UNICOMPARTIMENTAL ARTHRITIS
Results of UKA
Review of the literature

CCOS Group

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MERISCIENCE

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Analysis of the results in the literature

In the « perfect » indications

- Single compartment disease
- Correctible deformity
- Stable ligaments
- No major stiffness
- Symptoms severity compatible w. replacment
- Patient eligible for surgery (general condition)

In the « stretched » indications

- Additional minor compartment desease
- ACL / PCL deficiency and laxity
- Age > 80 yo / <55yo
- Overweight

UKA is a technical demanding procedure
Keypoint to expect good results

INDICATION , TECHNIQUE & ORIENTATION, TIME after IMPLANTATION

Planing

TIBIAL CUT (+++) joint line level and "correction"

Distal femoral cut

Posterior femoral cut , Size

TRIALS

Definitive fixation

Avoid Contraindications

- Inflammatory joint deseases
- Evoluted Knee arthritis with bi/tri compartimental arthritis
- Big (osseous) diformity espacially espacially if fixed
- knee bone flexum > 10°

- All the others ares considered as « relative » contraindications

What can we expect from UKA ?

Many papers showing good and convergent results in medial & lateral UKA

Good satisfaction of the patients with no big influence of the prosthesis design itself

10-year-survivorship is between 70 % (Lidgren 2002) and 98 % (Berger 1999, Murray 1998)

What can we expect from UKA ?

Orthopaedics & Traumatology Surgery & Research

Clinical and technical factors influencing outcomes of unicompartmental knee arthroplasty: Retrospective multicentre study of 944 knees☆

A. Sébilo[a,*], C. Casin[b], B. Lebel[c], J.-L. Rouvillain[d], S. Chapuis[e], P. Bonnevialle[e], the members of the Société d'Orthopédie et de Traumatologie de l'Ouest (SOO)[f]

- 720 cases mean FU 62 months
- Increas of IKS knee score is **30 POINTS**
- IKS improve by 23,6 in men & 17,3 points in women
- **IKS knee score** preop **60** +/-14 to **90** +/-11 post op
- **IKS function score** preop **60** +/-19 to **82** +/-17 post op

Table 3 Postoperative clinical outcomes in men and women.

	354 men	590 women	*P* value
Satisfaction	83	86	0.12
Postoperative IKS function score	82	82	0.69
Postoperative IKS knee score	89	91	0.22
Forgotten knee (%)	13	25	0.30
IKS function score gain	17.3	23.6	0.007
IKS knee score gain	28	31	0.08

N = 944 UKA, retrospective multicentrique study

What can we expect from UKA ?

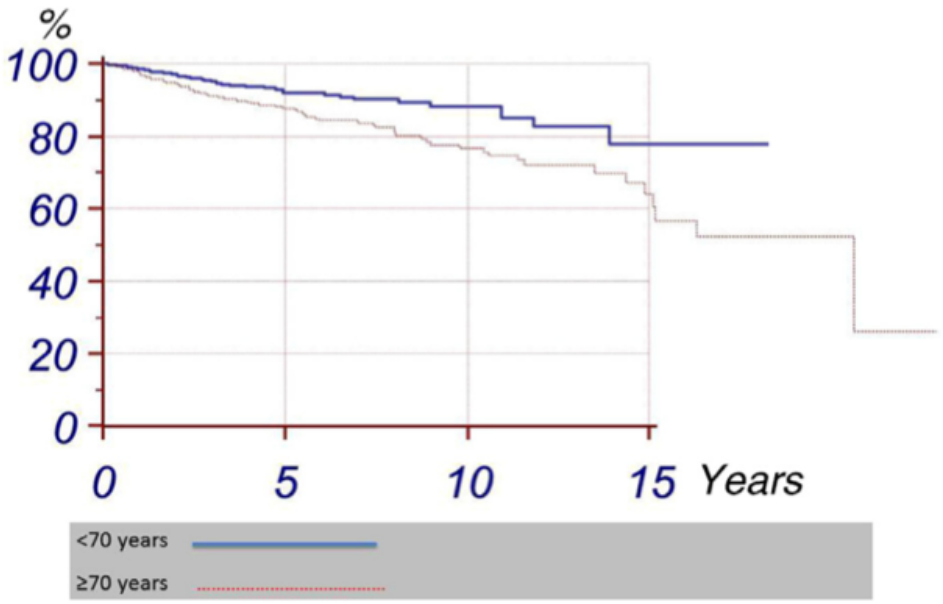

Figure 3 Survival curves in two age groups, < 70 years and ≥ 70 years.

Clinical and technical factors influencing outcomes of unicompartmental knee arthroplasty: Retrospective multicentre study of 944 knees☆

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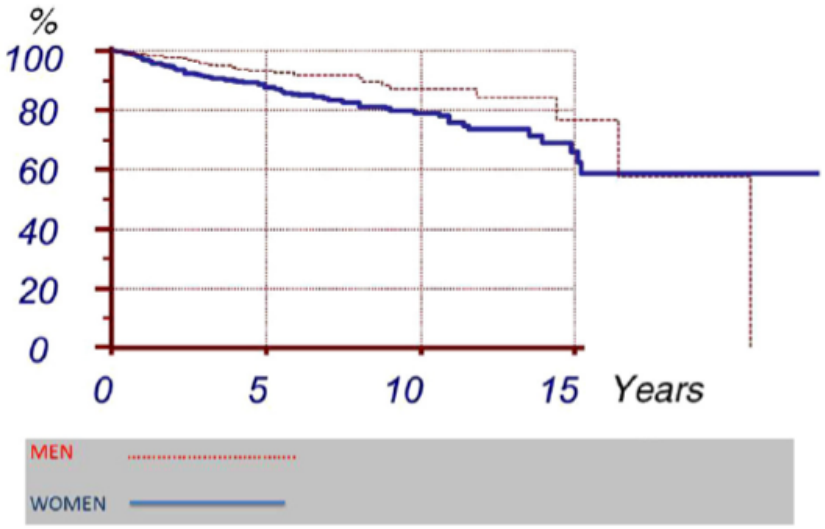


UKA : mobile or fixed ?

- **Polyethylene WEAR :** 0,7 mm v. 1,5 mm @ 10 years
  - 0.07 MM / year (mobile)
  - 0,15 MM : year (fixed St George Sled-2004
- Lower interface stresses = **less loosening** not shown by clinical studies
- **More technical forgiving :** result of congruency
- **Less tibial resection due to minimum polyethylene thickness**
  - Mobile = 3 mm
  - Fixed = 6 mm

M Rickman

UKA : mobile or fixed ?

Functional outcomes in the literature : identical

Metanalysis by Smith (2009)

12,7 % revision rate at 10 years – MOBILE bearing

11,6 % revision rate at 10 years – FIXED bearing

Registry data favours fixed bearings

Potential ***Dislocation Risk*** with mobile bearings

M Rickman

Tibial implant fixation

Mobile bearing cimentless
Full cimented PE
Cimented mobile bearing

Gleeson & Al : J Arthroplasty 2004
- Full PE
- Less complication , less pain

Lustig & Al : Traumato surg research 2009
- Excellent results @ 10 years
- 95,6% survival rate

Seeger & AL : Arthroscopy 2012:
- Cadaveric study on porotique bone
- More fracture with cementless

Ranawat @ Al : JBJS Br 2012
- TKR : Level 3 & 4 : no difference
- TKR : level 1 & 2 : cemented is better

Tibial implant fixation

SFHG 2013 Philippe CARTIER…

2 « reasonnable » choices :

- Mobile Bearings cimentless
- Full cimented PE in Fixed Bearings

But …

UKA : mode of failure

Unicompartmental knee arthroplasty modes of failure: Wear is not the main reason for failure: A multicentre study of 418 failed knees

J.-A. Epinette[a,*], B. Brunschweiler[b], P. Mertl[b], D. Mole[c], A. Cazenave[d], The French Society for the Hip and Knee[1]

Collected in 25 centres over a 31-year period

Isolated aseptic LOOSENING
Tibia (25%) T+F (15%)

OA progression to the medial Compartment
14%

Radiological wear of PE insert
7%

Clinical wear
With Metallosis
6,5 %

Technical faulty
Implantation technique
6,5 %

UKA : mode of failure

Table 4 Comparison of reasons of failure in the Swedish registry, Australian registry, and present study, in the overall populations.

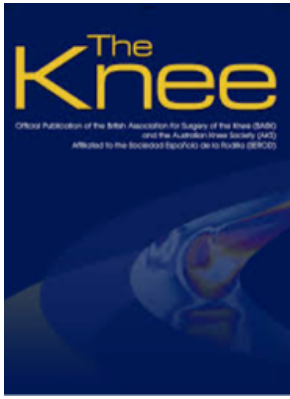
Overall population (%)	Swedish registry $n = 1576$	Australian registry $n = 2882$	Present study $n = 418$
Loosening	37.3	48.3	44.0
Disease progression	27.4	21.2	15.1
Wear	13.5	1.7	12.7
Technical problems	–	3.8	11.5
Pain	4.8	11.5	5.5
Fractures	2.0	2.7	3.6
Infection	2.3	4.6	1.9
Other	12.7	6.2	5.7
Total (%)	100	100	100

The study provided valuable information on **time to failure** in UKAs, which was surprisingly short in some cases. Early failure can be caused by defective material or faulty surgical technique

TECHNIQUE is of IMPORTANCE

Epinette - 2012

UKA in lateral OA



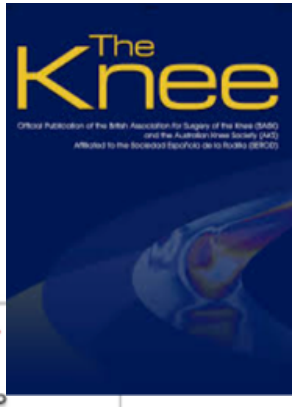
Progression of medial osteoarthritis and long term results of lateral unicompartmental arthroplasty: 10 to 18 year follow-up of 54 consecutive implants

Sébastien Lustig[a,*], Timothy Lording[a,b], Florent Frank[a], Caroline Debette[a], Elvire Servien[a], Philippe Neyret[a]

The survivorship in our patient population is **similar to previously published** long-term series, and is comparable to the **results reported for medial UKA**. In particular, we have not found young age to be a contraindication to this procedure.

Progression of medial disease is the most significant factor leading to reoperation.

UKA in lateral OA



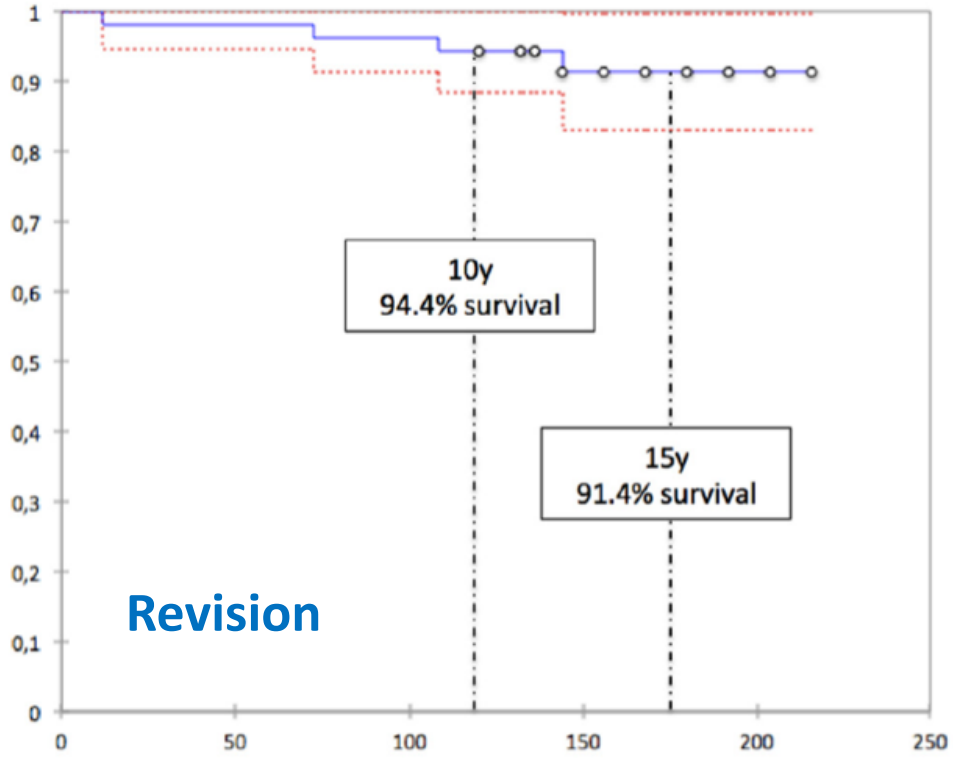


Fig. 3. Kaplan-Meier survivorship curve (failure: UKA revision).

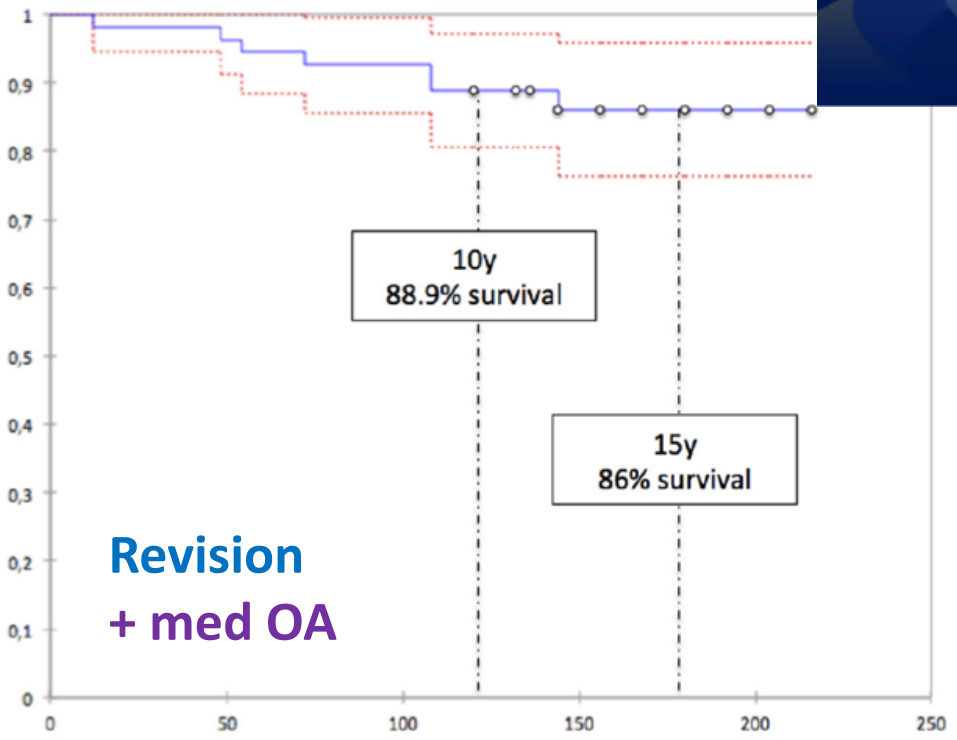


Fig. 4. Kaplan-Meier survivorship curve (failure: UKA revision or degenerative changes in the opposite compartment).

S. Lustig 2014

Return to sport after UKA ?

Am J Sports Med. 2007 Oct;35(10):1688-95. Epub 2007 Jun 8.

Return to sports and recreational activity after unicompartmental knee arthroplasty.

Naal FD[1], Fischer M, Preuss A, Goldhahn J, von Knoch F, Preiss S, Munzinger U, Drobny T.

- Recreational :activities : YES
- Sport : YES
- Same intensity / duration : NO
- MILD or MID impact sports

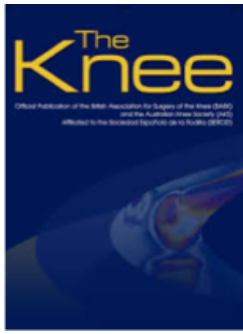
Extended Indications

Aged people with low demand

UKA :
- in ACL deficient knees
- Associated FP (minor) arthritis
- Global arthritis with predominant medial OA

82 YO
Flessum 10°
84 kg

YOUNG PATIENTS

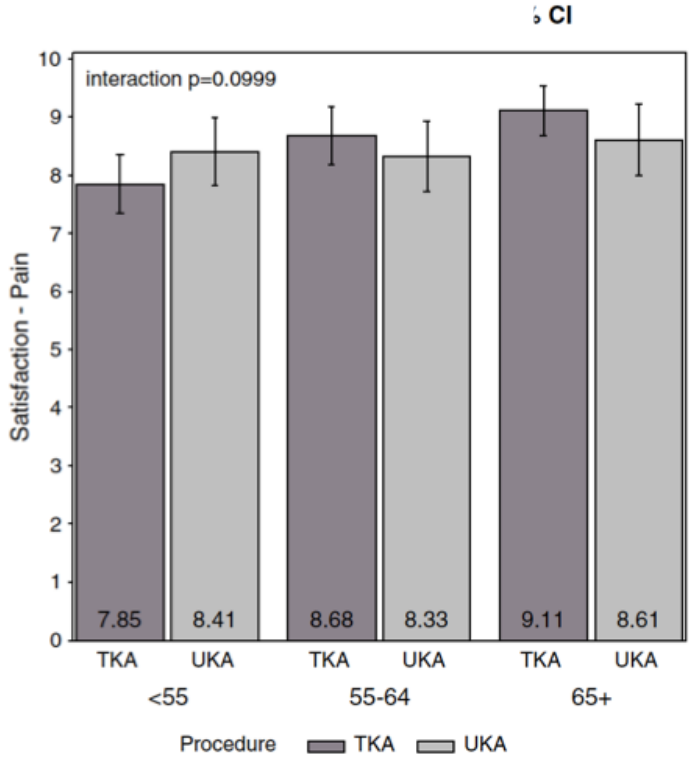


Patient satisfaction after primary total and unicompartmental knee arthroplasty: An age-dependent analysis

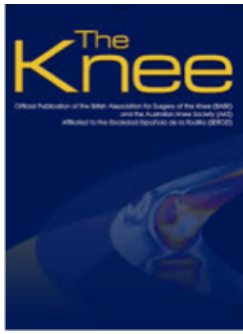
A Von Keudell *, S Sodha, J Collins, T Minas, W Fitz, AH Gomoll

Table 2
Patient satisfaction in patients with a TKA versus UKA given in numbers and percentages.

	UKA			TKA		
Age groups	Excellent/good	Fair/poor	Total	Excellent/good	Fair/poor	Total
<55	47	2	49	51	12	63
	96.0%	4.1%		81.0%	19.0%	
55–64	42	3	45	64	8	72
	93.3%	6.7%		89.0%	11.1%	
65 +	44	3	47	99	9	108
	93.6%	6.4%		91.7%	8.3%	
Total	133	8	141	214	29	243



YOUNG PATIENTS



Patient satisfaction after primary total and unicompartmental knee arthroplasty: An age-dependent analysis

A Von Keudell *, S Sodha, J Collins, T Minas, W Fitz, AH Gomoll

Patients w. UKA U55 : 96 % good/excellent

Patients w. TKR U55 : 81 % good/excellent results

Authors report high patient satisfaction with both procedures. Younger patients undergoing UKA had better satisfaction and a higher likelihood of having their expectations met than TKA patients of the same age group. The older the patient group was, the less significant the differences.

ELDERLY PATIENTS

J Arthroplasty. 2017 Jun;32(6):1792-1797. doi: 10.1016/j.arth.2017.01.020. Epub 2017 Jan 24.

Unicompartmental Knee Arthroplasty vs Total Knee Arthroplasty for Medial Compartment Arthritis in Patients Older Than 75 Years: Comparable Reoperation, Revision, and Complication Rates.

Siman H[1], Kamath AF[1], Carrillo N[1], Harmsen WS[1], Pagnano MW[1], Sierra RJ[1].

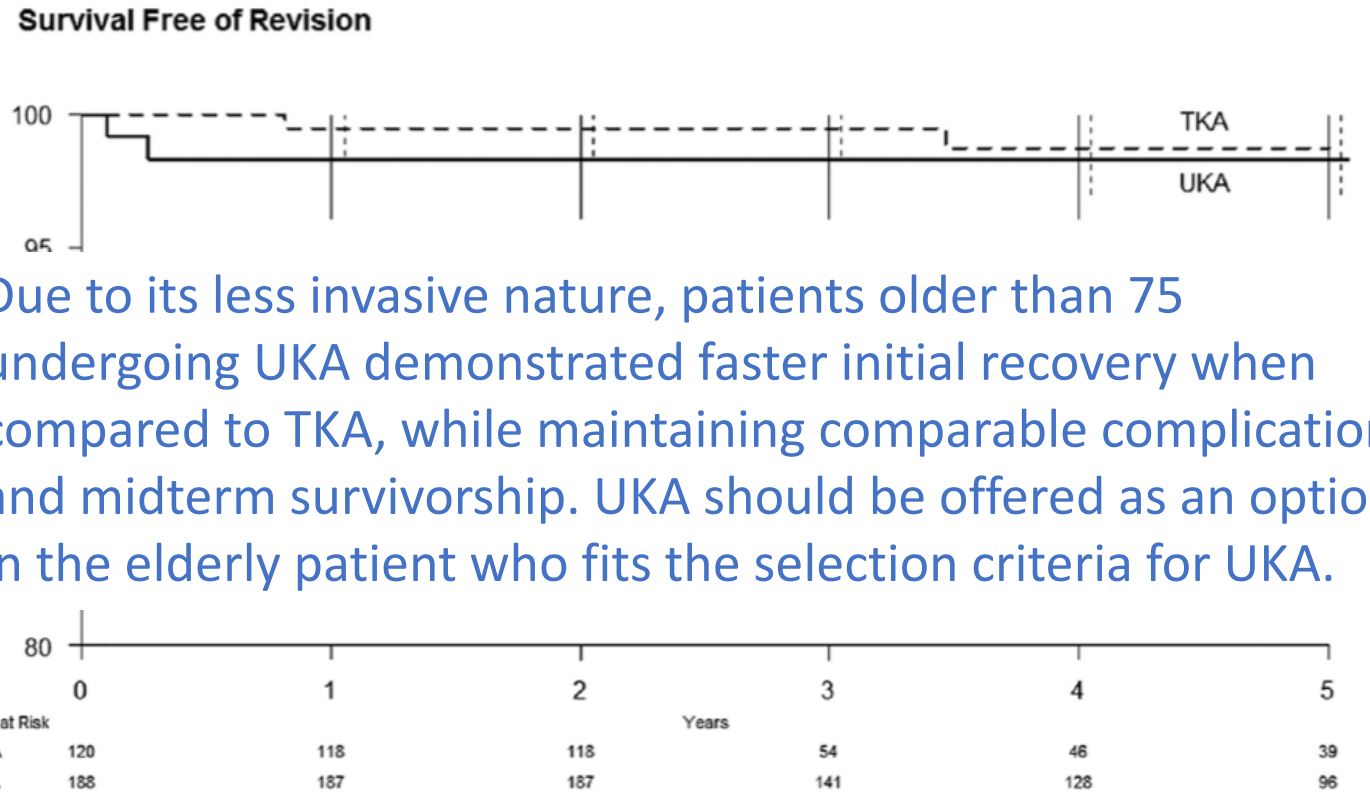
UKA (120) v. TKR (180

>75 ans

Medial OA

Survival

5 years survivorship



Due to its less invasive nature, patients older than 75 undergoing UKA demonstrated faster initial recovery when compared to TKA, while maintaining comparable complications and midterm survivorship. UKA should be offered as an option in the elderly patient who fits the selection criteria for UKA.

ELDERLY PATIENTS

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Unicompartmental Knee Arthroplasty in Octogenarians

Survival Longer Than the Patient

Alexander P. Sah, MD; Bryan D. Springer, MD*; and Richard D. Scott, MD†*

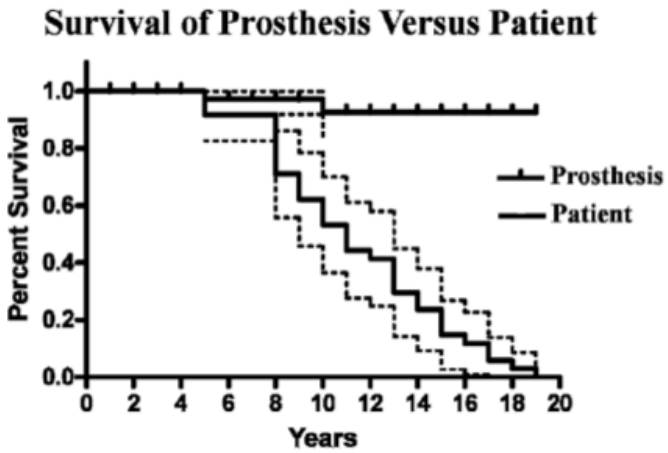
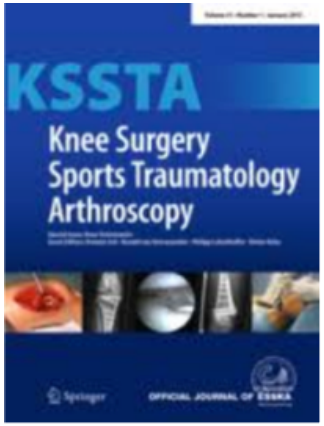


Fig 2. A Kaplan–Meier survival analysis shows the unicompartmental knee prosthesis versus patient survival in the octogenarian population. Ninety-five percent confidence levels are included in the survival curves. Log-rank testing showed a difference ($p < 0.0001$) between the two survival curves, with UKA prostheses surviving longer than the patients.

Knee arthroplasty should be considered a reasonable treatment for OA in octogenarians, as they are expected to live an additional 10 years postoperatively.
TKA remains the standard treatment for octogenarians with OA, UKA should be considered a viable alternative in the properly selected patient. **7.5% of octogenarians** having TKAs were suitable candidates for UKAs.

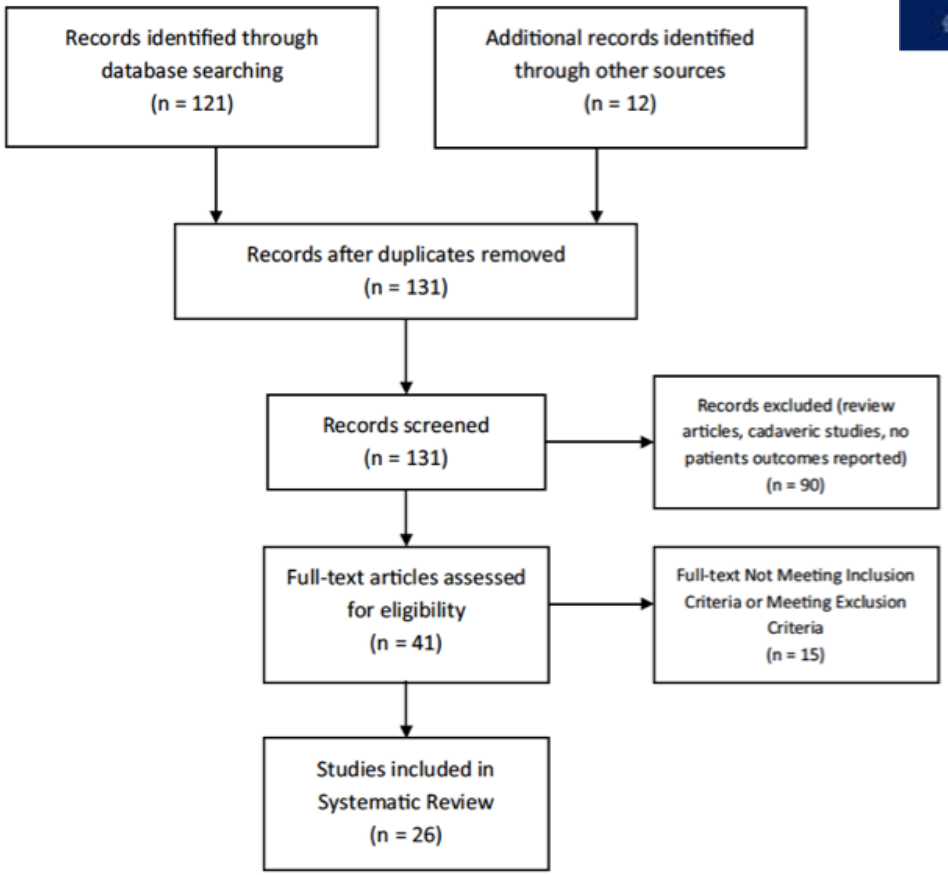
Elderly patients subjected to same selection criteria for UKAs as the general population tolerated the procedure with minimal complications,achieved short-term clinical improvements, were satisfied with the results

UKA in ACL deficient knee



Clinical outcome after UKA and HTO in ACL deficiency: a systematic review

Francesco Mancuso · Thomas W. Hamilton · Vijay Kumar · David W. Murray · Hemant Pandit



Level 4

HTO

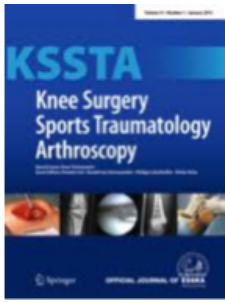
HTO + ACL rec

UKA

UKA + ACL

Mobile / fixed UKA

UKA in ACL deficient knee



Year	Authors	1	2	3	4	5	6	7	8	9	10	11	12	TOT
	Case series													
2011	Hui et al.	2	2											
2013	Zaffagnini et al.	2	2											
2011	Demange et al.	1	1											
2010	Akamatsu et al.	2	0											
2004	Bonin et al.	2	2											
2002	Agneskirchner et al.	1	2											
2000	Noyes et al.	2	2											
1995	Boss et al.	0	2											
1994	Dejour et al.	1	2											
1993	Lerat et al.	2	1											
1993	Neuschwander et al.	1	0											
1992	O'Neill et al.	0	1											
1987	Giger et al.	0	1											
2014	Engh et al.	2	2											
2013	Boissonneault et al.	2	2											
1988	Goodfellow et al.	0	2											
2004	Hernigou et al.	2	2											
2012	Tinius et al.	2	2	2	2	0	1	2	0	–	–	–	–	11/16
2012	Westons-Simmons et al.													
2011	Terzaghi et al.													
2009	Krishnan et al.													
2007	Dervin et al.													
2003	Williams et al.													
2002	Badhe et al.													
1996	Lattermann et al.													
1993	Noyes et al.													

Table 4 Survival rate data for fixed versus mobile bearing in UKA groups

Group	Patients followed	Mean follow-up month (range)	Male (%)	Fu avg mo (range)	Survival rate (%)	Failures/100 observed years (95 % CI)	Revisions/100 observed years (95 % CI)
Fixed							
ACL deficiency	80	66 (39–91)	51.7	102	85	1.77 (±)	1.77 (±)
ACL reconstruction	45	48 (38–64)	40.7	38	~~100~~	0	0
Total	125	60 (38–91)	48.3	79 (9–264)	90.4	1.46 (± 0.16)	1.46 (± 0.16)
Mobile							
ACL deficiency	74	67 (54–77)	76.2	50	90.5	2.26 (±)	2.26 (±)
ACL reconstruction	61	51 (36–71)	73.8	54	~~95.1~~	1.17 (±)	1.17 (±)
Total	135	60 (36–77)	74.8	52 (12–120)	92.6 %	1.77 (± 0.53)	1.77 (± 0.53)

The most important finding of the present study is that the revision rate following both HTO and UKA is significantly lower when ACL reconstruction is performed

Limited conlusions for OPTIMAL treatment

UKA after HTO

Previous HTO :

- Hypocorrected: no problem. Pay attention to tibial SLOPE
- Hypercorrection : much more complicated to correct. **CAUTION**

Removal of HTO hardw. In a separated procedure

UKA and alignment / correction of deformity

N= 58 patient
Ac FU = 15 yeass

Clin Orthop Relat Res. 2004 Jun;(423):161-5.

Alignment influences wear in the knee after medial unicompartmental arthroplasty.

Hernigou P[1], Deschamps G.

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Failure UKA :

- WEAR of the cartilage in the opposite compartment
- WEAR in the polyethylene tibial implant

BALANCE between both

Limb alignment influences both of these 2 factors in the long term

- overcorrection in valgus of the preoperative deformity (HKA > 180°) associated with an increased risk of **degenerative changes in the opposite compartment**.
- Severe undercorrection in varus of the deformity (HKA < 170°) was associated with increased wear in the tibial component and recurrence of the deformity which was indicative of polyethylene wear.

For medial implants that were implanted in moderate varus (hip-knee-ankle angle of 171 degrees to 179 degrees) the rate of wear of the polyethylene was less than in knees with severe undercorrection and the risk of degenerative changes in the opposite compartment was low.

UKA with FP arthritis

Clinical > radiological :

- Quadriceps trophycity
- PAIN on FP joint

- FP arthritis + pain = TKR
- FP slight arthtritis + few pain = could be a UKA

Conclusion

Peter VERDONK said : the probleme with this debate around the choice between HTA , UNI TKR … is that we discuss since years and we still don’t know what is the best option !

2nd conclusion : it was a great day for skiing in Val d’Isère !!!


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