



Management of Synovial Chondromatosis in Arthritic Hip with Total Hip Arthroplasty

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Abstract

Background: Synovial chondromatosis often occurs in the knee, followed by the hip, elbow, and shoulder. Synovial chondromatosis is an uncommon, benign condition of the synovial tissue. Early treatment is necessary to help relieve painful symptoms. At a later stage, it can lead to joint arthritis.

Materials and Methods: Arthroplasty with simultaneous synovectomy was performed in patients with synovial chondromatosis with an arthritic hip. The posterior approach was taken in all the cases, and patients followed up at 1 month, 2 months, 6 months, and annually thereafter till now.

Results: Large wedged clumps of loose bodies demonstrated, histologically confirmed. At the latest follow-up, the entire patient remains symptom-free with no radiographic evidence of recurrence.

Conclusions: Arthroplasty with simultaneous synovectomy in the arthritic hip of synovial chondromatosis provides reliable pain relief and excellent disease-specific survival at long-term follow-up.

Keywords: Antibiotics; Microbial; Resistance

Introduction

Synovial chondromatosis of the hip is an uncommon condition with an unknown etiology [1-6]. The treatment is challenging & the natural history is unpredictable. It is a monoarticular disease that occurs due to metaplastic chondroid proliferation within articular structures. It affects mainly large joints. The lesions usually remain confined to a single hip, with ensuing damage to the articular cartilage leading to arthritis. Lesions occur in large joints, with the most frequent location in the knee and less frequently in

the hip, elbows, wrists, ankles, and temporomandibular joints [7]. Synovial chondromatosis usually occurs in adults, and more often in men [8]. Clinical symptoms include intermittent pain, restriction of movements, and swelling. Stiffness or locked joints may occur at a later stage. Symptoms are usually insidious in onset, however the patient may be asymptomatic. Mechanical damage to the cartilage joints occurs due to multiple intraarticular loose bodies and can lead to joint effusion, osseous erosion, secondary degenerative osteoarthritis, and the final complications can be in the form of subluxation or pathological fractures [7].

In younger patients and children and hip joints without arthritis, debridement for evacuation of loose bodies with synovectomy is usually done by arthroscopic or open method. Arthroscopic procedures have a higher recurrence rate ranging from 7.1% to 39 % [9-11]. Open procedures are also used for debridement and synovectomy with or without hip joint dislocation [12-16]. If the femoral head is dislocated, synovectomy and loose body removal become easy but there is a risk of avascular necrosis of the hip, osteoarthritis, etc. Surgical dislocation of the hip (Ganz et al. technique) can be performed to achieve dislocation of the femoral head without the risk of AVN [17]. Total hip arthroplasty is performed in patients with pre-existing joint arthritis / pathological fractures. Staging of Synovial chondromatosis (SC) depending on pathology found:

Stage 1: Active intrasynovial disease with no nodule formation,

Stage 2: Development of nodules in the synovial membrane,

Stage 3: Formation of multiple loose bodies in the joint but synovium is quiescent [18].

Staging of the disease plays an important role in the assessment of the disease and the decision-making.

Radiology

Magnetic resonance imaging arthrogram shows innumerable small intermediate-intensity filling defects situated diffusely within the joint fluid. MRI is a good diagnostic method for this disease [19]. Radiographic examination reveals irregularly shaped loose bodies within a synovial joint. The number of intraarticular lesions is greater for the primary type than secondary. This number may vary anywhere from 2 to 3 or loose bodies to several dozens. They are present in variable sizes and shapes. Several loose bodies may combine to form larger bodies. The gross and microscopic evaluation of the loose bodies reveals lobulated masses of hyaline cartilage surrounded by a layer of synovial tissue. The hyaline cartilage is hypercellular, and the cells are often atypical. These atypical changes are multinucleated cells, myxoid degeneration of matrix, crowding of cell nuclei, and large nuclei.

Material and Methods

This study was performed in the Department of Orthopaedics, SRG Hospital, and medical college Jhalawar, Rajasthan, (India) from April 2019 to March 2024 including 14 patients (9 male and 5 females) with synovial chondromatosis of the hip, out of them joint destruction/ arthritis established in 8 patients. Total hip arthroplasty was performed in 6 cases where the joint became arthritic. Out of them, 4 were male and rest female. The mean age was 42 years. Diagnosis was made based on clinical history, physical examination, and imaging and further confirmed by biopsy.

The Inclusion Criteria are

- Adult patients (>18 years) with the mental ability to give informed consent for treatment.
- Patient in which joint destruction occurred.
- Patient fit for anaesthesia.
- Where the other option to save the joint is not possible.
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- The Exclusion Criteria are
- Presence of neurovascular compromise.
- Patient not willing for surgery.
- Patient who is not fit for surgery due to medical condition.
- Children's and very young age group.

Surgical Technique

Moore's posterior approach to the pelvic incision was carried out for most cases because the external rotation was more restricted in mostly patients. The location of the surgical incision for a posterior approach to the hip was marked. 15cm long longitudinal curvilinear incision made at the hip for the posterior approach of the hip. The fibers of the gluteus maximus were divided proximally. The gluteus medius and gluteus minimus muscles were retracted anteriorly. The sciatic nerve was palpated posteriorly in the soft tissues. The piriformis muscle was identified. The capsule was opened proximally in an oblique manner. The piriformis and the short external rotators were released off the femur in a single soft-tissue sleeve. Degeneration of the femoral head with an appearance of arthritis and osteophyte formation along with visible intra and extracapsular loose bodies were observed and excised. Synovectomy was performed on the hyperplastic lining of the synovium and the preparations were sent to the histopathology laboratory. A femoral Neck cut was done, femoral and acetabular preparation was done, and a total hip replacement was done. After reduction capsule closure was done with the modified Ranawat technique.

Observational Results

Clinical and radiological improvements were recorded in all cases. There was an improved range of motion with symptom relief. On physical examination, pain on flexion and rotation improved in all patients. Return to normal activities was allowed eight weeks post-surgery. Preoperative diagnosis of synovial chondromatosis was confirmed intra-operatively and by histo-morphological examination in all cases. No complications or recurrences have been observed at the moment of till date. Mean Harris Hip Score improved significantly from 52 (range 25-82) preoperatively to 85 (range 45-98) postoperatively. At the latest follow-up, all the patient remains symptom-free with no radiographic evidence of recurrence. No cases of thromboembolism, infection, or other major complications were recorded.

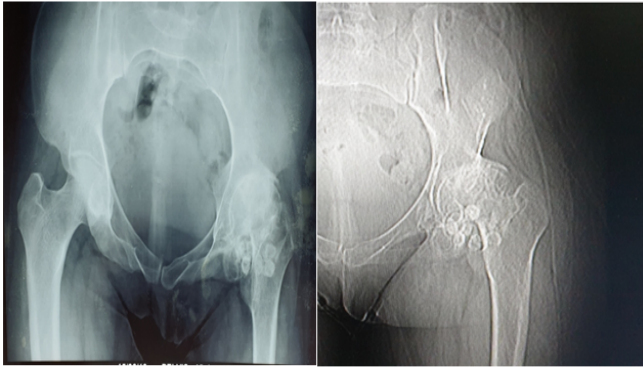


Figure 1: Preoperative radiographs of synovial chondromatosis.

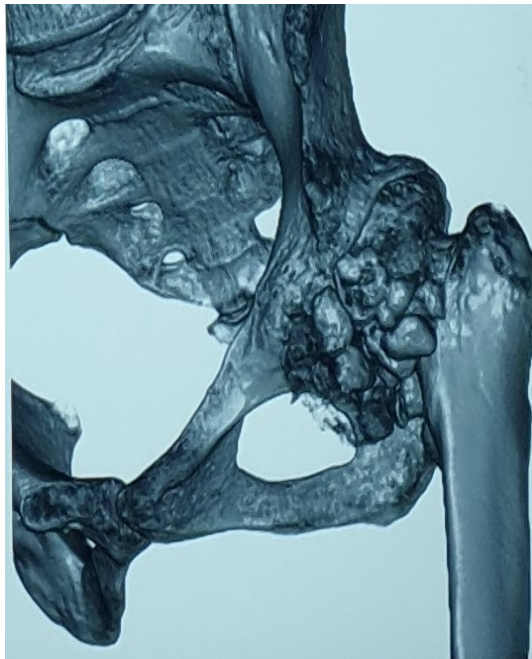


Figure 2: 3d Reconstruction CT Imaging.

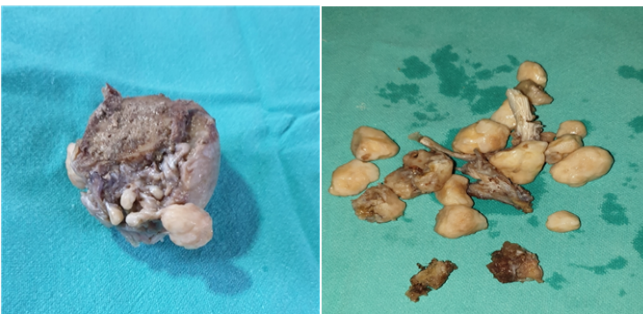


Figure 3: Intra-operative findings.



Figure 4: Radiological outcome- Post-op radiograph, Radiograph at 1 year follow ups.



Figure 5: Functional outcome- Squatting and cross leg position possible in operated patients.

Discussion

The term synovial osteochondromatosis has been used to describe a specific pathological process presenting in otherwise normal joints. Synovial osteochondromatosis is the term used to describe the conversion of synovial connective tissue to cartilage. In our patients with synovial chondromatosis of the hip, no radiographic findings were normal. In the present study, joint space narrowing, juxta-articular ossified bodies, bone erosion, juxta-articular osteopenia, and osteophytes were noted. Our results showed that CT & MR imaging are useful in the diagnosis of synovial chondromatosis of the hip. MR is especially useful in cases in which juxta-articular calcified and/ or ossified bodies are not present. To reduce the risk of secondary osteoarthritis of the joint the synovial chondromatosis should be excised if diagnosis is set before signs of osteoarthritis are present. The type of approach used for resection is based on patient characteristics, extent and localization of the lesion, restriction of movements, and surgeons' preferences.

Conclusion

Open debridement for evacuation of loose bodies and synovectomy followed by THR provides good results regarding functional outcomes without any recurrence. Patient age and grade of osteoarthritis could be a distinguishing factor for choosing a treatment option. In younger patients and children, debridement for evacuation of loose bodies with synovectomy is the recommended option while THR is a good surgical option in older patients with radiological signs of hip joint osteoarthritis.

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