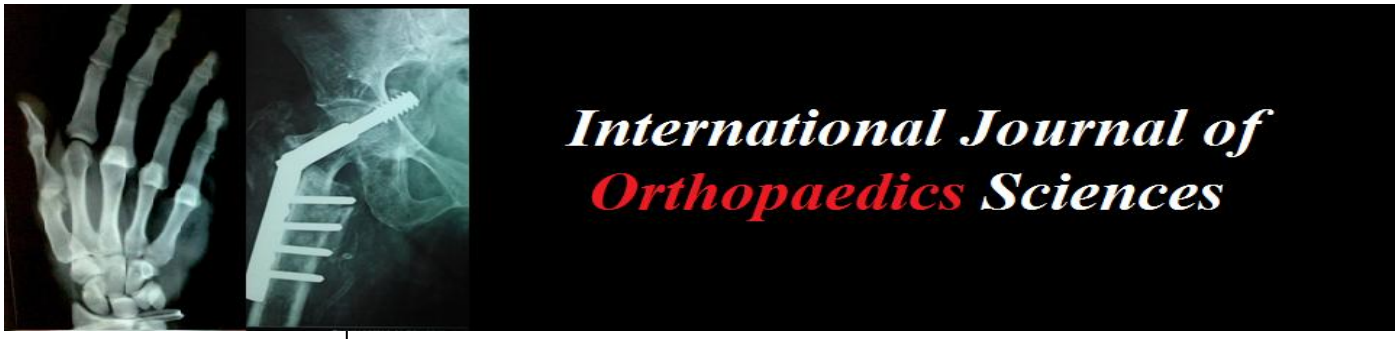

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Modular bipolar prosthesis and total hip replacement in a case of bilateral osteoarthritis of hip: Case report

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Abstract
Osteoarthritis of the hip is a common clinical problem and major causes of pain, disability and cost to the community through joint replacement surgery. Most studies examining structural changes in hip osteoarthritis have focussed on radiographic assessment but, a major limitation is that radiographs do not capture the early structural changes that may occur before joint symptoms are recognised. By the time early radiographic joint space narrowing of the hip is detected, 13% of femoral head cartilage volume has already been lost. Depending on the age, degree of bony deformation, acetabular involvement, hip dislocation and soft tissue alteration numerous treatment strategies are available. Pre-operative planning based on a thorough clinical and radiographic examination is essential. The aim of planning is to determine the appropriate surgical technique (including the necessary access), to assess the quality and quantity of existing bone substance and finally, to select the appropriate implant and its best possible positioning. We present a case of 26 year old female patient with bilateral osteoarthritis secondary to coxa vara for whom, over the course of two years, modular bipolar hemiarthroplasty was done on the right hip and total hip arthroplasty was done on the left hip.

Keywords: Total hip arthroplasty, modular, hip replacement, osteoarthritis, hemiarthroplasty

Introduction
Osteoarthritis of the hip is caused by degeneration of articular cartilage and the underlying bone and can be divided into two types: primary - associated with advancing age and secondary subsequent to-fractures, avascular necrosis, infection, developmental dysplasia, and femoro-acetabular impingement [1]. Radiography remains the first line imaging modality for diagnosing and monitoring Osteoarthritis, due to its accessibility, low cost, and ease of interpretation.

Developmental dysplasia of the hip encompasses a range of hip abnormalities where the femoral head and acetabulum fail to develop and articulate anatomically. Developmental dysplasia of the hip was previously thought to be a congenital condition, but is now known to be a dynamic developmental condition, which may deteriorate or improve over time. Adult presentation with developmental dysplasia of the hip depends on the extent of disease progression and the degenerative changes that might have set in. Untreated developmental dysplasia of the hip can lead to tears within the labrum which can be painful and restrictive. Coxa vara is a hip deformity caused by a decreased angle between the femoral neck and shaft to less than 120º as measured on an anteroposterior radiograph. It is classified into three groups: developmental coxa vara, coxa vara with congenital femoral deficiency and acquired coxa vara. Patients often present with gait abnormalities and limb-length discrepancy. In untreated cases, progressive deformities also occur in the femoral head and the acetabulum, leading to the loss of hip function with the development of premature degenerative changes.

Case Report
A 26 year old female came with complaints of bilateral hip pain, and limp since 1 year. Pain was insidious in onset, gradually progressive, more in the right hip, worse with walking and relieved with rest. On clinical examination right limb was shortened by 2.5 cm with fixed flexion deformity of 20 degrees. Hip movements were painful and restricted especially Internal rotation and Abduction.

A plain radiograph of pelvis with both hips in Ap view showed Bilateral Coxa Vara with significant arthritis of both hips. On lateral view of right hip acetabular changes were minimal. In-view of patients age both modular and total hips prosthesis were kept ready. Intraoperatively as the right hip acetabulum was well preserved, Modular hip prosthesis was used [Fig 1]. Patient presented with progressive left sided hip pain 1 year later. On clinical examination there was anterior joint line tenderness present over left hip and approximately 4 cm shortening of left lower limb was present. Hip movements were painful and grossly restricted. A plain radiograph of pelvis with both hips in AP view showed severe osteoarthritis of left hip with intact prothesis in right hip. Left total hip replacement was done and limb length discrepancy was reduced to 5 mm [Fig 2]

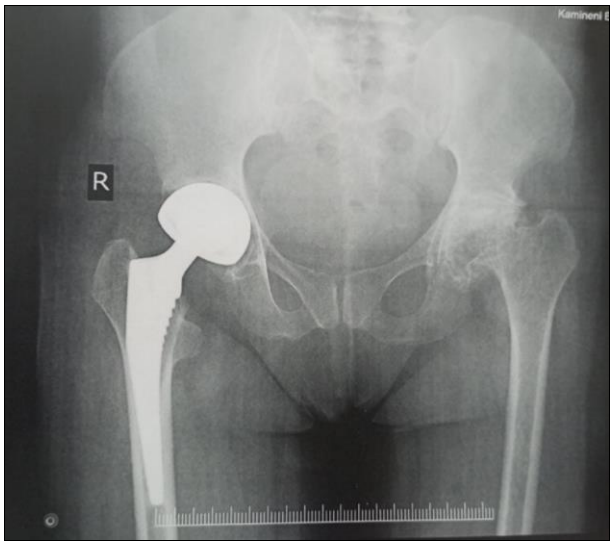

Fig 1: Modular Hip Prosthesis of right hip

Fig 2: Post-operative Radiograph

Discussion

Dysplastic hips share a common pathophysiology in which anatomic abnormalities result in increased contact stress leading to abnormal hip biomechanics, instability, impingement, associated labral pathologic conditions, and in the long term often osteoarthritis [5]. Therefore, many patients require hip arthroplasty.

Adult patients with developmental dysplasia of the hip develop secondary osteoarthritis and eventually end up with total hip arthroplasty at younger age. Because of altered anatomy of dysplastic hips, Total hip arthroplasty in these patients represents a technically demanding procedure.

Distorted anatomy of the acetabulum and proximal femur together with conjoined leg length discrepancy present major challenges during performing Total hip arthroplasty in these patients. In addition, most patients are at younger age, therefore, soft tissue balance is of great importance (especially the need to preserve the continuity of abductors) to maximise postoperative functional result.

The position of the acetabular component defines the center of hip rotation that influences hip biomechanics in terms of hip joint reaction force and abductor muscle force as well as leg length and femoral reconstruction [6].

The key point of surgical treatment is to ensure long-term stability of the endoprosthesis by restoration of anatomical and biomechanical relationships. This is technically demanding due to deficient acetabular bone stock, abnormal femoral anatomy with increased neck-shaft angle and valgus orientation, increased anteversion, muscle contracture and leg-length discrepancy [7, 8].

Modular Bipolar Hemiarthroplasty has the advantages of smaller dislocation rates, less complex surgery, shorter surgical time, and lower initial costs.

Conclusion

True acetabular involvement in a case of hip arthritis is difficult to evaluate with x-rays and MRI. Intraoperative acetabular status can be used for choice of implant, especially in case of younger patients. In a relatively well-preserved acetabulum in hip arthritis, especially in young patients, a modular hip prosthesis has the advantages of cost, duration and similar functional outcome to total hip arthroplasty. In conclusion, modular hip prosthesis can be judiciously used in young patients with hip arthritis provided acetabulum is relatively well preserved.

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Author's Contribution

Not available

Conflict of Interest

Not available

Financial Support

Not available

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