective and easy to perform procedure for modified figat and arlet stage1 and stage 2.

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