



Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Management of synovial chondromatosis of the hip by open arthrotomy debridement only VS total hip replacement: A case report

Yogi Prabowo^a, Ifran Saleh^a, Astuti Pitarini^b, Muhammad Ade Junaidi^{a,*}

^a Department of Orthopaedics and Traumatology, Cipto Mangunkusumo General Hospital – Faculty of Medicine Universitas Indonesia, Jakarta, 10430, Indonesia

^b Orthopaedics and Traumatology, St Carolus Hospital, Jakarta, 10440, Indonesia

ARTICLE INFO

Article history:

Received 19 March 2020
Received in revised form 29 June 2020
Accepted 3 July 2020
Available online 16 July 2020

Keywords:

Synovial chondromatosis
Loose bodies
Osteoarthritis
Total hip replacement
Open arthrotomy debridement
Case report

ABSTRACT

INTRODUCTION: Synovial chondromatosis is an unusual nonneoplastic condition of joints. Clinical symptoms usually insidious, and the patient often came in the late stage of the disease. Treatment generally include arthroscopy debridement, open arthrotomy debridement to evacuate loose bodies, synovectomy then followed by a total hip replacement. The latter underwent open arthrotomy debridement only to evacuate loose bodies and synovectomy without performing dislocation of the hip. Postoperative outcome was evaluated using plain hip x-ray, pain scale with VAS, and functional score with Harris Hip Score (HHS).

METHODS: We report two cases of a 55-year old and a 22-year-old man with synovial chondromatosis of the hip. The former underwent open arthrotomy debridement to evacuate loose bodies, synovectomy then followed by a total hip replacement. The latter underwent open arthrotomy debridement only to evacuate loose bodies and synovectomy without performing dislocation of the hip. Postoperative outcome was evaluated using plain hip x-ray, pain scale with VAS, and functional score with Harris Hip Score (HHS).

RESULTS: At 1-year follow up, both subjects demonstrate an improving functional outcome. The former patient had an improved HHS from 39 to 91 while the latter had an improved HHS from 68 to 93. With complete removal of the metaplastic tissue and synovectomy, the recurrence of the chondromatosis is not apparent yet until now.

DISCUSSION: Arthrotomy debridement only or arthrotomy debridement followed by total hip replacement can be considered as an option in treating synovial chondromatosis of the hip as both show a successful outcome. A selective method of treatment must be considered in our decision making for each individual.

© 2020 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Synovial chondromatosis is a non-neoplastic condition where metaplastic cartilage nodules in the synovium of the joints, bursa, or tendon sheath are present. Lesions are almost always monoarticular and tend to occur in large joints, with the most frequent location in the knee and less frequently in the pelvis, elbows, wrists, ankles, and temporomandibular joints [1–4]. Synovial chondromatosis is uncommon, usually occurs in adulthood, and more often in men.

Symptoms include intermittent pain, swelling, and in the final stages of stiffness or locked joints occur. Sometimes lesions can arise as a soft tissue mass without pain in the area around the joint [2]. A firm and uniform mass, along with joint effusion, can also be seen. If there is calcification or ossification of the nodule, a chondroid picture can be observed. On MRI, ossified or cartilaginous nodules can be seen in the joint [1,2].

On MRI, ossified or cartilaginous nodules can be seen in the joint [1,2].

Synovial chondromatosis is a self-limiting disease, but tends to recur locally, especially in cases where excision or synovectomy is not carried out thoroughly [5]. Damage to the joint surface can cause secondary degenerative diseases.

Transformation towards malignancy has been documented. According to Dahlin, there were three cases of chondrosarcoma secondary to synovial chondromatosis. The diagnosis is difficult to establish because of the atypical cytological picture of synovial chondromatosis that already exists. Features that can be found include 1. changes in myxoid on the chondroid matrix with the cystic formation and changes in mucoïd content and quality; 2. loss of typical features of chondrocyte cluster; 3. the existence of crowding and spindling of the cell nucleus at the peripheral edge of the cell lobes. Chondrosarcomas are even rarer in the synovium. However, the occurrence may be secondary to pre-existing synovial chondrosarcoma [1,2].

Mechanical damage to the cartilage joints due to multiple intraarticular loose bodies can cause secondary degenerative osteoarthritis, and the final complications can be in the form of

* Corresponding author at: Department of Orthopaedic and Traumatology, Faculty of Medicine, Universitas Indonesia, Dr. Cipto Mangunkusumo Hospital, Jl. Diponegoro no. 71, Jakarta, 10430, Indonesia.

E-mail address: ajunorthopaedi@gmail.com (M.A. Junaidi).

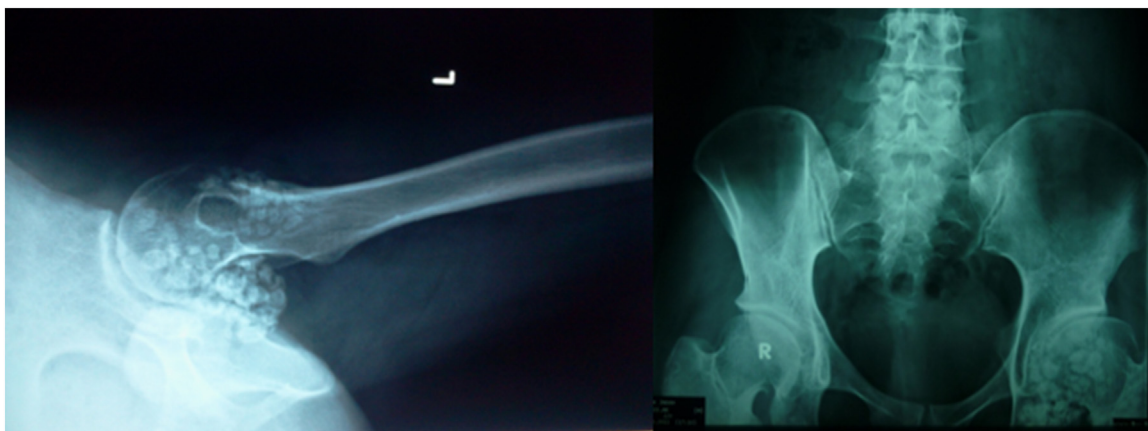


Fig. 1. Plain AP x-ray of the pelvis and femur showed a chondroid lesion, suggesting intra- and extraarticular loose bodies.



Fig. 2. Multiple white ovoid lesions were observed intraoperatively, approximately 0.5 cm in diameter. Debridement was carried out without hip dislocation.

subluxation or pathological fractures. Surgery is the optimal therapeutic option for the evacuation of loose bodies. Options can be either arthroscopic debridement or open debridement with or without joint dislocation. In joint damage with severe osteoarthritis, the choice of therapy can be in the form of joint replacement.

The arthroscopic technique in the management of synovial chondromatosis of the hip joint can be in the form of an evacuation of loose bodies or followed by a synovectomy [3]. In cases where there are only a few loose bodies, arthroscopy can be performed only for evacuation. According to a study by Chen et al., in cases where partial or total synovectomy is performed, recurrence is less frequent. Synovectomy can be performed using a shaver blade and thermocoagulation arthroscopic set and after that followed by an irrigation procedure. Complications include neurovascular injury during the installation of the arthroscopic portal or during intraoperative traction, iatrogenic injury to the cartilage and labrum when inserting the instrument [3].

With advances in technology in the field of surgery, arthroscopic surgery can be a promising procedure. Nevertheless, for some surgeons, arthroscopic hip joints can be a technically demanding procedure because of their deep-seated location, the hip joint is relatively narrow, and the indications for performing arthroscopic actions are not many, so the opportunity to perform this procedure becomes even rarer. However, this action has an advantage because debridement can be done for many cases of loose bodies so that cleaning can be optimized. In open debridement, partial or total synovectomy is also usually performed to prevent a recurrence. Besides, the choice of open debridement can be made with or without dislocation. Lim et al. conducted a retrospective study of twenty-one synovial chondromatosis patients of the hip joint who underwent debridement with dislocation (in the case of extensively) and arthrotomy alone without dislocation. From these studies, the results obtained that postoperative clinical scores, patient satisfaction, and radiological scores of osteoarthritis in postoperative patients did not differ significantly between

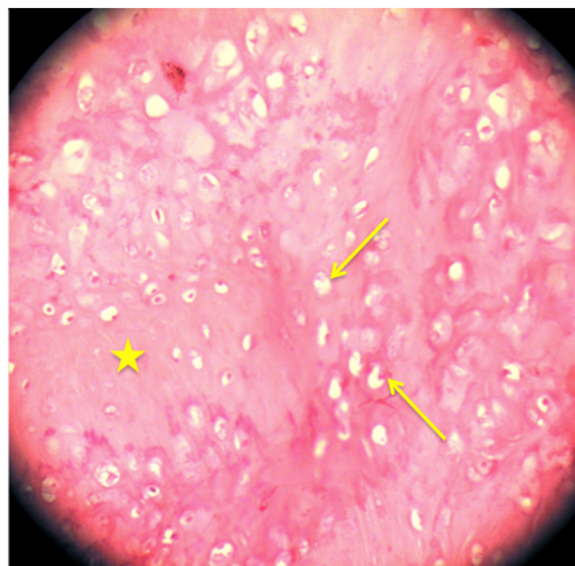


Fig. 3. Photomicrograph of the histopathological specimen showed chondrocytes (yellow arrow), distributed unevenly, and grouped between the base matrix (yellow star). (HE, 40x).

the groups that were dislocated with the arthrotomy group alone. In the dislocation group of patients, no recurrence was found while in the dislocated group recurrence was found in eight of thirteen, so it was concluded from this study that anterior dislocation showed more extensive cleansing. However, in the group with dislocation, complications were found to be higher, namely, with the discovery of one of eight patients who had avascular necrosis of the hip.

This case series was arranged to compare the outcomes of debridement and arthrotomy with the addition of THR as a procedure in synovial chondromatosis of the hip joint. Written consent

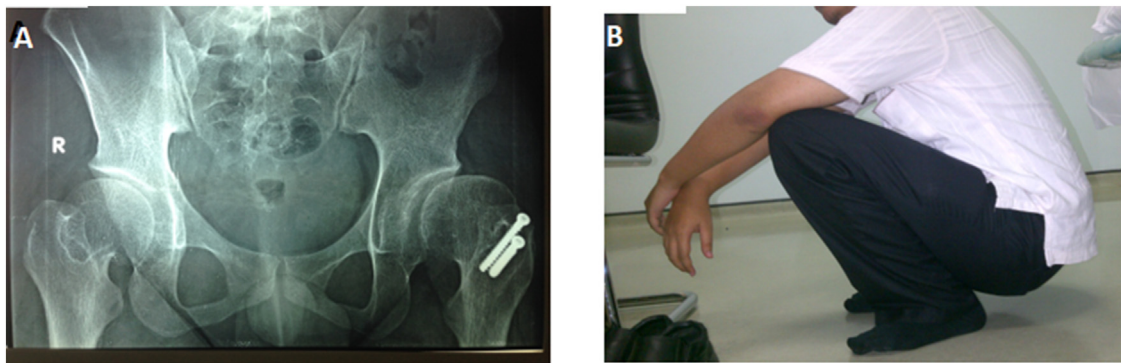


Fig. 4. (A) 20 months postoperative hip x-ray: the dysplastic femoral head was fixed with two screws appeared intact with no recurrence; (B) The patient was able to squat without pain.

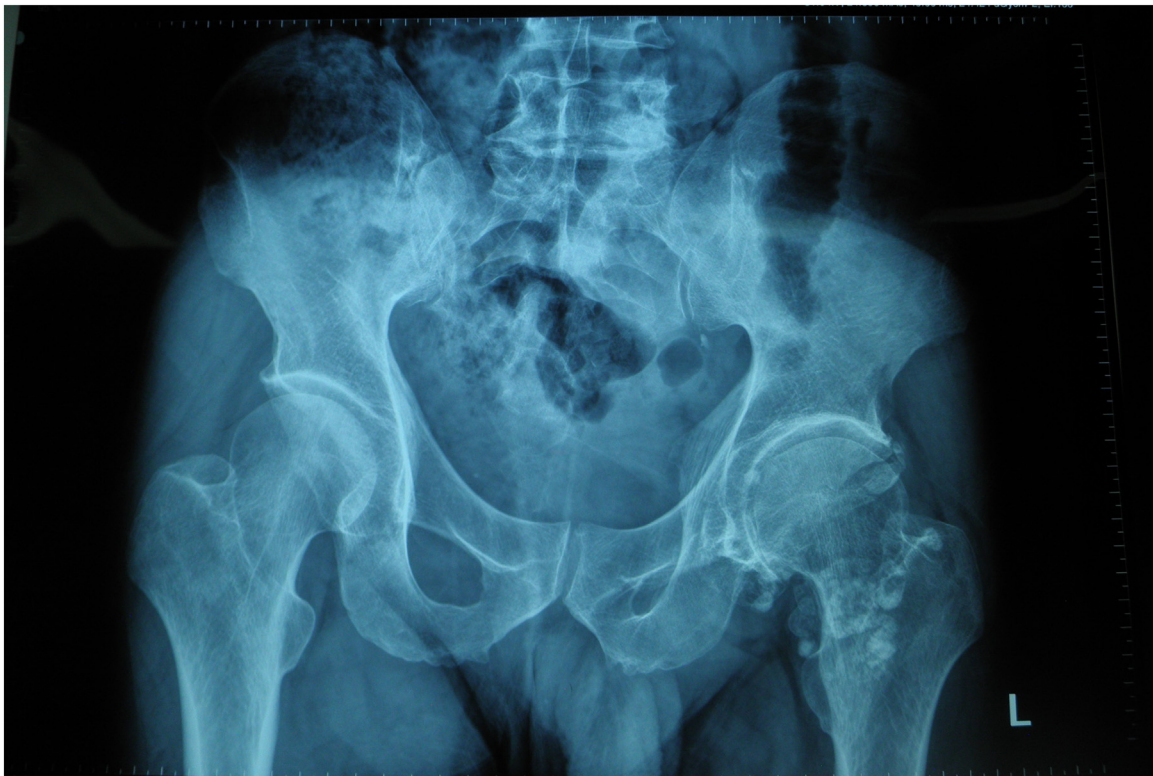


Fig. 5. Plain AP x-ray of the pelvis showed osteoarthritis of the hip with subchondral sclerosis, cyst formation, joint space narrowing, and intracapsular chondroid ossification.

has been received from the subject. The authors declare no conflicts of interest. This work has been reported in line with the SCARE criteria [6].

2. Case presentation

We report two cases of adult men with synovial chondromatosis of the hip joint. The first patient, a 22-year-old man, came to the outpatient clinic with complaints of pelvic pain from the previous four years (VAS 5–6), limitations of the hip movements, and limping. On physical examination we obtained 0–90° of flexion-extension hip ROM, external rotation 0–30°, internal rotation 0–20°, abduction 0–30°, adduction 0–20°. The impression was that there were limitations in hip motion.

From the results of a plain pelvic radiograph (Fig. 1), multiple intraarticular and extraarticular loose bodies and nodular images were pathognomonic. The patient underwent an MRI examination for the assessment of the soft tissue.

Intraoperatively (Fig. 2), open debridement was performed without dislocating the hip joint. Intraarticular evaluation of loose bodies was performed, with subsequent osteotomy in trochanteric major and synovectomy without dislocation of the hip joint. Furthermore, after debridement, the trochanter major was fixed with two screws. Synovial preparations were sent to the histopathology laboratory (Fig. 3).

After a postoperative evaluation of 20 months, a significant response to pain was evaluated on a VAS scale, from 5 to 6 to 0–1 postoperatively. Functional outcomes were assessed with the Harris Hip Score (HHS) and Lower Extremity Functional Score (LEFS) with a preoperative HHS score of 68, first month postoperatively to 93, and 20 months postoperatively to 97; while the preoperative LEFS values were 53 and 20 months postoperatively to 96. Also, an evaluation of the hip joint was performed with a plain pelvic radiograph. An abnormal femoral head with a picture of the same dysplastic shape before surgery was obtained. Signs of recurrence and avascular necrosis were not found (Figs. 4A, 3B).

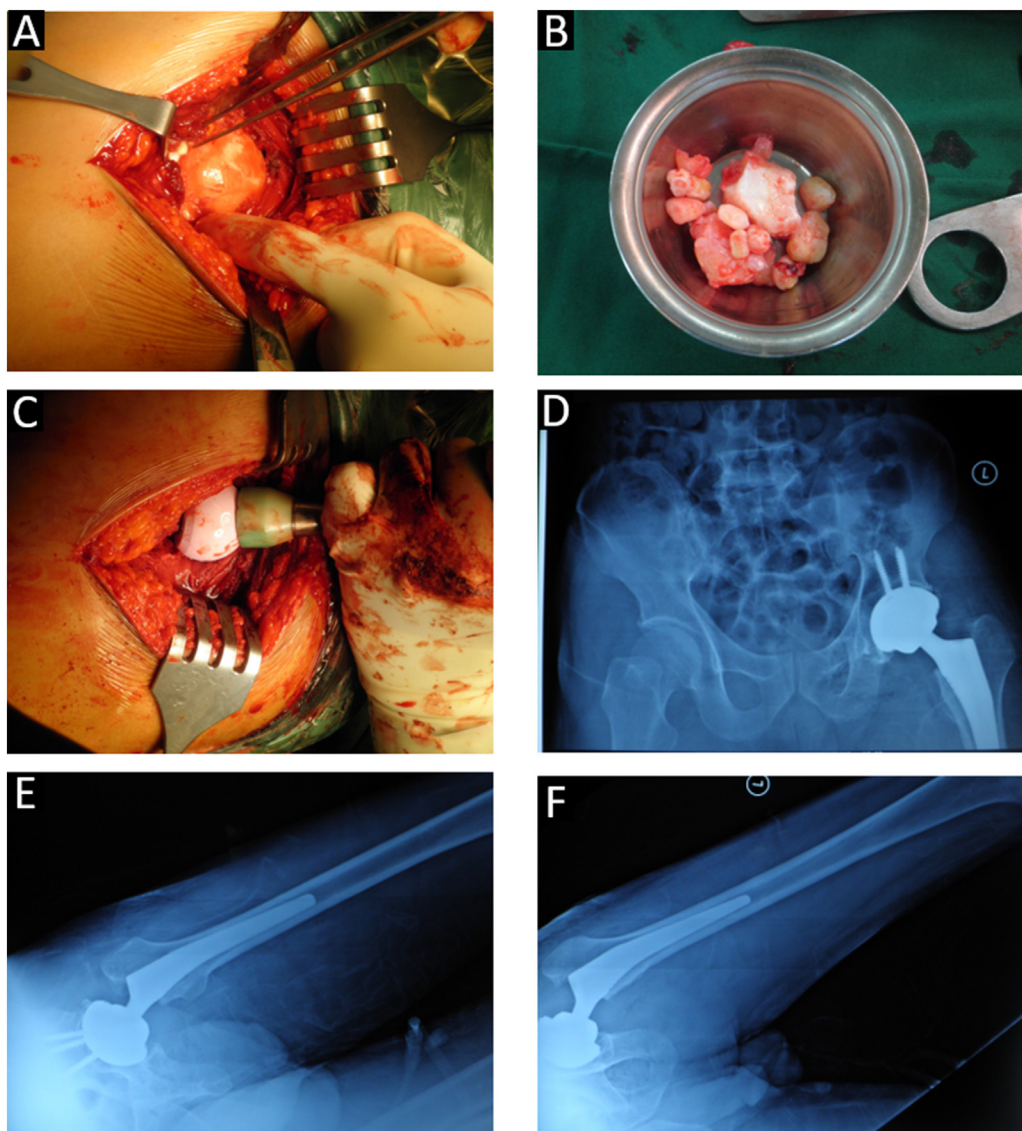


Fig. 6. (A) Femoral head after hip dislocation, osteoarthritis of the joint was observed with pale surface, and osteophyte formation, intra- and extracapsular loose bodies were observed; (B) Evacuation of 15 loose bodies was performed; (C) Installation of ceramic-on-ceramic prosthesis was performed; (D–F) Postoperative x-ray.

The second patient was a 55-year-old man with osteoarthritis of the hip joint due to synovial chondromatosis. The patient came to an outpatient orthopedic clinic with complaints of VAS 6–7 pain, limited hip joint motion, limping, and walking assisted with one stick. The patient was diagnosed with grade IV Kellgren–Lawrence osteoarthritis and planned for total hip arthroplasty surgery.

On physical examination, limitations in the left hip joint with flexion–extension ROM 0–80°, internal rotation 0–20°, external rotation 0–30°, abduction 0–20°, adduction 0–20° was obtained. The impression was that there were ROM limitations due to pain. On plain AP projections pelvic radiograph (Fig. 5), a picture of osteoarthritis joints with subchondral sclerosis, cyst formation, narrowed joint gaps, and an intracapsular chondroid ossification was observed.

Intraoperatively (Fig. 6), Moore’s posterior approach to the pelvic incision was carried out. Degeneration of the femoral head with an appearance of arthritis and osteophyte formation along with visible intra and extracapsular loose bodies were observed. As many as 15 loose bodies with the smallest size of 0.5 cm and the largest of 2 cm were evacuated. Synovectomy was performed on the hyperplastic lining of the synovium and the preparations

were sent to the histopathology laboratory (Fig. 7), then the femoral stem and ceramic femoral head were placed. On the acetabulum, an acetabular cup made of ceramic is installed.

Postoperatively, the patient was treated five days after mobilization with axillary crutches weight-bearing. Postoperatively, limb function was assessed by the HHS and LEFS questionnaires with values 39 and 21. Follow-up (Fig. 8) was carried out for one year in the orthopedic outpatient clinic. After one year, the operating outcomes were reassessed with the same scoring system and an improvement in the HHS score was 91 and LEFS was 74.

3. Discussion

In this case report, we present two cases of debridement only and debridement with a joint replacement then we evaluate the functional outcomes postoperatively until the 20th month. The second patient had secondary osteoarthritis Kellgren Lawrence grade IV, so the total hip replacement procedure was performed. The use of ceramic-on-ceramic components for arthroplasty is expected to be strong material. After 18 months, the recurrence and function were not satisfactorily assessed on the VAS pain

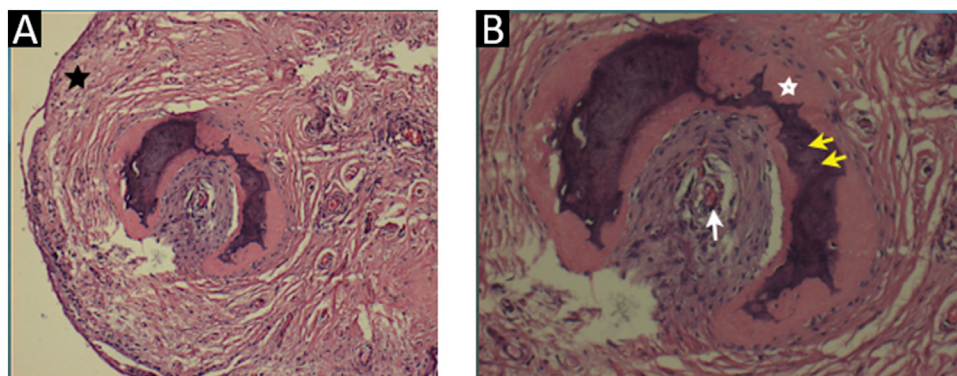


Fig. 7. Histopathological photomicrograph showed thin synovium (black star), chondrocyte that was distributed unevenly (yellow arrow) between the matrix substance (white star), also with an irregular focus area and calcification (white star). (HE, 20x); (B) (HE, 40x).



Fig. 8. The patient was able to squat without pain 18 months after the operation.

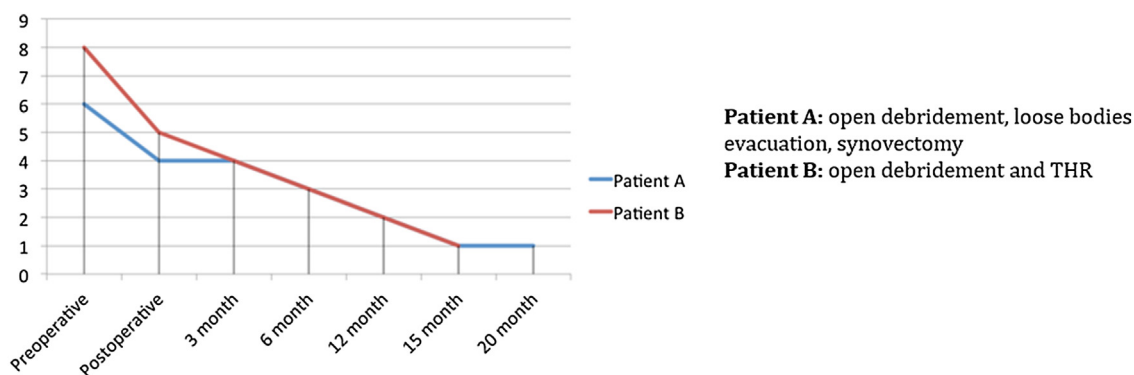


Fig. 9. Pain evaluation using the visual analog scale.

scale, functional outcome with HHS and LEFS. (Figs. 9, 10 and 11) [7–9].

Postoperatively the clinical and functional outcome of the two patients did not differ much according to what was reported from the study of Lim et al. in the first patient, after 20 months of post-operative evaluation, found no signs of recurrence and avascular necrosis from the results of x-ray control [10,11]. The same study

stated that the risk of recurrence occurs higher in patients without dislocations because debridement cannot be extensive. However, indeed, in this case, it takes even longer to determine that there was no recurrence. Follow up was carried on until 4th year in the study conducted by Lim, whereas these patients only reached the 20th month in our report [7]. Also, this study states that anterior dislocation will increase the risk of avascular necrosis even though

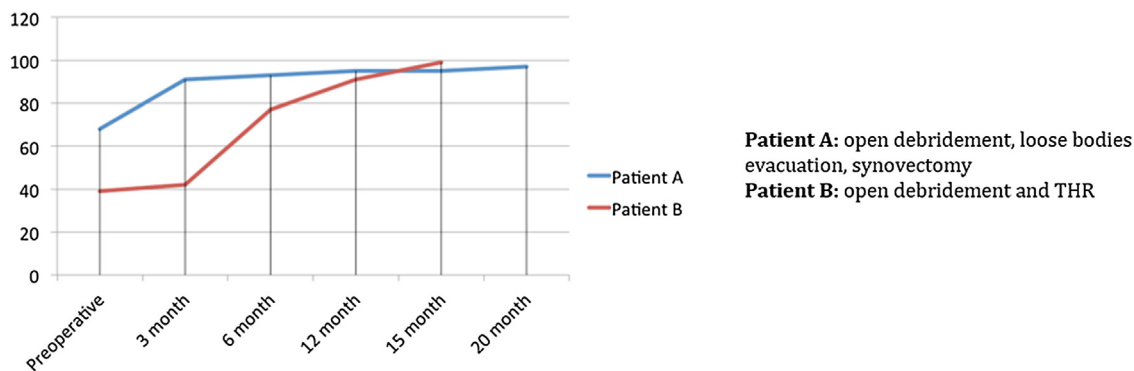


Fig. 10. Functional evaluation using the Harris Hip Score.

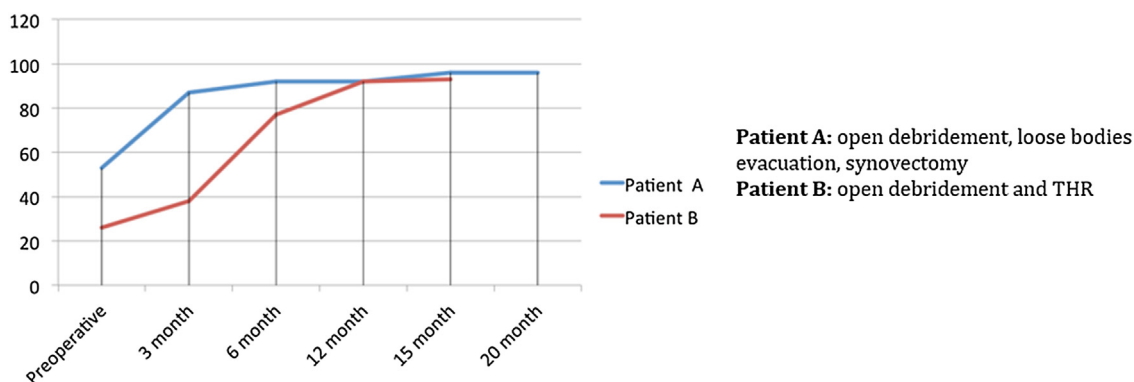


Fig. 11. Functional evaluation using the Lower Extremity Functional Scoring.

the debridement can be more extensive in cases where the loose bodies are extensive. In this case, loose bodies were found to be quite extensive, but we did not dislocate [3,12].

According to Chen et al., arthroscopic debridement can be done by all surgeons quite effortlessly with a low complication rate because it is performed without joint dislocation. Total synovectomy can also be done adequately without a doubt of recurrence. However, the limitation is the experience and opportunity to carry out this arthroscopic action. Because the indications are usually applied in cases with loose bodies that are not too extensive. In this case, it appears that debridement per arthroscopic is inappropriate because loose bodies are quite abundant [4,12].

4. Conclusions

Both surgery in the form of open debridement for evacuation of loose bodies and synovectomy and those followed by THR gave good results regarding functional outcomes without any recurrence. Grade of osteoarthritis and patient age could be a distinguishing factor for choosing a treatment option. THR could be a surgical option in older patients with radiological signs of hip joint osteoarthritis while in younger patients, debridement for evacuation of loose bodies with synovectomy is the recommended option.

Declaration of Competing Interest

The authors declare no conflicts of interest.

Funding

The authors report no external source of funding during the writing of this article.

Ethical approval

Ethical approval was not required in the treatment of the patient in this report.

Consent

Written consent has been received from the subject.

Author contribution

Yogi Prabowo contributes in the study concept or design, data collection, analysis and interpretation, oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.

Ifran Saleh contributes in the study concept or design, data collection, analysis and interpretation, oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.

Astuti Pitarini contributes in the study concept or design, data collection, analysis and interpretation.

Ade Junaedi contributes to the study concept or design, data collection and writing the paper.

Registration of research studies

N/A.

Guarantor

Yogi Prabowo is the sole guarantor of this submitted article.

Provenance and peer review

Not commissioned, externally peer-reviewed.

References

- [1] K. Unni, C. Inwards, Dahlin's Bone Tumours, 6th ed., Lippincott & Williams, USA, 2020, pp. 36–39.
- [2] C.D.M. Fletcher, K. Unni, F. Mertens, World Health Organization Classification of Tumours. Pathology and Genetics of Tumours of Soft Tissue and Bone, IARC Press, Lyon, 2002, 246.
- [3] S. Lim, et al., Operative treatment of primary synovial osteochondromatosis of the hip, *J. Bone Joint Surg. Br.* 88-A (2006) 2456–2464.
- [4] C.Y. Chen, et al., Synovial chondromatosis of the hip: management with arthroscopy-assisted synovectomy and removal of loose bodies: report of two cases, *Chang Gung Med. J.* 26 (March (3)) (2003) 208–214.
- [5] F. Frihagen, M. Grotle, J.E. Madsen, T.B. Wyller, P. Mowinckel, L. Nordsetten, Outcome after femoral neck fractures: a comparison of Harris Hip Score, Eq-5d and Barthel Index, *Injury* 39 (October (10)) (2008) 1147–1156.
- [6] R.A. Agha, M.R. Borrelli, R. Farwana, K. Koshy, A. Fowler, D.P. Orgill, For the SCARE Group, The SCARE 2018 statement: updating consensus Surgical CAse REport (SCARE) guidelines, *Int. J. Surg.* 60 (2018) 132–136.
- [7] S.J. Lim, H.W. Chung, et al., Operative treatment of primary synovial osteochondromatosis of the hip, *J. Bone Joint Surg.* 88-A (November (11)) (2006) 2456–2464.
- [8] J. Gille, et al., Synovial chondromatosis of the hip: a case report and clinicopathologic study, *Acta Orthop. Belg.* 70 (2004) 182–188.
- [9] J.M. Binkley, P.W. Stratford, S.A. Lott, D.L. Riddle, The Lower Extremity Functional Scale (LEFS): scale development, measurement properties, and clinical application. North American Orthopaedic Rehabilitation Research Network, *Phys. Ther.* 79 (April (4)) (1999) 371–383.
- [10] A.R. Jenabzadeh, S. Pearce, W.L. Walter, Total hip replacement: ceramic-on-ceramic, *Semin. Arthroplasty* 23 (December (4)) (2012) 232–240.
- [11] S. Hoppenfeld, P. deBoer, R. Buckley, Surgical Exposures in Orthopaedics: The Anatomic Approach, 4th ed., Lippincott, Philadelphia, 2009, pp. 404–463.
- [12] K. Fukui, A. Kaneuji, S. Amaya, T. Matsumoto, Synovial osteochondromatosis of the hip with femoroacetabular impingement and osteoarthritis: a case report, *J. Orthop. Surg.* 21 (1) (2013) 117–121.

Open Access

This article is published Open Access at [sciencedirect.com](https://www.scienceopen.com). It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.