# Medium-term results after partial (unicompartmental) knee arthroplasty with a mobile platform

G. Lukanov [1(✉)], B. Antonov[1], P. Tanchev, K. Kaykchiyan[1], R. Simeonov[1], P. Kinov [1]
[1] Clinic of Orthopaedics and Traumatology, "Tsaritsa Yoanna - ISUL" University Hospital
georgelukanov@gmail.com

**Abstract—**Background: Early gonarthrosis is characterized by involvement of one compartment of the knee joint, most commonly the medial tibio-femoral joint (AMOA). Surgical treatment includes debridement, chondroplasty, corrective osteotomy, unicondylar knee arthroplasty (UKA), or total joint replacement (TKE). Materials and results: The aim of the study is a retrospective analysis of the clinical results after UKA from a cohort of patients operated at the Clinic of Orthopedics and Traumatology, University Hospital "Queen Joanna - ISUL", Medical University Sofia. Patients in the cohort reported a excellent functional outcome, with the exception of two of the participants in the study. Conclusion: UKA is a suitable surgical alternative for teams that have experience with the technique. Careful consideration of the preoperative parameters of patients, as well as creating acceptable and realistic expectations about the postoperative results are crucial for a positive end result.

**Keywords—** knee arthroplasty, mobile platform

## 1. Introduction

The early stages of gonarthrosis (knee osteoarthritis) are characterized by involvement of one compartment of the knee joint, most commonly the Medial Tibiofemoral Compartment. Surgical treatment includes debridement, chondroplasty, corrective osteotomy, unicondylar knee arthroplasty (UKA) or total joint replacement (TJR). Only the affected compartment of the joint is replaced during unicondylar arthroplasty. The technique was introduced in the 50s of the last century. Over time, the design of the implants has changed and arthroplasty was introduced in the early 70s, which replaced both joint surfaces for the first time, giving rise to modern unicondylar arthroplasty. A retrospective study of results was performed in 17 patients with mobile bearing (Oxford) UKA.

## 2. Materials and methods

The aim of the study is a retrospective analysis of clinical results after mobile bearing UKA of the cohort of patients operated at the Clinic of Orthopaedics and Traumatology, "Tsaritsa Yoanna" University Hospital (ISUL), Medical University Sofia. A total of 17 patients have been operated using the technique. All patients were indicated according

to the extended criteria of the Oxford Group. The follow-up included 11 patients (3 women and 8 men) with 11 unicondylar knee arthroplasty operated in 2017. The average age of the patients in the operation was 69.09 years (from 62 to 78 years). The mean period of clinical and radiographic follow-up is 4 years (6 months to 4 years). The Oxford Partial Knee Microplasty implant (Zimmer, USA) was used. In all cases, a minimally invasive technique with medial parapatellar access was used.

## 3. Results

Patients in the cohort reported excellent functional outcome, with the exception of two of the study participants. One of the patients had an unsatisfactory postoperative outcome (persistent pain and need of walking aids on multiple occasions). The second patient was revised due to the progression of osteoarthritis in the contralateral compartment of the joint and the development of gout - a total knee endoprosthesis was placed. Patients were monitored by face and profile radiographs. All components were radiographically stable and no progression of osteoarthritis was observed in the contralateral compartment of the joint. The average Knee Society Score is 83.1 points, the average Oxford Knee Score is 42.7 points and the average WOMAC Score is 89 points. No luxation or excessive wear of the polyethylene insert was observed in the cohort patients.


Figure 1. Preoperative radiography of the affected knee joint in two projections (face and profile).


Figure 2. Postoperative radiography in two projections (face and profile).

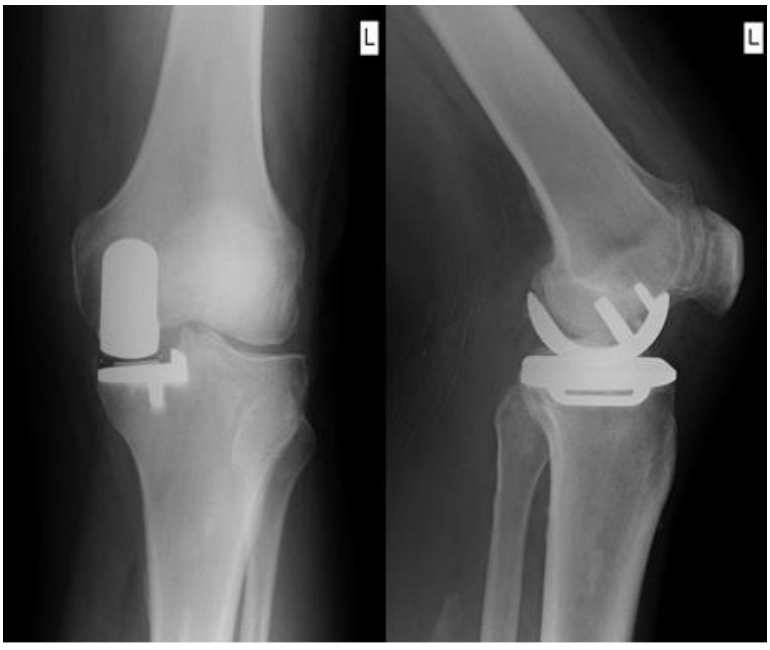


Figure 3. Follow-up of the third year after operation - radiography in two projections (face and profile).

## 4. Discussion

UKA is a minimally invasive technique that allows preservation of the kinematics of the knee. Intervention is a suitable alternative for treatment of early gonarthrosis. The advantages of the method are in the preservation of the ligament and the opposite compartment and the biomechanics of the knee, respectively. Less surgical trauma also leads to less postoperative pain, which is a key factor for rapid recovery and greater postoperative movement. Compared to High Tibial Osteotomy (HTO), it can be used in more advanced osteoarthritis and in older patients. Using mobile bearing UKA we obtained favorable outcome in our series. A discussion persists in the literature regarding better results compared to total knee arthroplasty, as well as easier future revision.[1,2]

Traditional indications for UKA presented by Cozinn and Scott include degenerative knee arthritis affecting one compartment, age > 60 years, body weight < 82 kg (180 lb), low activity requirements, range of motion ≥ 90°, flexion contracture ≤ 5°, angular deformity < 15 ° and no symptoms and signs of inflammatory arthritis.[3] These indications are too conservative and allow a small proportion of patients with AMOA to be operated on. Over time, the accumulation of experience with this technique, improvements in the design of implants and longer follow-up of UKA patients allows for the future expansion of indications for the use of the technique.[4] Traditional indications for UKA presented by Cozinn and Scott include degenerative knee arthritis affecting one compartment, age > 60 years, body weight < 82 kg (180 lb), low activity requirements, range of motion ≥ 90°, flexion contracture ≤ 5°, angular deformity < 15 ° and no symptoms and signs of inflammatory arthritis.[i] These indications are too conservative and allow a small proportion of patients with AMOA to be operated on. Over time, the accumulation of experience with this technique, improvements in the design of implants and longer follow-up of UKA patients allows for the future expansion of indications for the use of the technique.[5,6] Initial atrophy of the patellofemoral joint is also considered a relative contraindication.[7]

## 5. Conclusion

Thorough preoperative assessment is especially important when performing partial knee arthroplasty. Clinical presentation (in particular preoperative BMI and range of motion), degrre of arthritis and joint involvement, as well as other variables such as psychosomatic status are crucial for the precise indications for the technique.

Mobile bearing UKA is a suitable surgical alternative for treatment of medial unicompartmental knee arthritis. Of utmost importance is experienced surgical team and proper selection of patients using correct indications, as well as creating acceptable and realistic expectations about postoperative results.[8,9]

## 6. References


1. Siman H, Kamath AF, Carrillo N, Harmsen WS, Pagnano MW, Sierra RJ. Unicompartmental Knee Arthroplasty vs Total Knee Arthroplasty for Medial Compartment Arthritis in Patients Older Than 75 Years: Comparable Reoperation, Revision, and Complication Rates. J Arthroplasty. 2017 Jun;32(6):1792-1797. doi: 10.1016/j.arth.2017.01.020. Epub 2017 Jan 24. PMID: 28215968.
2. Lyons MC, MacDonald SJ, Somerville LE, Naudie DD, McCalden RW. Unicompartmental versus total knee arthroplasty database analysis: is there a winner? Clin Orthop Relat Res. 2012 Jan;470(1):84-90. doi: 10.1007/s11999-011-2144-z. PMID: 22038173; PMCID: PMC3237994.
3. Kozinn SC, Scott R. Unicondylar knee arthroplasty. J Bone Joint Surg Am. 1989 Jan;71(1):145-50. PMID: 2643607.
4. Kim KT. Unicompartmental Knee Arthroplasty. *Knee Surg Relat Res*. 2018;30(1):1-2. doi:10.5792/ksrr.18.014
5. Pandit H, Jenkins C, Gill HS, Smith G, Price AJ, Dodd CA, Murray DW. Unnecessary contraindications for mobile-bearing unicompartmental knee replacement. J Bone Joint Surg Br. 2011 May;93(5):622-8. doi: 10.1302/0301-620X.93B5.26214. PMID: 21511927.
6. Murray DW, Goodfellow JW, O'Connor JJ. The Oxford medial unicompartmental arthroplasty: a ten-year survival study. J Bone Joint Surg Br. 1998 Nov;80(6):983-9. doi: 10.1302/0301-620x.80b6.8177. PMID: 9853489.
7. Berend KR, Lombardi AV Jr, Morris MJ, Hurst JM, Kavolus JJ. Does preoperative patellofemoral joint state affect medial unicompartmental arthroplasty survival? Orthopedics. 2011 Sep 9;34(9):e494-6. doi: 10.3928/01477447-20110714-39. PMID: 21902142.
8. Pandit H, Hamilton TW, Jenkins C, Mellon SJ, Dodd CA, Murray DW. The clinical outcome of minimally invasive Phase 3 Oxford unicompartmental knee arthroplasty: a 15-year follow-up of 1000 UKAs. Bone Joint J. 2015 Nov;97-B(11):1493-500. doi: 10.1302/0301-620X.97B11.35634. PMID: 26530651.
9. Panni AS, Vasso M, Cerciello S, Felici A. Unicompartmental knee replacement provides early clinical and functional improvement stabilizing over time. Knee Surg Sports Traumatol Arthrosc. 2012 Mar;20(3):579-85. doi: 10.1007/s00167-011-1613-y. Epub 2011 Jul 12. PMID: 21748391.


## Authors

**G.Lukanov** is member of the Bulgarian Orthopedic and Traumatology Association (BOTA). He works as an ortopaedic surgeon at Clinic of Orthopaedics and Traumatology, "Tsaritsa Yoanna - ISUL" University Hospital, Sofia, Bulgaria. He is a resident at the clinic with interests in the field of joint preservation surgery, as well as arthroplastic surgery and sports medicine.

**B. Antonov** is member of the Bulgarian Orthopedic and Traumatology Association (BOTA). He works as an ortopaedic surgeon at. He is a practicing Orthopaedics and

Traumatology surgeon at the clinic. His interests are in the field of Traumatology, as well as primary and revision arthroplasty.

**P. Tanchev** is member of the Bulgarian Orthopedic and Traumatology Association (BOTA). He works as an ortopaedic surgeon at Clinic of Orthopaedics and Traumatology, "Tsaritsa Yoanna - ISUL" University Hospital, Sofia, Bulgaria. He is a practicing Orthopaedics and Traumatology surgeon at the clinic. His interests are in the field of Traumatology, as well as primary and revision arthroplasty.

**K. Kaykchiyan** is member of the Bulgarian Orthopedic and Traumatology Association (BOTA). He works as an ortopaedic surgeon at Clinic of Orthopaedics and Traumatology, "Tsaritsa Yoanna - ISUL" University Hospital, Sofia, Bulgaria. He is a practicing Orthopaedics and Traumatology surgeon at the clinic. His interests are in the field of Traumatology.

**R. Simeonov** is member of the Bulgarian Orthopedic and Traumatology Association (BOTA). He works as an ortopaedic surgeon at Clinic of Orthopaedics and Traumatology, "Tsaritsa Yoanna - ISUL" University Hospital, Sofia, Bulgaria. He is a resident at the clinic with interests in the field of arthroplastic surgery, traumatology and complex revision surgery.

P. Kinov is member of the Bulgarian Orthopedic and Traumatology Association (BOTA). He works as an ortopaedic surgeon at Clinic of Orthopaedics and Traumatology, "Tsaritsa Yoanna - ISUL" University Hospital, Sofia, Bulgaria. He is the chief of clinic with interests in the field of arthroplastic surgery and complex revision surgery. Professor Kinov is also head of the department of Orthopaedics and Traumatology at the Medical University of Sofia.