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KNEE ARTHROPLASTY

Lateral unicompartmental knee arthroplasty: is really a good option?

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Abstract

Introduction Lateral unicompartmental knee arthroplasties (LUKA) account for only < 1% of all knee arthroplasties and for only 5–10% of all unicompartmental knee replacements. This means that there is less published literature on these procedures and that the surgeon's experience with them is smaller than with medial UKA. The aim of this study was to analyze the survival and the clinical-functional outcomes of LUKA according to the type of bearing surface (all-polyethylene versus metal-backed) used.

Materials and methods This was a retrospective study including 42 LUKAs operated between 2009 and 2021. Two fixed polyethylene-bearing models were used: the all-polyethylene ACCURIS knee (38%) and the metal-backed Triathlon PKR system (62%). Demographic parameters, knee range of motion (ROM), tibiofemoral alignment, implant survival (as estimated with the Kaplan–Meier curve), and clinical-functional outcomes (as measured with the Knee Society Score) were analyzed.

Results Average patient age was 65.5 (range, 36–87) years and mean follow-up was 8.2 (range, 2.1–12.8) years. Thirty LUKAs (71.4%) were implanted in women. The main reason for performing a LUKA was osteoarthritis (88.1%). No patient developed post-surgical complications or had to be re-operated. Overall LUKA survival was 100% at 1-year and 5-year's follow-up. Knee Society Score, knee ROM and tibiofemoral alignment all improved significantly post-surgery ($p < 0.001$). The clinical Knee Society Score increased from 46.5 ± 14.5 pre-surgery to 93.5 ± 10.3 post-surgery, the functional Knee Society Score increased from 48.1 ± 13.5 pre-surgery to 94.6 ± 9.3 post-surgery, maximum flexion increased from 108.5 ± 8.7 degrees pre-surgery to 121 ± 8.9 degrees post-surgery and tibiofemoral alignment was corrected from 13.1 ± 1.74 degrees pre-surgery to 5.7 ± 0.8 degrees post-surgery. There were no statistically significant clinical-functional improvement or knee ROM differences between groups ($p < 0.05$, respectively).

Conclusion LUKA is a valid and definitive option for patients with lateral tibiofemoral osteoarthritis, with a survival rate of > 95% at 5-years follow-up. Clinical-functional outcomes are the same, irrespective of the tibial component used.

Keywords Unicompartmental knee arthroplasty · Unicondylar arthroplasty · Lateral knee osteoarthritis · Survival · Osteoarthritis

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Introduction

According to the literature, isolated lateral compartment osteoarthritis (OA) is predominant in less than 10% of patients with knee OA [1, 2]. When conservative methods fail, unicompartmental knee arthroplasty (UKA) is a well-established treatment [3–5]. It is estimated that lateral unicompartmental knee arthroplasties (LUKA) account for only < 1% of the total number of knee arthroplasties and for only 5–10% of all unicompartmental knee replacements [5–7]. Moreover, LUKA is more technically demanding than medial compartment UKA due to its anatomic and biomechanical characteristics [8–10]. As a result, there is less published literature and the surgeon's experience with the procedure is smaller than with medial UKA. As compared with total knee arthroplasty (TKA), UKA is less invasive; usually preserves more bone, cartilage and soft tissue; allows faster patient recovery; results in less postoperative morbidity and mortality; is less costly; provides more natural knee function; and allows greater range of motion and more physiological knee kinematics [11–15].

Three UKA models are commercially available, which differ in the type of bearing and the materials used. The first one, is a fixed bearing all-polyethylene implant. The second one, is a fixed bearing metal-backed implant, and the third one is a mobile bearing metal-backed implant. The functional results of fixed bearing as compared with mobile bearing implants are contradictory in the literature. On the one hand, some studies show that there are no significant differences between them regarding functional outcomes or the incidence of revision [16–19]. On the other hand, when UKA is used for the lateral compartment, mobile bearing metal-backed models are associated with a four-fold higher risk of revision and poor survival rate than fixed bearing metal-backed models [18, 20]. The main reason for revision of these implants has been found to be bearing dislocation [21–24]. For this reason, different authors recommend the fixed bearing metal-backed design for the lateral compartment [23, 25, 26]. In addition, in appropriately selected patients LUKA may lead to better clinical outcomes and range of motion (ROM) than total knee arthroplasty (TKA) [8, 27].

To the best of our knowledge, limited evidence is available on the survival of fixed bearing LUKA implant designs. The literature available includes case series, a medley of data including medial UKA cases [5], and a few studies analyzing the survival of fixed bearing all-polyethylene or metal-backed LUKA. In a multicenter study including 268 LUKAs in 252 patients with at least 5 year's follow-up, Deroche et al. [28] analyzed a series made up entirely of fixed bearing implants (66% metal-backed and 34% all-polyethylene). These authors concluded that LUKA was associated with satisfactory survival rates (85.4% at 10 years and 79.4% at 20 years), comparable to those of medial UKA; good functional results, and excellent long-term patient satisfaction [28].

The aims of this study were to describe a series of patients who underwent lateral compartment UKA; with a view to analyzing implant survival as a function of the type of bearing used (fixed all-polyethylene *vs* metal-backed) and evaluating the clinical-functional outcomes of LUKA. Our null hypothesis was that the survival and the clinical-functional results of LUKA will be different depending on the type of bearing used.

Materials and methods

A retrospective study was performed of patients who received a LUKA in our hospital from 2009 to 2021. The Regional Ethical Review Board approved this study, which was conducted in accordance with the Helsinki Declaration.

Patients were included in the study based on the classical indication for UKA defined by Kozinn and Scott [29, 30]: compartment symptoms unresponsive to conservative treatment for at least 6 months, knee ROM from 0 to 100 degrees, a correctable non-structural deformity in the coronal plane (below 15–20 degrees), competent cruciate and collateral ligaments, radiological evidence of Kellgren and Lawrence grade 3/4 OA [31], avascular necrosis of the lateral femoral condyle, an osteochondral injury circumscribed to the lateral tibiofemoral compartment, and a minimum follow-up of two years. Radiographic evidence of asymptomatic patellofemoral OA was not considered a contraindication for UKA [32]. Patients who did not meet all the inclusion criteria were excluded.

Of the 365 UKAs operated (329 patients), 323 were excluded either because they were performed in the medial compartment (321 medial compartment UKAs in 287 patients) or due to loss of follow-up (two LUKAs in two patients). The total number of included cases was therefore 42 LUKAs (40 patients). All patients were operated by one same surgeon with long experience in this type of arthroplasty. Two UKA models were used. The first model was the ACCURIS fixed bearing all-polyethylene prosthesis (Smith and Nephew, Memphis, USA). The second model was the Triathlon fixed bearing metal-backed PKR system (Stryker, Montreux, Switzerland). Both the femoral and the tibial component were cemented with the same type of cement. We changed the implant design (ACCURIS implant to PKR implant) due to problems in its distribution. The cohort's demographic parameters are shown in Table 1.

Demographic variables; operated side; cause of compartment degeneration (OA, avascular necrosis or osteochondral injury); pre- and postoperative knee ROM, as measured with

Table 1 Patients' demographic parameters

	ACCURIS	Triathlon PKR	P value
Number of UKAs (N = 42)	16	26	
Age, SD	70 ± 7.7	62 ± 11.8	0.0352*
Male/female	7/9	5/21	0.158
operated side			0.465
Right (%)	11 (34.8)	21 (65.2)	
Left (%)	5 (50)	5 (50)	
Cause of tibiofemoral degeneration			0.775
Osteoarthritis (%)	14 (37.8)	23 (62.2)	
Avascular necrosis (%)	2 (50)	2 (50)	
Osteochondral injury (%)	0	1 (100)	
Total follow-up (years), SD	11.41 ± 0.98	6.21 ± 2.36	< 0.001*

*Statistically significant

SD standard deviation

UKA unicompartimental knee arthroplasty

a goniometer; and pre- and postoperative tibiofemoral alignment, as measured with standing X-rays, were analyzed. In addition, a determination was made of survival rates, of post-operative complications (medical, surgical), of the causes leading to UKA revision, and of functional-clinical outcomes using the Knee Society Scoring System (KSS) in the pre-operative and last medical check-up.

Surgical procedure

All the procedures were performed under epidural anesthesia on a standard operating table with the knee flexed at 90 degrees. A standard technique [8] was used in all cases, which comprised the following ten points:

1. A skin incision was made at the superior pole of the patella, extending it distally toward the tibial tuberosity (minimum lateralization).
2. A lateral arthrotomy was performed and the joint was opened.
3. The condition of the medial compartment and the patellofemoral joint was inspected.
4. Two pins were placed to separate the patella and the skin. We placed a pin in the external knee epicondyle to separate the joint capsule and the skin of the external knee area. The other pin was inserted in the intercondylar notch to keep the patella displaced medially. With these two pins, we were able to have a better visualization. When implants are placed, these pins are removed.
5. Any osteophytes in the intercondylar notch were removed to avoid potential impingement between these osteophytes and the anterior cruciate ligament.
6. Lateral femoral condyle osteophytes should not be removed, as the femoral component often sits on these osteophytes to avoid the screw home mechanism. This was described in other articles [8, 33].
7. An extramedullary guide was used to make the tibial cut. Tibial resection should be minimal (2–4 mm maximum) with a slope of 0 degrees and internal rotation of 10–15 degrees. Although a transpatellar portal could be made to provide internal rotation of the tibial component, we did not usually do it. We protected the patellar tendon and moved it medially with a separator.
8. The femoral cut was made with a cutting guide. However, the lateral aspect of the femoral cutting block must follow the lateral aspect of the condyle to prevent excessive internal rotation during knee extension as a result of the screw-home mechanism occurring due to the natural size disparity between the lateral and the medial femoral condyles.
9. The size of the tibial tray, the keel and the tibial component was determined and the flexion and extension gaps were assessed with the trial components in situ. A successful LUKA requires undercorrection of the deformity to avoid excessive strain in the medial compartment.
10. The surgical site was abundantly flushed with saline solution, the arthrotomy was closed, a drain was placed, and skin closure was performed.

After the procedure, all patients followed a standard rehabilitation protocol that included full weight-bearing ambulation, muscle exercises, and supervised physiotherapy.

Statistical analysis

All statistical tests were carried out using Stata 12.0 software (Data Analysis and Statistical Software, Texas, USA) for Macintosh. Descriptive statistics were calculated for the sample and expressed as average and standard deviation. UKA survival was estimated by a Kaplan–Meier survival analysis. The endpoint was “revision for any reason” (defined as a procedure in which at least one of the components was revised). Survival estimates were limited to one- and five-years’ follow-up because the PKR Triathlon group had an average follow-up of 5 years. Categorical variables were compared between the groups using either the Chi-squared test or Fisher’s Exact Test; continuous variables were compared using Student’s t-test or Mann–Whitney U tests. A paired Student’s t-test or a Wilcoxon test was used to compare pre- versus. postoperative KSS scores. Statistical significance was set at a p value of 0.05. Confidence intervals were calculated, where possible, at a 95% confidence level.

Results

Average patient age was 65.52 ± 10.9 (range, 36–87) years; 30 (71.43%) were women and 12 (28.57%) were men. A total of 76.19% (32/42) of LUKAs were performed on the right-knee and 23.81% (10/42) on the left-knee. The main reason for performing a LUKA was the presence of Kellgren and Lawrence grade 3/4 tibiofemoral OA (37/42 patients, 88.1%) (Figs. 1 and 2), followed by avascular necrosis of

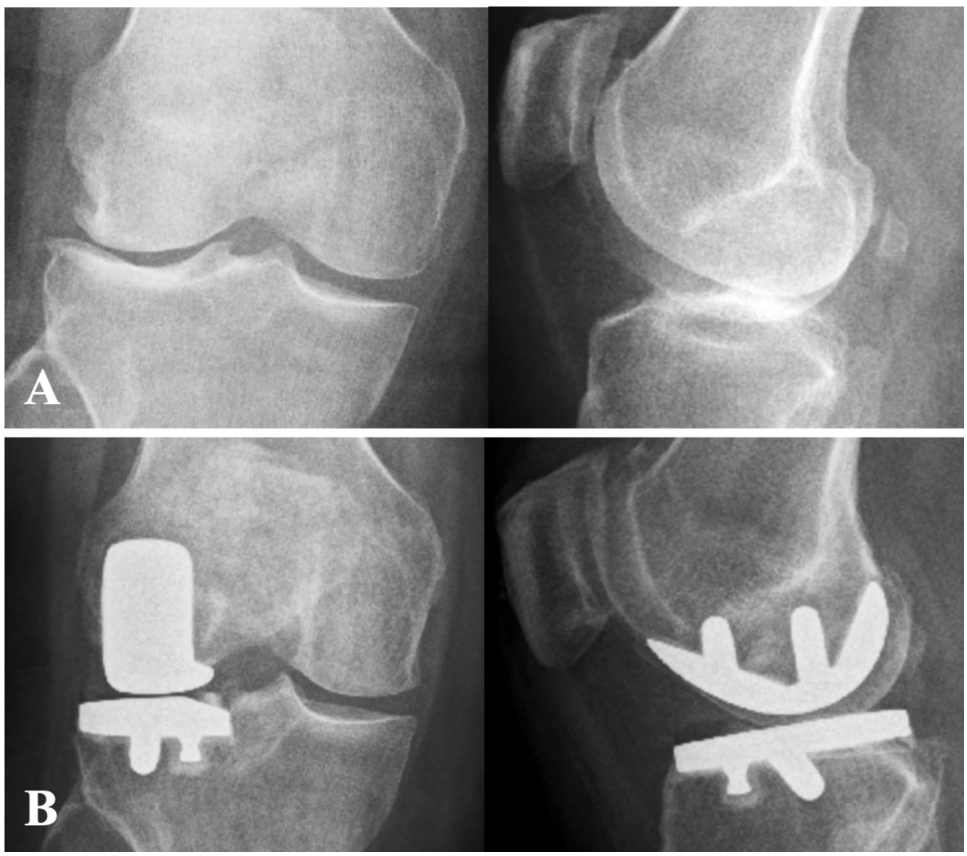

Fig. 1 Lateral tibiofemoral osteoarthritis (**A**) treated by lateral unicompartimental arthroplasty (Triathlon PKR, fixed-bearing metal-backed tibial component) (**B**)

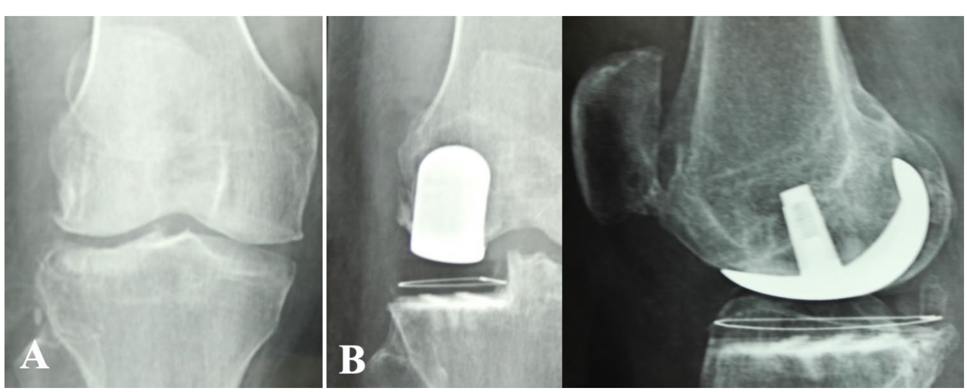

Fig. 2 Lateral tibiofemoral osteoarthritis (**A**) treated by lateral unicompartimental arthroplasty (ACCURIS, fixed-bearing all-polyethylene tibial component) (**B**)

the femoral condyle (four patients, 9.52%), and osteochondral injury of the femoral condyle (one patients, 2.38%). Total follow-up time was 8.2 (range, 2.1–12.8) years. There were no significant differences between the groups regarding gender, operated side or reason for surgery ($p=0.158$; $p=0.465$; $p=0.775$, respectively, Table 1). However, age and follow-up time were different between the groups ($p<0.05$, Table 1). The longest follow-up and the oldest patients corresponded to the ACCURIS UKA group. The average age was 70 ± 7.7 years-old in ACCURIS UKA group versus 62 ± 11.8 years-old in Triathlon PKR UKA group (Table 1; $p<0.05$). On the other hand, the follow-up was 11.41 (range, 9.7 to 12.8) years in in ACCURIS UKA group versus 6.21 (range, 2.1–10.2) years in Triathlon PKR UKA group (Table 1; $p<0.05$).

No patient developed post-surgical complications (medical or surgical) or had to be reoperated. Overall UKA survival was 100% at one year's and five year's follow-up (Fig. 3). KSS outcomes, ROM and the tibiofemoral alignment improved significantly post-surgery ($p<0.001$). The clinical KSS increased from 46.5 ± 14.5 to 93.5 ± 10.3 (Fig. 4); functional KSS increased from 48.1 ± 13.5 to 94.6 ± 9.3 (Fig. 4); maximum flexion increased from 108.5 ± 8.72 to 121 ± 8.9 degrees and tibiofemoral alignment was corrected from 13.1 ± 1.74 to 5.7 ± 0.8 degrees. There were no statistically significant differences regarding clinical-functional improvement or range of motion between groups ($p<0.05$) (Table 2). However, patients in the Triathlon PKR group obtained a greater correction of their tibiofemoral alignment than those in the ACCURIS group (− 8.1 ± 1.1 vs − 6.4 ± 1.9, $p=0.01$; Table 2). In the

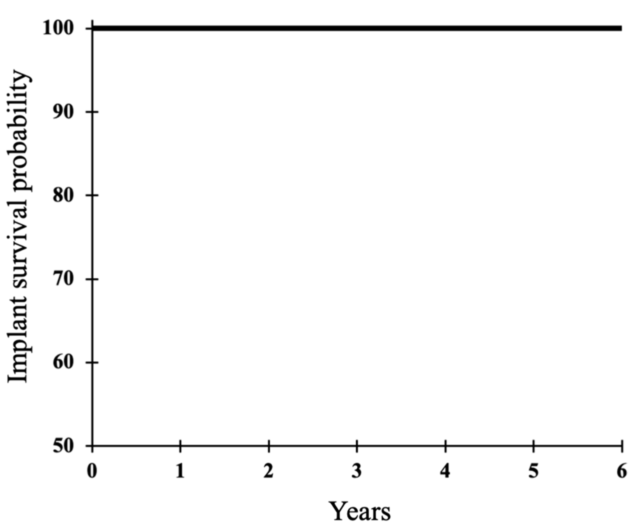

Fig. 3 Kaplan–Meier overall survival graph for lateral unicompartmental knee arthroplasty. Overall UKA survival was 100% at 1- and 5-years' follow-up

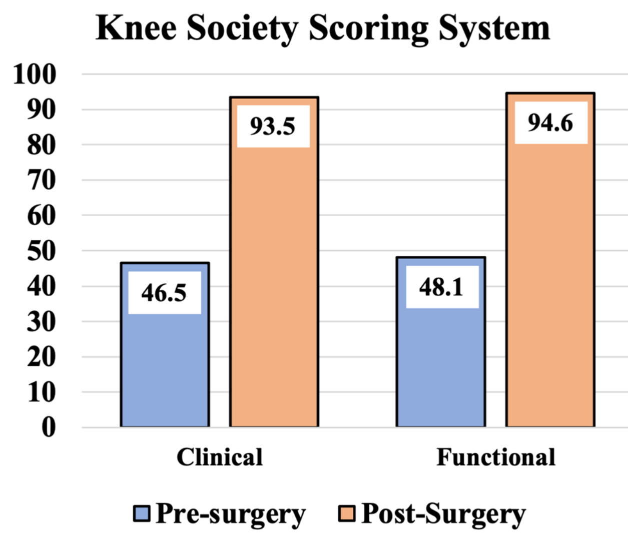

Fig. 4 Pre- and post-operative Knee Society Score. Clinical KSS increased from 46.5 ± 14.5 pre-surgery to 93.5 ± 10.3 post-surgery (difference + 47.02, p value = < 0.001); functional KSS increased from 48.1 ± 13.5 pre-surgery to 94.6 ± 9.3 post-surgery (difference 46.54, p value = < 0.001). Post-operative Knee Society Score was measured in the last medical check-up

last medical check-up, no femoral or tibial radiolucency was observed in X-rays.

Discussion

This retrospective study analyzed the short- and mid- long-term survival of two LUKA models, as well as the clinical-functional outcomes and complications associated with them. The clinical relevance of this study lies in the fact that use of the two LUKA models demonstrated excellent short- and mid- long-term survival rates (Fig. 3), with significant post-operative improvements in clinical-functional outcomes, knee ROM and tibiofemoral alignment ($p<0.001$, Table 2).

Demographic parameters were similar between groups except for length of follow-up and patient age (Table 1). The longest follow-up and the oldest patients corresponded to the ACCURIS group. Tadros et al. [34] analyzed functional outcomes, mortality, revision rates and survival in patients treated with medial UKA. Patients were stratified into three cohorts based on age: 60–69, 70–79 and 80–89 years. The authors did not find differences between octogenarians and younger patients.

Several differences exist between medial UKA and LUKA. Firstly, femoral condyle osteophytes should not be removed when performing a LUKA; secondly, the tibial slope in LUKA must be 0 degrees; thirdly, the tibial plateau cut must be performed at 10–15 degree's internal rotation;

Table 2 Clinical-functional results according to the type of tibial tray used

	ACCURIS	Diff	Triathlon PKR	Diff	p value
KSS clinical[a]					0.059
Pre-surgery	50.5 ± 14.7	40.4 ± 14.8	44 ± 14.1	51.1 ± 18.6	
Last medical check-up	90.9 ± 6.6		95 ± 11.8		
Functional KSS[a]					0.366
Pre-surgery	46.8 ± 15.7	44.1 ± 18.7	48.8 ± 12.3	48.1 ± 13.8	
Last medical check-up	90.9 ± 9.7		96.9 ± 8.4		
Maximum flexion, degrees					0.404
Pre-surgery	105 ± 7.1	14.4 ± 8.3	110 ± 9.1	11.4 ± 12.8	
Last medical check-up	119 ± 6.8		121 ± 10		
Tibiofemoral angle, degrees					**0.001***
Pre-surgery	12.1 ± 1.9	− 6.4 ± 1.9	13.7 ± 1.4	− 8.1 ± 1.1	
Last medical check-up	5.8 ± 0.9		5.6 ± 0.7		

*Statistically significant

[a]Knee Society Scoring System: < 60: poor; 61–69: Fair; 70–79: Good; 80–100: Excellent

and, finally, consideration must be given to the screw-home mechanism [8].

As regards the LUKA technique used, a lateral parapatellar approach was used in every patient in this study although most orthopedic surgeons are considerably more acquainted with the medial approach. Using a medial parapatellar approach, Sah and Scott [35], obtained excellent results at 5.2 years post-surgery. However, Edmiston et al. [36] compared the medial and lateral approaches and found that the lateral approach resulted in greater knee flexion. However, these authors found no differences regarding rates of revision or clinical outcomes [36]. Although our preference is for the lateral approach, the choice between a lateral or a medial approach should always be based on the surgeon's preference, taking into account the characteristics of the patient [37].

Table 3 summarizes the studies focusing exclusively on LUKA. The first thing that strikes the eye is the low number of LUKAs implanted. Adding up all the UKAs implanted yields a mean of 58 UKAs per surgeon approximately. The number of LUKAs implanted in our study was higher than the mean resulting from the published literature (42 versus 32 LUKAs; Table 3), all of them performed in one single center. On the other hand, there is significant heterogeneity in the UKA models used by different authors (Table 3).

The choice between mobile bearing and fixed bearing designs remains controversial [51] as the revision rates of both models have been found to be equivalent [17, 52]. Mobile bearing UKA presents the advantage of lower rates of polyethylene wear [53] and improved kinematics [54] when compared with fixed bearing designs. However, mobile bearing UKAs are associated with polyethylene bearing dislocation, a specific complication of this particular type of design, which is far more prevalent in the lateral than in the medial compartment [22, 24]. The kinematic explanation for this kind of failure is that, during flexion, the lateral collateral ligament is lax whereas the medial collateral ligament is tight, the lateral compartment being able to distract by an average of seven millimeters, while the average distraction of the medial compartment is limited to only two millimeters [9]. Our study only included fixed bearing UKAs in an effort to exclude the risk of early dislocation of the polyethylene insert. According to Peersman et al. [17], the choice between fixed- and mobile-bearing designs should be determined by surgeon preference.

Fratini et al. [25] performed a meta-analysis including 21 articles to examine the influence of implant design on the failure of LUKA. They observed that fixed bearing all-polyethylene implants resulted in higher failure rates than (fixed- or mobile-bearing) metal-backed implants. In a finite-element analysis, Small et al. [55] observed significantly higher strain levels in all-polyethylene implants. In a comparison of all-polyethylene with metal-backed implants, Scott et al. [56] found that all-polyethylene implants were associated with increased microscopic subchondral damage [56]. We agree with Fratini et al. [25] and Hariri et al. [20] that fixed bearing metal-backed models should be the design of choice in LUKA given their seemingly lower failure rates and consequently longer implant survival.

Numerous studies show excellent short-, medium- and long-term UKA survival, with estimated 3.3 year survival rates of 98.5% [26], 5-year survival rates between 82 and 100% [35, 39, 49] and 15-year survival rates between 74.5 and 91.4% [41, 48]. These survival rates are comparable with our results, where the estimated overall survival rate was 100% at one- and five-year's follow-up (Table 3).

Our series of 42 LUKAs found clinical and functional results, as measured by KSS, comparable to those published in the literature (Table 3). Clinical KSS was 93.5 ± 10.3 and functional KSS was 94.6 ± 9.3 (Fig. 4), in line with

Table 3 Survival, complications and functional outcomes of lateral unicompartmental knee arthroplasty

Authors	Ref	Year	No. of UKA	No. of centers or surgeons	Implant model	Fixed or mobile bearing	All-polyethylene or metal-backed	KSS	Complications	Survivorship	Follow-up, years (range)
Marmor	[38]	1984	13	1 surgeon	Marmor Knee	Fixed	All-polyethylene	–	2 UKA revisions	–	7.4 (2.5–9.8)
Gunther et al	[39]	1996	53	2 surgeons	Oxford Knee	Mobile	Metal-backed	–	3 Late infections 6 Bearing dislocations 1 Tibial component loosening 1 Stress tibial fracture 1 Peroneal nerve palsy	82% at 5 yr	5 (2.5–9.8)
Ohdera et al	[40]	2001	38	1 center	Marmor Knee; Oxford Knee; PCA Knee; Ommifit	Both	Both	–	2 UKA revision	–	8.2 (5–15.7)
Ashraf et al	[41]	2002	83	4 surgeons	St Georg Sled UKR	Fixed	All-polyethylene	–	2 Superficial wound infection 1 Thrombosis 15 UKA revision	74.5% at 15 yr	9 (2–21)
Pennington et al	[42]	2006	29	–	Miller-Galante	Fixed	Both	–	–	–	12.4 (3.1–15.6)
Forster et al	[43]	2007	38	1 surgeon	Preservation UKR	Both	Both	–	3 UKA revisions in Mobile bearing	–	2
Volpi et al	[44]	2007	28	1 surgeon	Miller-Galante	Fixed	Metal-backed	–	–	–	1–5
Sah et al	[35]	2007	48	1 center 1 surgeon	Brigham unicondylar prostheses; Press Fit Condylar; Press Fit Condylar sigma; Preservation UKA	Fixed	Both	KSS clinical, 89 KSS function, 80	–	100% at 5.4 yr	5.2 (2–14)
Argenson et al	[33]	2008	38	2 surgeons	Marmor Knee; Alpina; Miller-Galante; ZUK	Fixed	Both	KSS clinical, 88 KSS function, 78	3 Thrombosis 5 UKA revisions	84% at 16 yr	12.6 (3–23)
Lustig et al	[45]	2011	54	1 center	HLS Evolution Uni	Fixed	All-polyethylene	KSS clinical, 91.7 KSS function, 83.3	4 UKA revisions 2 Thrombosis	98% at 10 yr	8.4 (5–15.7)
Lustig et al	[46]	2012	13	2 centers 2 surgeons	HLS Uni Evolution; Marmor II; Miller-Galante	Fixed	Both	KSS clinical, 88 KSS function, 87	3 UKA revisions	80% at 15 yr	10.2 (3–22.1)
Berend et al	[47]	2012	100	2 centers	Repicci II; Vanguard M	Fixed	Metal-backed	KSS clinical, 94 KSS function, 89	1 UKA revisions	–	3.5 (2–6.75)

Table 3 (continued)

Authors	Ref	Year	No. of UKA	No. of centers or surgeons	Implant model	Fixed or mobile bearing	All-polyethylene or metal-backed	KSS	Complications	Survivorship	Follow-up, years (range)
Lustig et al	[48]	2014	46	1 center 1 surgeon	HLS evolution Uni	Fixed	All-polyethylene	KSS clinical, 95.1 KSS function, 82.2	2 Thrombosis 7 UKA revisions	91.4% at 15 yr	14.2 (10.1–18)
Fornell et al	[49]	2018	41	3 surgeons	Oxford Knee	Mobile	Metal-Backed	–	1 UKA revisions 1 bearing dislocation	97.5% at 5 yr	4.1 (2–7)
Edmiston et al	[36]	2018	65	1 center 3 surgeons	ZUK; Miller-Galante	Fixed	Metal-backed	KSS clinical, 76.2 KSS function, 73.7	4 UKA revisions	94% at 6.8 yr	6.8 (3.8–10)
Walker et al	[24]	2018	363	3 centers	Oxford Knee	Mobile	Metal-Backed	–	36 UKA revisions	90.1% at 3 yr 85% at 5 yr	3 (1–7.75)
Gaggiotti et al	[50]	2021	29	1 surgeon	ZUK; Allegretto; MG	Fixed	Metal-backed	KSS clinical, 91.9 KSS function, 91.4	–	100% at 6.2 yr	6.2 (1–19.5)
Hariri et al	[20]	2023	120	1 center 8 surgeons	Oxford Knee	Mobile Fixed	Metal-Backed	–	13 UKA revisions 1 UKA revision	78.7% at 3.4 yr 98.3% at 2.7 yr	3.4 (1–5) 2.7 (1–5)
Hariri et al	[26]	2023	133	1 center 6 surgeons	Oxford Knee	Fixed	Metal-Backed	–	2 UKA revision	98.5% at 3.3 yr	3.3 (1–8.5)
Our series	–	–	42	1 center 1 surgeon	Accuris; Triathlon PKR	Fixed	Both	KSS clinical, 93.5 KSS function, 94.6	–	100% at 5 yr	8.2 (2.1–12.8)

Comparison between our series and other studies the figures published by Lustig et al. [45, 48] and Berend et al. [47], and even superior to those reported by other authors, such as Sah and Scott [37], Argenson et al. [33] and Edmiston et al. [36]. On the other hand, patients in our series exhibited a great improvement in maximum flexion, which went from 108.5 ± 8.72 to 121 ± 8.9 degrees, in line with the published literature [33, 47, 50], and Lustig et al. [45, 46, 48]. Undercorrection of limb malalignment is essential to avoid degeneration of the medial compartment due to overload during the static and dynamic phase of gait [8]. In our series, the postoperative tibiofemoral angle was 5.7 ± 0.8 degrees valgus.

This study is not without limitations. First of all, given its retrospective nature with all the inherent limitations of such study designs. A second limitation lies in the small number of LUKAs analyzed. It must be said, however, that a power calculation showed that this study has a statistical power of 100% and that our series was similar in this respect to other articles in the literature. Finally, no comparisons are made in the study with mobile-bearing UKAs.

Conclusion

Lateral unicompartmental arthroplasty is a valid and definitive option for patients with lateral tibiofemoral osteoarthritis. Short- and medium-term survival rates are excellent. The patients' clinical-functional status improved after the procedure and the results obtained did not vary as a function of the kind of tibial component used.

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Declarations

Conflict of interest Each author certifies that he has no commercial associations (consultancies, stock ownership, equity interest, patent/licensing arrangements) that might pose a conflict of interest in connection with the submitted article.

Ethical approval Approval for this study was given by the Regional Ethical Review Board at our institution.

Informed consent All patients, before participating, gave written consent to participate in this study after having received oral and written information.

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