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Meniscal bearing dislocation following minimally invasive Oxford medial unicompartmental knee arthroplasty treated with simple open reduction: Case report

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ABSTRACT

INTRODUCTION: Dislocation of polyethylene insert is one of the most common complications of mobile bearing–medial unicompartmental knee arthroplasty (MUKA). Bearing dislocation was diagnosed by radiograph examination in these cases upon trivial injury.

CASE PRESENTATION: We reported one case of meniscal bearing dislocation after an Oxford MUKA treated with a simple open reduction technique.

CLINICAL DISCUSSION: Simple open reduction surgery without change of the bearing and the use of knee brace for 6 months was effective in preventing re-dislocation.

CONCLUSION: Mobile bearing dislocation is one of the most common complications in mobile-bearing MUKA. Besides the prevention of technical errors, usage of UKA with a frequency of 10–15 per year is recommended to increase the surgeon's learning curve.

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1. Introduction

Although unicompartmental knee arthroplasty (UKA) surgery has been performed since the 1970s, only after 1990s it started to gain interests and only until recently it has been employed in our country [1]. Several studies reported the poor outcome of this procedure initially, but current improvements of implant designs and evolution of surgical technique promote increasing satisfactory results [2–4]. Song et al. also mention the drop of complication results after a first 100 cases performed [5].

Although the efficacy of UKA remains controversial for the longer-term results, it is beneficial since the procedure requires minimal damage to the skin and surrounding tissue with less bony resection which promotes rapid healing and retaining of the knee function [3,6,7]. With lower mortality and morbidity rates com-

pared to the conventional total knee arthroplasty (TKA) and strict case selection inclusion criteria, this procedure has been more favoured in the older age patients group with many comorbidities [4,8].

However, several studies reported that meniscal bearing dislocation is one of the most common complications in UKA [5,9]. We would like to report one case of meniscal bearing dislocation after a medial UKA treated with simple open reduction technique. This paper was written according to the SCARE guideline [10].

2. Presentation of case

Fifty-one-year-old female with 156 cm height and 59 kg weight (body mass index, BMI of 24.2 kg/cm²) was diagnosed with medial knee osteoarthritis (OA) with a correctible varus deformity of 10 degrees and performed MUKA by LAP (Fig. 1). Significant reduction of pain and discomfort on the left knee with rapid recovery were noted with pre-operative WOMAC (Western Ontario and McMaster Universities Osteoarthritis Index) score was 62 and one-month post-operative WOMAC score was 32. Six weeks after the surgery patient had been able to walk without aid.

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Fig. 1. Radiograph examination on left knee, AP radiograph after the first surgery.

Three months following the surgery when the walking patient was tripped over and fell on her left knee. On an outpatient examination, pain and swelling were complained especially about the medial joint line, but the ability to walk was retained. Range of motion was limited from twenty to sixty degrees. Radiograph examination was taken of the left knee showing lateral dislocation of meniscal bearing with an intact implant (Fig. 2) and it was decided to proceed for open reduction of the dislocated bearing.

Open reduction surgery with a mini-open incision was performed the day after which took 15 min approximately from skin incision to wound closure. After reduction has been performed, the knee obtained a full range of movement and stability. Post-operative radiograph exam was taken (Fig. 3) and additional simple knee brace was applied to prevent re-dislocation. The patient was able to walk with the aid the following day and brace was kept for 6 months. At the same time of brace removal, the patient was allowed to walk without aid. One year following surgery patient had no complaints and WOMAC score was 28.

3. Discussion

Unicompartmental osteoarthritis (OA) can be treated by various techniques such as arthroscopic multiple drilling, proximal tibial osteotomy, total knee arthroplasty (TKA), and unicompartmental knee arthroplasty (UKA) [11]. Either TKA or UKA is recommended for a medial unicompartmental OA. Compared to the conventional TKA, UKA has the benefit of more speedy recovery due to the minimal bone resection, preservation of knee function due to the saving of anterior and posterior cruciate ligament, patellofemoral joint,



Fig. 2. Radiograph examination pre-revision surgery on AP radiograph showing lateral dislocation of meniscal bearing.



Fig. 3. Post-revision radiograph examination in an AP radiograph showing the correct position of meniscal bearing.

and opposite compartment of the knee. Hence UKA has less blood loss, less postoperative pain, earlier rehabilitation and better range of motion [11]. Due to this benefit, with strict inclusion criteria UKA surgery has been more common these days.

Although UKA has many superiorities compared to TKA, there are still concerns regarding the long term follow-ups and higher revision rate [4]. Complications reported in the early postoperative period for UKAs are component dislocation, loosening, fracture of the plateau or femoral condyle, and OA of the lateral compartment period [12]. One of the most common complication encountered is the meniscal bearing dislocation. Dislocation rate for a mobile UKA is ranging from 0.9% to 5.3% according to literature [13–16].

However, it is more common in the Asian population compared to Western [14] population who need to sit on the floor cross-legged, kneeling, or squatting.

Anterior and lateral dislocation is the most common modes and lateral dislocation being the most benign symptom because it remains in the joint space [17]. Patients with lateral dislocation could walk and possibly had their daily lives unaware of dislocation such found in the first patient.

Possible etiologies for polyethylene (PE) dislocation are components malposition, flexion and extension gap mismatch, impingement caused by femoral condyle osteophytes and delayed elongation of the medial collateral ligament (MCL) over time [18]. Thus, a more distal or more proximal placement of the UKA implant in the medial compartment would inevitably lead to two different joint line levels that probably would severely alter the biomechanics and tribology of a knee. As the femoral surface is only resurfaced, there will be an excessive cutting of the tibia to get space for the prosthesis in the compartment (distalization of the tibial joint line). Not only the tibial component will rest on more fragile cancellous bone but an excessive tibial cutting also leads to shifting the contact point of the femur to the periphery of the tibial plateau because of the plateau's funnel shape [19].

In our case, we found no remaining osteophytes in the posterior condyle and the dislocated bearings were intact. There were no component malposition or gap mismatch and the bearings were relocated using the same bearing. Stretched MCL could be the main reason for a meniscal bearing dislocation. Hence we protect the knee with a knee brace for a further 6 months until the ligament strengthens, which proven to be beneficial. Current follow up until one year post revision patient is happy and never had any complain.

Prevention of bearing dislocation could be enhanced by learning technical pitfalls and tips. However, several kinds of literature also described the decrease of failure rate with increasing cases or a learning curve. Song et al., 2009 [5] described that complications in UKA decreased significantly after the first 100 consecutive surgeries. Lindstrand et al., 2000 [20] believed that for an optimal result, the surgeon must perform a minimum of 10–15 UKA per year. In our experience, dislocation occurred during the first 20 cases and besides that, there were no other complications occurred. However, further studies with larger cases and longer follow up time is required to understand bearing dislocation in UKA better.

4. Conclusions

Mobile bearing dislocation is one of the most common complications in mobile-bearing MUKA. Besides the prevention of technical errors, usage of UKA with a frequency of 10–15 per year is recommended to increase a surgeon's learning curve.

Declaration of Competing Interest

The authors report no declarations of interest.

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Ethical approval

Not applicable, this is not a research project.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy

of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Ludwig AP: Conceptualization, Methodology, Data curation. **Ismail HD:** Writing - Original draft preparation, Investigation. **Franky H:** Supervision. **Sholahuddin R:** Software, Validation. **Jessica F:** Writing - Reviewing and Editing.

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