Migliorini et al.
BMC Musculoskeletal Disorders (2024) 25:985
https://doi.org/10.1186/s12891-024-08112-7

BMC Musculoskeletal Disorders

RESEARCH

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Revision of unicompartmental knee arthroplasty: a systematic review

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Abstract

Background Unicompartmental knee arthroplasty (UKA) is a surgical procedure for managing osteoarthritis of one joint compartment, most commonly the medial side. This systematic review investigates the causes of UKA revision. The outcomes of interest were establishing the revision rate, time to revision, and the most common causes of revision in the long- and midterm follow-up.

Methods This study was conducted according to the 2020 PRISMA statement. In October 2024, the following databases were accessed: PubMed, Web of Science, Google Scholar, and Embase. All the clinical studies investigating the rate and causes of revision in UKA were accessed. Only studies with a minimum of 10 years of follow-up were considered.

Results Data from 56 studies (13,540 patients) were collected. Of them, 65.6% were women. The mean length of the follow-up was 13.1 ± 3.0 years. The mean age of the patients was 65.6 ± 5.6 years, and the mean BMI was 28.5 ± 2.2 kg/m^2. Revisions were performed in 8.8% (2641 of 30,140) of implanted UKAs. The mean time to revision was 6.5 ± 2.6 (range, 2.5 to 13.0) years.

Conclusion 8.8% (2641 of 30,140) of UKAs were revised at a mean time of 6.5 ± 2.6 years.

Level of evidence Level IV, systematic review.

Keywords Knee, Unicompartmental knee arthroplasty, Revision, Survivorship

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Introduction

Osteoarthritis (OA) of the knee has a worldwide incidence of 3.8% in the general population, and the lifetime risk of developing symptomatic knee OA is 44.7% [1, 2]. Most patients develop OA in only one compartment of the knee [3, 4]. In these patients, unicompartmental knee arthroplasty (UKA) could be recommended [5–7]. UKA is performed in up to 12% of all arthroplasties, and approximately 90% of all UKAs are done for medial compartment OA [8–10]. Between 25 and 48% of patients who suffer from knee OA are suitable for a UKA [11, 12]. Compared to the traditional total knee arthroplasty (TKA), UKA is associated with greater knee kinematics, range of motion, clinical outcomes and functional performances and preserves more bone stock [5, 13–15]. Moreover, UKA preserves the anterior cruciate ligament (ACL) and the contralateral and patellofemoral compartments [5, 13–15]. The rate of complications for UKA is significantly lower than that of TKA [16]. However, UKA has reduced survivorship compared to TKA [13]. The traditional indications for UKA were first suggested by Kozinn et al. [17] in 1989: the presence of unicompartmental OA and an efficient ACL, varus deformity < 5°, range of motion > 90° without flexion contracture and body mass index (BMI) < 30 kg/m^2. Their criteria limited the number of patients eligible for UKA to approximately 6% up to 8% [18, 19].

Medium- and long-term studies demonstrated outstanding outcomes of UKA at ten years, with survival greater than 95% [20–26]. Several clinical investigations have evaluated the revision rate of UKA; however, a comprehensive and updated systematic review summarising the evidence is missing. Therefore, this systematic review investigates the causes of UKA revision. The outcomes of interest were establishing the revision rate, time to revision, and the most common causes of revision in the long- and midterm follow-up. In addition, the present study investigates whether patient characteristics influence the revision rate.

Methods

Eligibility criteria

All the clinical studies investigating the rate, time, and causes of revision of UKA were accessed. Only studies published in peer-reviewed journals were considered. According to the author´s language capabilities, English, German, Italian, French and Spanish articles were eligible. According to the Oxford Centre of Evidence-Based Medicine Campo [27], studies level I to IV of evidence were considered. Reviews, opinions, letters, and editorials were not considered. Only studies which reported a minimum of 10 years of follow-up were considered. Missing quantitative data under the outcomes of interests warranted the exclusion of the study.

Search strategy

This study was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses: the 2020 PRISMA statement [28]. The following algorithm was established:

- Problem: OA of one compartment of the knee;
- Intervention: UKA;
- Outcomes: revision rate, time to revision, causes of revision;
- Timing: minimum ten years follow-up.

In October 2024, the following databases were accessed: PubMed, Web of Science, Google Scholar, and Embase. No time constraint was set for the search. A detailed framework of keywords used in each database is shown in the appendix. No additional filters were used in the database search.

Selection and data collection

Two authors (F. C. and L. S.) independently performed the database search. All the resulting titles were screened by hand, and the abstract was accessed if suitable. The full text of the abstracts which matched the topic was accessed. If the full text was not accessible or available, the article was not considered for inclusion. A cross reference of the bibliography of the full-text articles was also performed for inclusion. Disagreements were debated and mutually solved by the authors. In case of further disagreements, a third author (R. V.) took the final decision.

Data items

Two authors (F. C. and L. S.) independently performed data extraction. The following data were extracted at baseline: author, year of publication and journal, length of the follow-up, number of patients with related mean age, and BMI. Data concerning the rate, the cause, and the timing of revision was extracted. Data was collected in Microsoft Office Excel version 16.72 (Microsoft Corporation, Redmond, USA). The revision was considered as any subsequent re-operation to correct or improve the outcome of previous surgery for complications, such as infections or hardware failures, or if the index surgery did not achieve the desired results.

Synthesis methods

The main author (F. M.) performed the statistical analyses using the IBM SPSS (version 25) software. For continuous variables, the mean and standard deviation were evaluated. For binary data, the revision rate and related subcategories were evaluated using the number of real observations divided by the number of events of each investigation. Dichotomic values are weighted on the total cumulative events and observations reported in the included studies.

Results

Study selection

The literature search resulted in 1789 articles. Of these, 1605 were excluded as they were duplicates. The remaining 184 articles were screened for eligibility. Of them, 116 articles were excluded as they did not match the eligibility criteria: study type and design ($N=23$), language limitations ($N=4$), and follow-up shorter than ten years ($N=89$). A further 12 studies were excluded as they missed quantitative data under the outcomes of interest. Finally, 56 studies were included: one randomised, controlled trial, 11 prospective, and 44 retrospective studies. The results of the literature search are shown in Fig. 1.

Studies characteristics and results of individual studies

A total of 30,140 UKAs were included. A majority of 65.6% were women. The mean length of the follow-up was 13.1 ± 3.0 years. The mean age of the patients was 65.6 ± 5.6 years, and the mean BMI was 28.4 ± 2.1 kg/m^2. The generalities and demographics of the included studies are shown in Table 1.

Synthesis of results

8.8% (2,641 of 30,140) of implanted UKAs were revised. The mean time to revision was 6.5 ± 2.6 (range, 2.5 to 13.0) years. Table 2 reports the main causes of revisions.

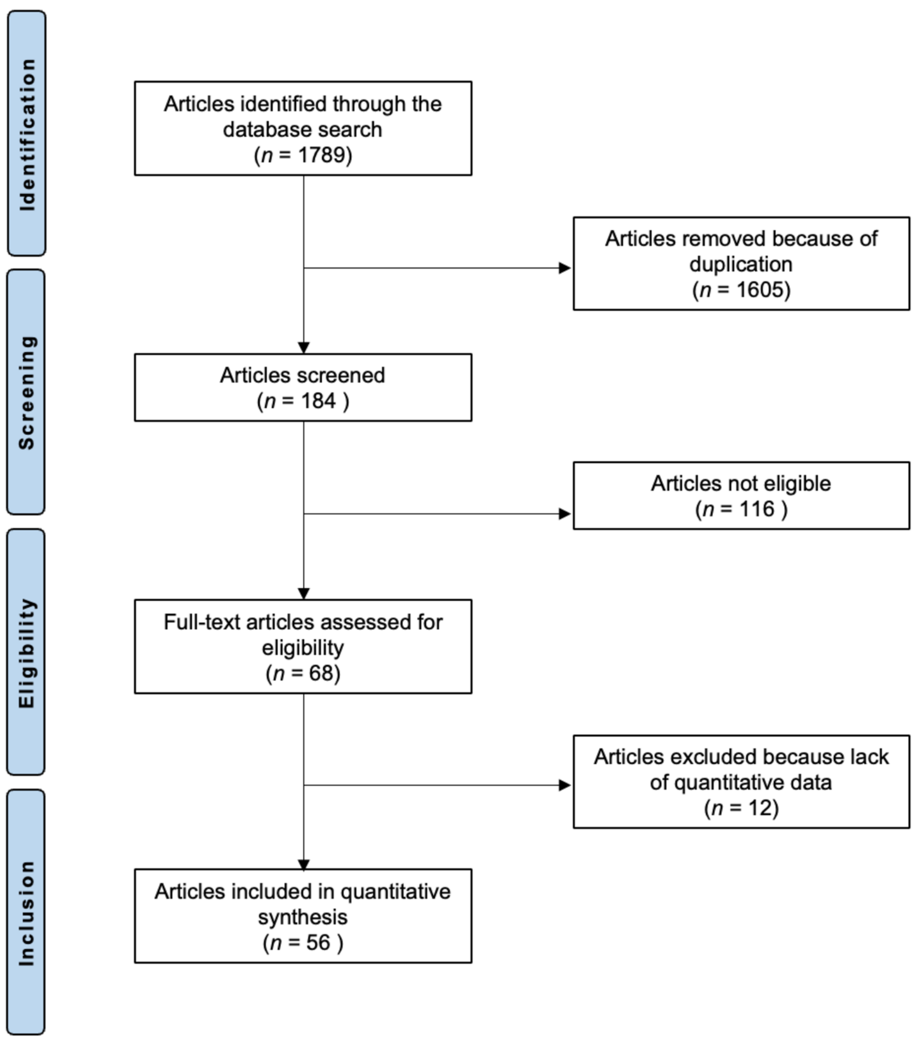

Fig. 1 PRISMA flow chart of the literature search

Table 1 Generalities and patient baseline of the included studies in the present systematic review

Author, year	Journal	Design	Follow-up (mean y)	Patients (n)	Knees (n)	Age (mean)	Women (%)	BMI (kg/m^2)	Manufacturer
Argenson et al., 2013 [21]	*J Bone Joint Surg Am*	retrospective	20.0	62	70	80			Cemented metal blacked Miller-Galante prosthesis
Berger et al., 2005 [29]	*J Bone Joint Surg Am*	prospective	12.0	51	62	68	66.7		Miller-Galante unicompartmental knee system (Zimmer, Warsaw, Indiana)
Bernal-Fortich et al., 2021 [30]	*J Arthrosc Jt Surg*	retrospective	10.4	78	78	65	75.6		Cemented, mobile-bearing Oxford Phase III medial UKA (Biomet Ltd, Bridgend, UK)
Bruce et al., 2020 [31]	*Knee*	prospective	10.0	184	214	70	46.2	32	Uniglide prosthesis (Corin Ltd., Cirencester UK)
Bruni et al., 2016 [32]	*Knee Surg Sports Traumatol Arthrosc*	retrospective	10.2	273	273	68	63.4	28.2	Unilateral medial UKA (DePuy, Preservation Uni)
Calkins et al., 2021 [33]	*J Arthroplasty*	retrospective	11.2	68	77	50	42.6	31.7	Miller-Galante or Zimmer prosthesis (Zimmer Warsaw, IN)
Carlson et al., 2022 [34]	*J Arthroplasty*	retrospective	11.4	134	157	64	46	32	Oxford mobile-bearing UKA
Cartier et al., 1996 [35]	*J Arthroplasty*	retrospective	12.0	54	60	65	35.2		Mamor prosthesis
Choy et al., 2017 [36]	*Knee*	retrospective	12.1	147	164	66	90.5		Oxford phase 3 mobile bearing UKAs (Biomet, Warsaw, IN, USA)
Crawford et al., 2023	*J Arthroplasty*	retrospective	15.0	182	219				
Di Martino et al., 2021 [37]	Knee Surg Sports Traumatol Arthrosc	retrospective	15.0	5948	6453	67	67.9		UKA not specified
Emerson et al., 2016 [38]	*Bone Joint J*	retrospective	10.0	173	213	67	45.1	29.87	Phase III mobile-bearing Oxford Knee (Zimmer Biomet, Warsaw, Indiana) and Phase III instrumentation
Emerson et al., 2008 [39]	*J Bone Joint Surg Am*	prospective	14.3	51	55	64	62.7		Medial compartment Oxford phase-2 implants (Biomet, Warsaw, Indiana)
Faour-Martín et al., 2013 [40]	*Int Orthop*	retrospective	10.4	416	492	59	60.0	27.1	Oxford Phase III Unicompartmental Knee Replacement procedure (Biomet, Warsaw, IN, USA)
Felts et al., 2010 [41]	*Orthop Traumatol Surg Res*	retrospective	11.2	62	65	55	53.2	28.0	Cemented metallic tibial tray (Miller-Galante, ZimmerTM, Warsaw, IN, USA)
Foran et al., 2013 [42]	*Clin Orthop Relat Res*	retrospective	19.0	51	62	58	54.8		Miller-Galante unicompartmental knee system (Zimmer, Warsaw, IN, USA)
Gioe et al., 2003 [43]	*Clin Orthop Relat Res*	prospective	11.0	427	516	67	55.3		Osteonics SCR design (Stryker Howmedica Oste- onics, Mahwah, NJ), Kirschner (Biomet, Inc, Warsaw, IN), and other designs

Table 1 (continued)

Author, year	Journal	Design	Follow-up (mean y)	Patients (n)	Knees (n)	Age (mean)	Women (%)	BMI (kg/m^2)	Manifacturer
Goh et al., 2021 [44]	*Knee*	retrospective	14.0	128	128	61	50.0	27.2	DePuy, Preservation and Miller-Galante
Heck et al., 1993 [45]	*Clin Orthop Relat Res*		14.8	255	294	68	62.7	25.5	Zimmer Compartmental I (Zimmer, Warsaw, Indiana), Zimmer Compartmental II, Marmor (Richards, Memphis, Tennessee) UKA
Heyse et al., 2011 [46]	*Arch Orthop Trauma Surg*	retrospective	10.9	52	52	67	57.7		Modular III UKA (Richards/Smith&Nephew), Genesis Unicondylar implant/renamed Accuris UKA (Smith&Nephew, Memphis, TN, USA)
John et al., 2011 [47]	*Int Orthop*		10.8	89	94	67			Miller-Galante unicompartmental knee replacements
Keblish et al., 2004 [48]	*J Arthroplasty*		11.0	100	147	68	70.0		Oxford and Low Contact Stress mobile-bearing unicompartmental knee designs first and second generation
Kennedy et al., 2018 [49]	*Knee Surg Sports Traumatol Arthrosc*	retrospective	10.3	818	1000	67	49.0	28.5	Medial meniscal bearing Oxford UKR
Kim et al., 2015 [50]	*Clin Orthop Surg*		10.0	128	166	62	96.1		Oxford phase 3 implants (Biomet, Warsaw, IN, USA)
Kim et al., 2018 [51]	*Knee Surg Relat Res*	prospective	12.1	80	106	54	100.0		Oxford phase 3 mobile bearing knee prosthesis (Biomet, Warsaw, IN, USA)
Lecuire et al., 2014 [52]	*Eur J Orthop Surg Traumatol*	retrospective	11.0	64	65	72	72.0	28	Cementless HA-coated ALPINA UNI anatomic unicompartmental knee (Biomet France, Valence)
Lewold et al., 1998 [53]	*Acta Orthop Scand*	prospective	20.0		14772	71	64.0		Marmor/Richards, St. Georg sledge/Endo-Link, Link uni, PCA uni, Oxford, Brigham, Gunston-Hult, Various
Lisowski et al., 2016 [54]	*Bone Joint J*	prospective	11.7	129	138	72		28.2	Oxford Phase III UKA
Lustig et al., 2014 [55]	*Int Orthop*	prospective	14.2	44	46	72	86.3	25.08	Cemented all poly tibia (HLS Uni Evolution, Tornier, Saint-Ismier, France)
Mannan et al., 2020 [56]	*Knee Surg Sports Traumatol Arthrosc*	retrospective	15.0	71	91	55	57.7	28.9	Cemented UKA (Zimmer, Warsaw, IN)
Manzotti et al., 2014 [57]	*Knee*	retrospective	14.7	51	53	65	61		Cemented implant (UC-Plus Solution, Smith and Nephew, Memphis, USA)

Table 1 (continued)

Author, year	Journal	Design	Follow-up (mean y)	Patients (n)	Knees (n)	Age (mean)	Women (%)	BMI (kg/m^2)	Manifacturer
Marmor et al., 1988 [58]	Clin Orthop Relat Res		11.0	51	60	65	55		UKA not specified
Mercier et al., 2010 [59]	*Int Orthop*	retrospective	14.9	40	43	69	40	28.3	Oxford UKA (Phase II implants, Biomet, Warsaw, IN, USA)
Moore et al., 2022 [60]	*Knee Surg Sports Traumatol Arthrosc*	retrospective	15	64		66	59.4	31	Cemented Oxford phase 3 meniscal bearing unicondylar prosthesis (Oxford Partial Knee, Biomet UK Limited, Bridgend, United Kingdom)
Naour et al., 2016 [61]	Tunis Med	retrospective	14.2	22	25	55	78.3	29.7	Modular tibial tray prostheses with cemented metal bases
Naudie et al., 2004 [62]	*J Bone Joint Surg Am*	retrospective	10.0	84	113	68	46.4		Miller-Galante medial unicompartmental knee arthroplasty
Neufeld et al., 2018 [63]	*J Arthroplasty*	retrospective	12.5	89	106	63	52.8	30.8	Cemented UKA (Oxford phase-III, Miller-Galante, Zimmer Biomet, Warsaw, IN)
Newman et al., 2009 [64]	*J Bone Joint Surg Br*	RCT	15.0	50	52	70	55.8		St. Georg Sled prothesis
O'Rourke et al., 2005 [65]	*Clin Orthop Relat Res*	retrospective	21.0	103	136	71	50.5		Marmor (Richards Orthopaedics, Memphis, TN) UKA
Ollivier et al., 2019 [66]	*J Arthroplasty*	retrospective	21.0	28	29	67	67.9	27.0	Miller-Galante, Zimmer, Warsaw, IN
Pandit et al., 2015 [67]	*Bone Joint J*	prospective	10.3	818	1000	66	52.0		Cemented Phase 3 Oxford medial UKA (Biomet, Swindon, United Kingdom)
Paratte et al., 2012 [68]	*Clin Orthop Relat Res*	retrospective	17.2	147	156	63	69.4	26.0	Miller-Galante; Zimmer, Warsaw, IN or oxford meniscal-bearing; Biomet, Warsaw, IN
Pennington et al., 2003 [69]	*J Bone Joint Surg Am*	retrospective	11.0	41	46	54	68.3	32.0	Miller-Galante Unicompartmental Knee System (Zimmer, Warsaw, Indiana)
Pennington et al., 2006 [70]	*J Arthroplasty*	retrospective	12.4	24	29	68	87.5	28.0	The Miller-Galante Unicompartmental Knee System (Zimmer, Warsaw, Ind)
Porteous et al., 2021 [71]	*Knee Surg Sports Traumatol Arthrosc*	prospective	13.3	385	479	72	61.8		St Georg Sled prothesis
Price et al., 2005 [20]	*Clin Orthop Relat Res*	retrospective	10.5	94	119	70	59.5		Oxford Knee Phase I (Biomet Ltd, Bridgend, UK), Oxford Knee Phase II prosthesis (Biomet Ltd., Bridgend, UK), Oxford Knee Phase III device (Biomet Ltd, Bridgend, UK)

Table 1 (continued)

Author, year	Journal	Design	Follow-up (mean y)	Patients (n)	Knees (n)	Age (mean)	Women (%)	BMI (kg/m²)	Manifacturer
Rossi et al., 2023 [72]	*Arch Orthop Trauma Surg*	retrospective	14.4	124	124	65	38.7	27.8	ZUK, previously "Zimmer® Uni-compartmental High Flex Knee" ZimmerBiomet Warsaw Indiana, now owned by Lima Corporate® or Smith and Nephew®)
Schlueter-Brust et al., 2014 [73]	*Knee*	prospective	10.7	234	240	72	20.0	29.8	The Uniglide prosthesis (Corin Ltd, Cirencester, United Kingdom)
Song et al., 2019 [74]	*Knee Surg Sports Traumatol Arthrosc*	retrospective	12.0	50	50	61	86.0	25.3	Allegretto prosthesis (Zimmer, Warsaw, IN, USA
Seo et al., 2019 [75]	*Arch Orthop Trauma Surg*	retrospective	10.2		96	63	95.8	25.3	Oxford (Biomet, Warsaw, IN, USA), Miller- Galante (Zimmer Inc., Warsaw, IN, USA)
Squire et al., 1999	*Clin Orthop Relat Res*	retrospective	18.0	103	140	71	50.5		Cemented Marmor Richards Orthopaedics Memphis, TN UKA
Steele et al., 2006 [76]	*J Bone Joint Surg Br*	retrospective	14.8	174	203	67	63.2		The St Georg Sled prosthesis (Wal-demar- Link, Hamburg, Germany)
Svärd et al., 2001 [77]	*J Bone Joint Surg Br*	retrospective	12.5	103	124	70	52.4		Oxford Knee Phase I (Biomet Ltd, Bridgend, UK)
Vorlat et al., 2006 [22]	*Knee Surg Sports Traumatol Arthrosc*	retrospective	10.5	140	149	66			The Oxford unicompartmental knee prosthesis (Biomet Merck, Swindon, UK)
Walker et al., 2019 [78]	*Knee Surg Sports Traumatol Arthrosc*	retrospective	11.2	113	126	62	52.2		Medial Oxford UKA
Yang et al., 2003 [79]	*N Z Med J*	retrospective	16.0	89	113	71	52.8		Marmor/Mod 2 (Richards Ortho-paedics, Memphis, TN, USA)

Table 2 Overall results (dichotomic values are weighted on the actual number of cumulative events and observations reported in the included studies considered for a given analysis)

Endpoint	Frequency
Revision rate	8.8% (2641 of 30,140)
Progression to TKA	30.4% (1,701 of 5,604)
Component exchange	1.5% (390 of 26,346)
Cause of revision:	
Aseptic loosening	3.1% (635 of 20,495)
Contralateral OA progression	2.6% (524 of 20,473)
Tibial loosening	1.7% (57 of 3,278)
Pain	1.9% (91 of 4,764)
Femoral loosening	1.5% (35 of 2,388)
Wear	0.8% (147 of 18,317)
Dislocation	0.5% (86 of 18,137)
Infection	0.5% (89 of 18,523)
Malalignment	0.2% (39 of 16,712)

Discussion

In the present systematic review, 8.8% (2641 of 30,140) of UKAs were revised at a mean time of 6.5 ± 2.6 (range, 2.5 to 13.0) years.

After the initial success related to the early use of UKA, the beginning enthusiasm was overtaken by its more limited clinical use, given a significantly lower long-term survival when compared with the survival rates of TKA from international registry reports [26, 37, 80–82]. Analysis of survival data showed that the survival rate of UKA implants ranged from about 78% to 89% at 15 years of follow-up [26, 37, 80–82]. Mohammad et al. [26] reported the highest survival rate after implantation of 8000 UKA Oxfords knee prostheses, with a survival rate of 89% at 15 years of follow-up. High-volume centres have significantly lower revision rates [5, 83]. Following this evidence, the literature has focused on analysing the leading causes of UKA failure. Many previously published investigations have reported aseptic loosening, OA progression, and pain as the most common cause of failure and aseptic loosening as the leading cause of UKA revision [37, 81, 82, 84, 85]. These data align with the major international registries [37, 81, 82]. However, most aseptic loosening occurs in the early period of UKA implantation and is mainly related to mistakes in surgical technique [81, 86]. Progress in biomaterials and surgical techniques and the introduction of robotic surgery may improve the survival of UKA [37, 87].

The current evidence suggests that surgical indication exerts no influence on implant survivorship. Only a few studies and no international registry investigated this aspect [37, 81, 82]. Reports by Di Martino et al. [37] and Chalmers et al. [88] suggested that UKAs implanted for primary OA did not show higher survival rates than UKAs implanted for post-traumatic OA, post-traumatic necrosis, or deformity. While most authors prefer cemented UKAs, several have reported favourable long-term survival rates even with uncemented hydroxyapatite-coated UKAs. Based on the previous reports, no difference in revision rate or complications has been found between uncemented and cemented UKAs. However, better pain control has been found with cemented implants [89, 90]. All-poly and metal-backed tibial component designs should be distinguished among cemented UKAs [91, 92]. The advantages of all-poly tibial components include less bone resection, lower dislocation risk, and more straightforward revision surgeries compared with metal-backed components [92, 93], which instead are characterized by better load distribution, modularity, and the possibility of limiting revision to replacement of the polyethylene liner exclusively. However, it has a higher risk of posterior PE liner wear [93, 94]. A previous investigation demonstrated excellent overall survivorship, with no substantial differences in revision rates between the two implanted designs at a 10-year follow-up [95]. Therefore, the long-term advantage of one or the alternative implant design remains controversial. Nouta et al. [96] and, more recently, Sessa et al. [92] reported better long-term clinical results for UKA with metal-backed tibial than all-poly components. Despite the improved clinical outcomes, patients treated with metal-backed tibial component implants experienced higher revision rates than patients with an all-poly tibial component implanted [92]. The additional failures in the metal-backed group were mainly related to subsidence and aseptic loosening, commonly associated with poor component fixation [92]. Therefore, while clinically, metal-backed tibial components have superior clinical outcomes compared to all-poly tibial components, one has to reckon with the higher risk of mechanical failure of this implantation in the long term. Hence, proper metal-backed tibial component fixation should be emphasised to reduce the failure rate related to aseptic loosening [91, 92, 96].

The type of liner implanted in the UKA also needs to be considered. Arthroplasty registries, reporting data from high-volume centres that compared the type of UKA liner implanted, did not show a clear advantage between the two liner types [89, 97, 98]. Similarly, a previous meta-analysis of 25 studies (4696 patients) found no difference in the revision rate, aseptic loosening, deep infections, fractures, and progression of OA to the contralateral compartment at approximately 45.8 months [97].

Mobile-bearing implants had almost no liner wear compared with fixed-bearing implants. In contrast, they had a higher failure and revision rate, mainly related to aseptic loosening and OA progression of the healthy compartment [10, 99]. Therefore, despite different design concepts, both bearings would report similar long-term results, and the debate remains unresolved [37].

Younger patients with single-compartment OA and higher functional demands were at greater risk of complications and failure following UKA related to wear and aseptic loosening of implanted components [100, 101]. Therefore, UKA was recommended for less active patients of advanced age (≥ 60 years). With the development of innovative surgical techniques and biomaterials, more studies have demonstrated favourable results of UKA in patients younger than 60 regarding clinical and functional outcomes [51, 102–107].

The literature supporting the lateral UKA procedure for isolated lateral compartment OA is lower than that reported for the medial compartment OA [108–112]. Lateral UKA performed about 90% less than medial UKA [109]. Furthermore, from a biomechanical point of view, the kinematics of the lateral compartment differ significantly from the medial one. Therefore, the lateral UKA has often been regarded as more technically demanding than a medial UKA [108, 112]. Studies on the initially implanted lateral UKAs showed more complications and failures with the prosthetic implant revision need than medial UKA [110, 112, 113]. Most of the failures were related to bearing dislocation, which led, over time, to the development of a domed lateral UKA with more satisfactory clinical outcomes [111, 113]. On the contrary, a recent clinical trial on 203 patients found no difference in Oxford Knee Score and complications between lateral and medial UKA [114]. A recent series of 265 domed mobile bearing lateral UKAs demonstrated 92% survival at an 8-year follow-up [111]. Therefore, a lateral UKA is still viable for isolated lateral compartmental OA. However, careful patient selection and prosthetic replacement are essential for a successful procedure, with the understanding that studies with long-term follow-up on lateral UKAs are currently lacking [112].

UKA revision is associated with significantly better clinical outcomes when the UKA was converted to a TKA rather than another UKA at a 10-year follow-up [37]. These findings are consistent with what has also been reported by other authors [53, 97]. When a failed UKA is revised with another UKA, a simple exchange of bearing surfaces might not resolve the leading cause of failure, often represented by malalignment, OA progression, or gap imbalance. Therefore, a revision with TKA should always be considered [37, 53].

Conclusion

8.8% (2641 of 30,140) of UKAs were revised at a mean time of 6.5 ± 2.6 years.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12891-024-08112-7.

Supplementary Material 1.

Acknowledgements
None.

Registration and protocol
The present review was not registered.

Authors' contribution
FM: conception, writing; LS: literature search, data extraction; RV: supervision, revision; DK: visualisation; AB: visualisation; FC: literature search, data extraction; JE: revision, supervision; JK: writing, revision; FB: writing; AV: revision. All authors have agreed to the final version to be published and agree to be accountable for all aspects of the work.

Funding
The authors received no financial support for the research, authorship, and/or publication of this article.

Data availability
The datasets generated during and/or analysed during the current study are available throughout the manuscript.

Declarations

Ethics approval and consent to participate
This study complies with ethical standards.

Consent to publication
Not applicable.

Competing interests
The authors declare no competing interests.

Received: 11 May 2023 Accepted: 25 November 2024
Published online: 02 December 2024

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