Case Report
Hip Knee J. Vol. 5, No. 2, 2024, pp.30-34
p-ISSN: 2723-7818
e-ISSN: 2723-7826
http://dx.doi.org/10.46355/hipknee.v5i2.180

UNICOMPARTMENTAL KNEE ARTHROPLASTY IN MEDIAL OSTEOARTHRITIS KNEE WITH ANTERIOR CRUCIATE DEFICIENCY: A CASE REPORT

Fendy[1]
[1] Soeradji Hospital Tirtonegoro Klaten, Central Java, Indonesia

ABSTRACT

Advantages of Unicompartmental Knee Arthroplasty (UKA) include the preservation of more tissue, maintenance of knee kinematics, and a faster recovery period. However historically absence of an ACL could affect knee stability and lead to various degenerative changes, such as intra-articular damage and knee instability. Case Presentation A 60-year-old female patient presented with severe left medial knee pain and functional limitations and persisted with conservative treatment. Clinical examinations revealed tenderness over the medial joint line, a positive varus stress test, and a Lachman test. Radiographic imaging confirmed severe medial compartment osteoarthritis with ACL deficiency without significant damage to other knee structures. Patient was diagnosed with medial compartment osteoarthritis in an ACL-deficient knee. UKA using Oxford medial unicompartment implant was performed cement inserted into the medial compartment. The patient followed a routine rehabilitation program. At the 2 days after operation patient can full extension of the knee and flexion of the knee about 120 degrees with minimal pain. Radiographic evaluation showed adequate implant positioning. The discussion several studies have shown that with meticulous patient selection and accurate surgical technique, UKA can yield favorable outcomes even in cases of ACL deficiency. Preserving the ACL is critical to the success of UKA but achieving good results in ACL-deficient patients if the joint proves stable and well-balanced intraoperatively is possible. The conclusion is UKA might be a viable option for patients with medial compartment osteoarthritis with ACL deficiency.

Keywords: Unicompartmental knee arthroplasty, osteoarthritis, anterior cruciate ligament deficiency, case report.

Article History:
Submission : August 31st, 2024
Revision : August 31st, 2024
Accepted : August 31st, 2024

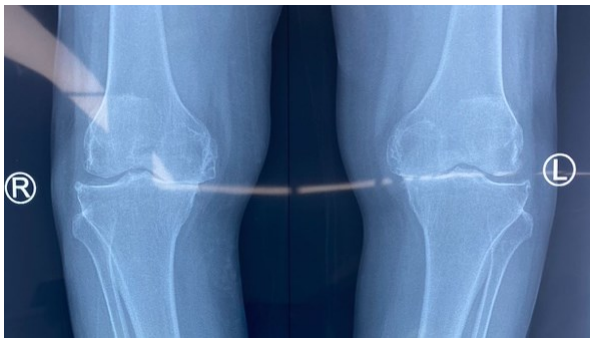
Corresponding Author:
Fendy
Soeradji Hospital Tirtonegoro Klaten, Central Java, Indonesia
fendyihkscito123@gmail.com

INTRODUCTION

Unicompartmental knee arthroplasty (UKA) is an effective surgical intervention for patients with isolated compartment osteoarthritis, offering advantages over total knee arthroplasty (TKA) such as preservation of knee kinematics, quicker recovery, and fewer complications (1,2). However, the presence of anterior cruciate ligament (ACL) deficiency in patients poses a significant challenge for the application of UKA. Traditionally, ACL deficiency has been considered a contraindication for UKA due to concerns about joint stability, implant survival, and long-term outcomes (3,4). This case report examines the feasibility and outcomes of UKA in a patient with medial compartment osteoarthritis and ACL deficiency.

PRESENTATION OF CASE

A 60-year-old female patient, a housewife, presented with severe left medial knee pain and functional limitations despite exhaustive conservative treatments including physiotherapy, bracing, and nonsteroidal anti-inflammatory drugs (NSAIDs). History of trauma was denied. Clinical examinations revealed tenderness over the medial joint line, positive varus stress test, and a Lachman test indicating ACL deficiency. Range of motion examination showed full extension and flexion about 150 degrees. Radiographic anteroposterior imaging confirmed severe medial compartment osteoarthritis and an intact lateral compartment. At lateral view confirmed posteromedial osteoarthritis due to chronic anterior cruciate ligament deficiency.



(A)

(B)

Figure 1. (A) Anterior-posterior x-ray of the left knee, (B) Lateral view

Given the localized nature of the osteoarthritis and the patient's desire to avoid TKA, a decision was made to proceed with UKA. The surgical procedure was conducted using a minimally invasive approach. Intraoperative findings confirmed the preoperative diagnosis, and a cemented Oxford partial knee replacement was implanted. Care was taken to ensure proper alignment and balance of the knee joint.

Postoperatively, the patient was enrolled in a structured rehabilitation program focusing on restoring range of motion and strengthening periarticular muscles. At the 2 days after operation patient can full extension of the knee and flexion of the knee about 120 degrees with minimal pain

Figure 2. UKA Implant Placement

DISCUSSION

Management of medial osteoarhtritis knee accompanied by ACL deficiency is a challenging dilemma for orthopedic surgeons. UKA performed in ACL deficient knees shows higher failure rate due to the altered joint kinematics due to recurrent anterior translation of the tibia in relation to the femur, cause higher polyethylene wear and consequent osteolysis due to increased motion of the joint knee, the instability increases also risk of mobile bearing insert luxation (5). Therefore, various strategies have been proposed including ACL reconstruction (ACLR), high tibial osteotomy (HTO) with or without ACLR, UKA with or without ACLR and totzl knee arthroplasty (TKA). TKA may be an overtreatment strategy if the degenerative changes are restricted solely to the medial compartment due to ACL deficiency or instability. ACLR combined with HTO has been criticized as it shows a threefold higher rate of graft failure compared to UKA (6).

Figure 3. Post-operative images

In medial osteoarthritis knee with ACL-D we can face two potential scenarios. For elderly patients presenting lower activity levels, OA is the primary disease with a concomitant secondary ACL deficiency. For these patients a UKA without ACLR can be considered, respecting couple technical aspects: reduction of the tibial slope and tensioning of the collateral ligaments. Change of the posterior tibial slope contribute to tensioning of the collateral ligaments, its reduction increases collateral ligament tension. It is recommended that the posterior tibial slope should not exceed 7°(7).

The successful outcome in this case challenges the traditional contraindications of UKA in ACL-deficient knees. Several studies have shown that with meticulous patient selection and precise surgical technique, UKA can achieve favorable outcomes even in the presence of ACL deficiency (8,9). The preservation of the ACL is crucial for the success of UKA; however, in cases where the ACL is deficient, the procedure can still be viable if the joint is stable and well-balanced intraoperatively. The benefits of UKA, including less invasiveness, quicker recovery, and preservation of normal knee

kinematics, make it an attractive option for suitable patients (10,11).

CONCLUSIONS

This case report highlights the potential of UKA in patients with medial compartment osteoarthritis and ACL deficiency, emphasizing the importance of careful patient selection and surgical expertise. The findings suggest that UKA can offer significant benefits in terms of pain relief and functional improvement for selected ACL-deficient patients. Further research with larger patient cohorts and longer follow-up periods is necessary to establish the long-term outcomes and refine the selection criteria for UKA in this patient population.

REFERENCES

1. Liddle AD, Pandit H, Judge A, Murray DW. Cementless fixation in Oxford unicompartmental knee replacement: a multicentre study of 1000 knees. J Arthroplasty. 2014;29(5):936-942.
2. Berger RA, Meneghini RM, Jacobs JJ, Sheinkop MB, Della Valle CJ, Rosenberg AG. Results of unicompartmental knee arthroplasty at a minimum of ten years of follow-up. J Bone Joint Surg Am. 2005;87(5):999-1006.
3. Pandit H, Jenkins C, Gill HS, Murray DW. Minimally invasive surgery in unicompartmental knee arthroplasty: the experience of the Oxford group. Knee Surg Sports Traumatol Arthrosc. 2014;15(3):257-260.
4. Kozinn SC, Scott R. Unicondylar knee arthroplasty. J Bone Joint Surg Am. 1989;71(1):145-150.
5. Li, Guoan & Papannagari, Ramprasad & DeFrate, Louis & Yoo, Jae & Park, Sang & Gill, Thomas. (2007). The effects of ACL deficiency on mediolateral translation and varus-valgus rotation. Acta orthopaedica. 78. 355-60. 10.1080/17453670710013924.
6. Mancuso, F., Hamilton, T.W., Kumar, V. et al. Clinical outcome after UKA and HTO in ACL deficiency: a systematic review. Knee Surg Sports Traumatol Arthrosc 24, 112–122 (2016). https://doi.org/10.1007/s00167-014-3346-1
7. Pandit H, Beard DJ, Jenkins C, Kimstra Y, Thomas NP, Dodd CA, Murray DW. Combined anterior cruciate reconstruction and Oxford unicompartmental knee arthroplasty. J Bone Joint Surg Br. 2006 Jul;88(7):887-92. doi: 10.1302/0301-620X.88B7.17847. PMID: 16798990
8. Goodfellow JW, O'Connor JJ, Murray DW. The Oxford meniscal unicompartmental knee replacement. J Bone Joint Surg Br. 1998;80(6):983-989.
9. Price AJ, Webb J, Topf H, Dodd CA, Goodfellow JW, Murray DW. Rapid recovery after Oxford unicompartmental arthroplasty through a short incision. J Arthroplasty. 2001;16(8):970-976.
10. Lombardi AV Jr, Berend KR, Walter CA, Aziz-Jacobo J, Cheney NA. Is recovery faster for mobile-bearing unicompartmental than total knee arthroplasty? Clin Orthop Relat Res. 2009;467(6):1450-1457.

11. Newman JH, Pydisetty RV, Ackroyd CE. Unicompartmental or total knee replacement: the 15-year results of a prospective randomized controlled trial. J Bone Joint Surg Br. 2009;91(1):52-57.