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A RARE CASE OF IDIOPATHIC COMPLETE FEMORAL HEAD RESORPTION IN AN ADULT PATIENT TREATED WITH CEMENTED TOTAL HIP ARTHROPLASTY

Orthopaedics

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ABSTRACT

This is a rare case report of idiopathic complete femoral head resorption in an adult patient treated with cemented total hip arthroplasty (THA). 62-year-old gentlemen presented with history of progressive left hip pain for six months idiopathic in onset, which aggravated over the preceding two months with inability to walk. Radiographic evaluation revealed complete femoral head resorption within five months. Comprehensive evaluation ruled out infectious, traumatic, or other identifiable causes. The patient underwent cemented Total Hip Arthroplasty (THA), resulting in significant pain relief and restoration of mobility. This case highlights the utility of cemented THA in managing idiopathic femoral head resorption in adults.

KEYWORDS

femoral head resorption, idiopathic, total hip arthroplasty, cemented hip replacement, osteoarthritis, adult orthopedics

INTRODUCTION

Hip osteoarthritis and avascular necrosis are well-recognized conditions, typically associated with various etiologies, including trauma, infection, and oncological processes. Idiopathic femoral head necrosis is a rare condition affecting adults, predominantly males between 30-50 years old. [1]

The femoral head's avascular necrosis (AVN) is a form of aseptic osteonecrosis that occurs when the proximal femur's blood supply is disrupted, leading to the death of osteocytes. Either ischemia arising on a non-traumatic or traumatic background can cause AVN. Several factors increase the likelihood of AVN. The exact pathogenesis of AVN is unclear. Alcohol misuse, hip dislocation, fractures, and corticosteroid treatment are the most frequent etiological causes. [2] The blood supply to the femoral head (FH) is derived primarily from the lateral femoral circumflex artery (LFCA) and the medial femoral circumflex artery (MFCA), which is a major contributor. [3]

Reports of idiopathic femoral head resorption are rare and are scarcely reported in the literature. In the United States nearly 10,000–20,000 new cases are diagnosed every year. [4,5] Studies on femoral head resorption are scarce in India. The percentage of primary THA conducted for AVN in the American database (5.97%) was much lower than the percentage of THA performed for AVN in the Indian database (51.8%), according to a comparative study between the USA and India. In India, avascular necrosis was a prevalent indication. [6] Among the pediatric population it affects one in 10,000 population. [7] With a 10% overall prevalence, sickle cell disease (SCD) is the most frequent cause of femoral head osteonecrosis (ONFH) in children. [8] Compared to children, adults and adolescents have a far higher risk of osteonecrosis. [9,10]

The clinical presentation typically involves progressive hip pain, reduced range of motion, and significant functional impairment. Advanced imaging techniques, such as radiography and magnetic resonance imaging (MRI), often reveal complete loss of the femoral head, yet a definitive cause remains elusive. In the absence of a clear etiology, management strategies focus on symptomatic relief and restoration of hip function. [11]

Total hip arthroplasty (THA) is widely recognized as the definitive treatment for advanced hip joint destruction, offering significant improvements in pain relief and mobility. While uncemented implants are increasingly preferred for younger, active patients, cemented THA remains a reliable option, particularly in cases of compromised bone stock or unusual pathologies like idiopathic femoral head resorption. [12,13]

Here, we present a rare case of idiopathic complete femoral head resorption in an adult successfully treated with cemented total hip arthroplasty. This case highlights the importance of thorough evaluation, careful surgical planning, and the utility of cemented prostheses in addressing complex hip joint abnormalities.

This report describes an unusual case of idiopathic femoral head resorption in a 62-year-old male. The condition presented diagnostic challenges and required a multidisciplinary approach to rule out known etiologies. Surgical intervention using cemented total hip arthroplasty was performed to address the patient's symptoms and restore hip function.

Case Presentation

Patient Details: A 62-year-old male presented with complaints of progressive left hip pain over six months. The pain had significantly worsened over the last two months, rendering the patient non-ambulatory. There was no history of trauma, fever, or systemic symptoms.

History Of Present Illness:

A 62-year-old male patient presented with complaints of progressive left hip pain that began insidiously and was initially manageable with over-the-counter analgesics. Over the past six weeks, the pain has intensified, becoming severe and leading to an inability to walk for the last month, resulting in marked functional impairment. The pain was non-radiating and progressively worsened.

Six months prior, the patient experienced similar pain in the left hip and sought medical consultation but did not return for follow-up. One month ago, the patient was ambulatory without support. There was no history of hip disorders, prior surgeries, systemic illnesses, or significant trauma.

On physical examination, the patient exhibited a limited range of motion at the left hip, with abduction and adduction restricted to 5°. The straight leg raise test (SLRT) was limited to 0–10°. Internal rotation was painful and restricted. No scars, sinuses, or swelling were observed around the left hip. Tenderness was noted over the left hip, but all distal pulsations were palpable. Toe movements were intact, and peripheral sensations were preserved. A congenital deformity of the foot and toes was noted.

A standardized tool for evaluating the degree of hip discomfort and functional limitations in people with hip disorders is the Harris Hip Score. It considers things like mobility, pain thresholds, and the requirement for assistive technology. The preoperative Harris Hip Score was recorded as 15.15, indicating severe functional disability. The patient also presented with bilateral varicose veins and medial joint line tenderness. The range of motion at the knees was painful, further contributing to mobility issues.

Based on the clinical presentation and findings, a provisional diagnosis of idiopathic complete femoral head resorption of the left hip with

secondary osteoarthritis or avascular necrosis was made. Further imaging and diagnostic evaluation were planned to confirm the diagnosis and guide management. X-ray of Hip and pelvis showed the following complete resorption of the left femoral head, with associated joint space narrowing. Fig. 1 (a)

Further investigation involved MRI of the left hip showed femoral head fragmentation with proximal femoral migration, calcific deposits in the joint cavity, capsular distension, effusion, synovial thickening, and complete chondral denudation of the acetabulum Fig. 1(b). Marrow edema, protrusion acetabuli, and atrophic changes in the left gluteal muscles were also noted, with the right hip joint appearing normal.

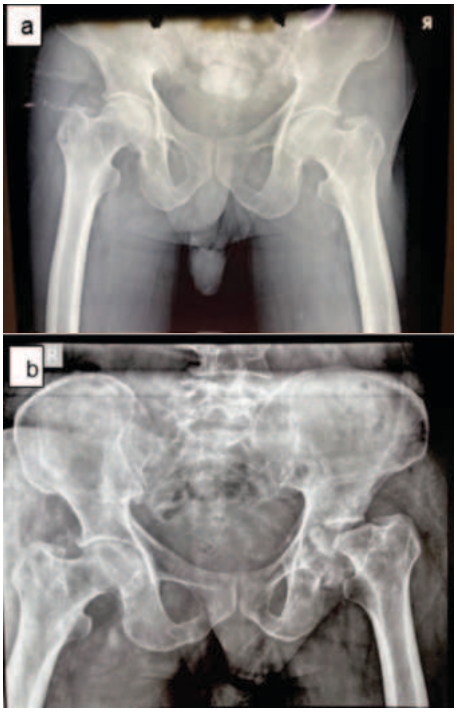

Fig 1. (a) (b) Patient's preoperative radiological data.

Fig. 1 (a) Figure 1(a), taken six months earlier when the patient first experienced hip pain, shows progressive resorption of the left femoral head with joint space narrowing. Although the femoral head is still partially visible, there is evidence of early osteolysis and subchondral changes, indicating an ongoing degenerative process leading to complete resorption seen in later imaging.

Fig 1 (b) The later preoperative X-ray in Figure 1(b) reveals complete femoral head resorption with superior migration of the femoral shaft. There is significant acetabular remodeling, joint space obliteration, and cortical irregularities, confirming advanced degenerative changes.

Fig 2 (a) & (b) shows the intraoperative Findings. During surgery, the hip capsule was found to be completely destroyed, with a flat and eroded femoral head. Histopathological analysis of the capsule and femoral head tissue revealed no evidence of infection, malignancy, or specific inflammatory conditions.

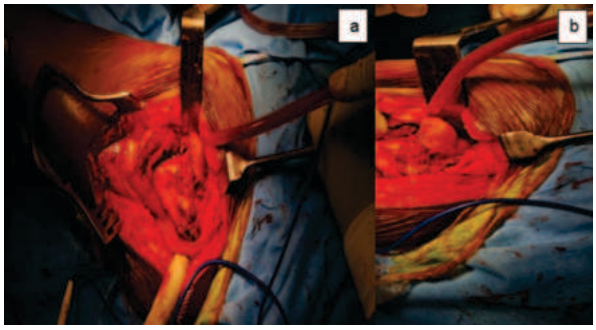

Fig. 2 (a) & (b) Intraoperative picture showing the completely destroyed femur head.

Figure 3. Post operative xray

The postoperative X-ray in Figure 3 shows a well-fixed cemented total hip arthroplasty with proper alignment of the femoral and acetabular components. There are no signs of loosening or periprosthetic fractures, indicating successful surgical reconstruction and stability.

The histological specimen showed fig 4. (a) & 4 (b) showed congested blood vessels and a necrotic trabecular pattern.

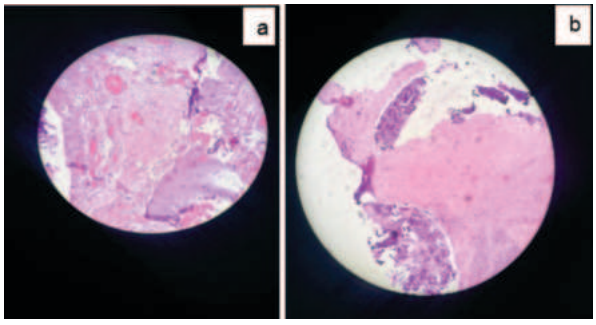

Fig 4 (a) & 4 (b) The histological specimen

Cemented total hip arthroplasty was performed. Given the patient's propensity to put off getting medical help, we gave him a specialized rehabilitation regimen and postoperative counselling. Further plans included physiotherapy and functional exercises. To strengthen muscles and encourage blood circulation, the patient was given instructions on both active and passive foot, ankle, knee, and hip motions after recovering from anesthesia. Following surgery and the initial follow-up check, the patient started to stand and walk gradually, with the amount of time spent standing and walking growing daily. Precautions were taken to avoid excessive flexion, adduction, and internal rotation of the surgical incision due to the posterior approach.

The post operative radiological findings during follow-up showed normal walking function, well-positioned hip joint prostheses, and no signs of loosening. The recent x-ray taken one month back showed the pelvic and femoral bone quality was good, with no lesions. The bone cortex showed good continuity, normal trabecular patterns, and no abnormalities. The Harris Hip Score (HHS), first published in the Journal of Bone and Joint Surgery in 1969, was intended to serve as a standardized evaluation tool for patients after total hip replacement. Range of motion, function, activity, and pain are the four categories in which it has 13 scores. After one month, the patient's post-operative Harris-Hip score (HHS) was 30, and three months later, it was 70. It has 13 scores in four categories: range of motion, function, activity, and pain.

This case demonstrates the usefulness of a comprehensive examination, interdisciplinary study, precise diagnosis, and total hip replacement for individuals who have lost their femoral heads. Following surgery, the patient's walking function quickly returned, which increased patient satisfaction. The patient gave verbally informed consent for the dissemination of pertinent information and study results.

DISCUSSION

Idiopathic femoral head resorption is a rare phenomenon in adults. The occurrence of bilateral femoral head AVN is 53.41% % in adults and unilateral AVN is 46.59 % as per an Indian study. [10] It becomes important to identify and rule out other benign causes of head

resorption in the background of establishes common causes of avascular necrosis such as trauma, steroids, alcohol, covid, hemoglobinopathies etc. Hence it is important to get a histopathological diagnosis. Pathophysiology may involve an imbalance in osteoblastic and osteoclastic activity, but definitive mechanisms remain speculative. [1]

In this case, rapid progression of symptoms and radiological findings necessitated prompt surgical intervention. Cemented THA was chosen for this patient due to the osteoporotic nature of the bone, ensuring stable fixation and early mobilization. Compared to uncemented techniques, cemented prostheses provide reliable outcomes in patients with compromised bone quality. Chen Yang et al., (2019) found that cemented THA exhibited better functional outcomes and lower early revision rates than uncemented THA in osteoporotic patients. [14]

This case underscores the importance of a thorough diagnostic workup to exclude secondary causes and highlights the role of cemented THA as a safe and effective treatment option in managing idiopathic femoral head resorption. Early surgical intervention can significantly improve pain and functional outcomes.

CONCLUSION

In patients with no known causes of avascular necrosis (AVN) especially in unilateral condition with complete head resorptions, it is important to involve pathologists and have thorough radiological and histological evaluations for such cases of adult unilateral avascular necrosis with accentuated complete femoral head resorption. In such patients cemented total hip arthroplasty (THA) is a good option with good functional outcomes.

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