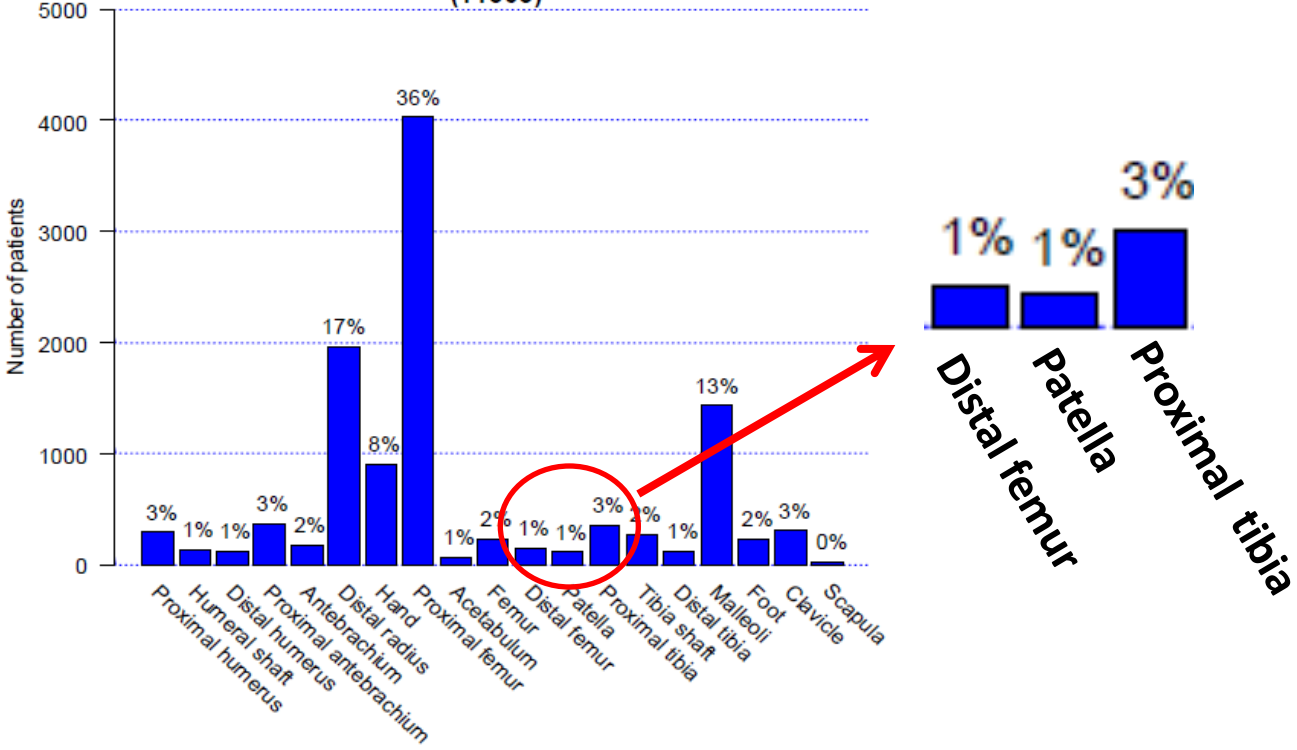

”Knee Arthroplasty as a First Procedure for Fracture Treatment”

Anders Troelsen, MD, Ph.D., Professor
Copenhagen, Denmark



Fractures of the knee – prevalence?

Anatomical distribution 2016
Primary procedure
Adult fractures
(11303)



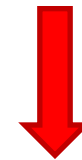
Danish Fracture Database, Annual Report, 2016

The need for TKR?

- **Danish Knee Arthroplasty Registry**
Annual report 2022: n=12.774
- Indication for TKR - after fracture in:
 - Proximal Tib.: 0,8 %
 - Patella: 0,2 %
 - Distal femur: 0,1 %

TKR in PTOA

(8.426 operated Tibial Plateau Fracture)



7,3 % at 10 years

(5,3 times the risk of the general pop. –
matched group of 33.698)

Wasserstein et al., JBJS Am., 2014

TKR in PTOA – Issues? Revisions

Acta Orthopaedica 2017; 88 (3): 263–268

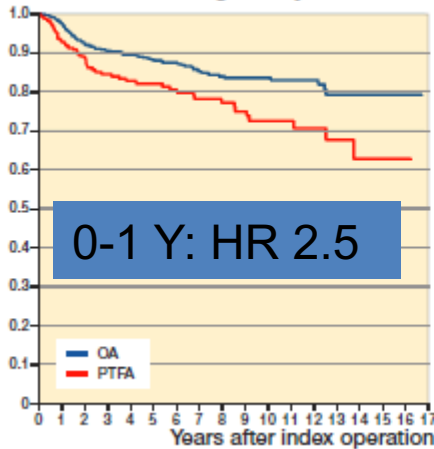
263

Increased risk of early and medium-term revision after post-fracture total knee arthroplasty

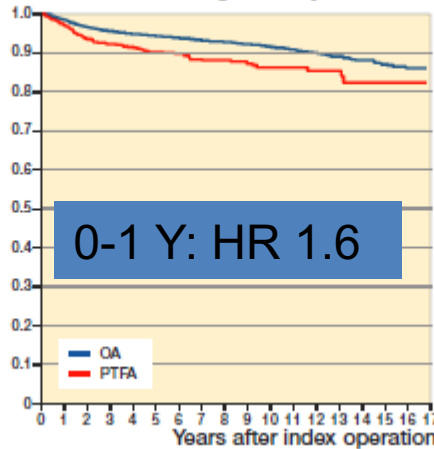
Results from the Danish Knee Arthroplasty Register

Anders EL-GALALY¹, Steffen HALDRUP², Alma Becic PEDERSEN³, Andreas KAPPEL¹,
Michael Ulrich JENSEN¹, and Poul Torben NIELSEN¹

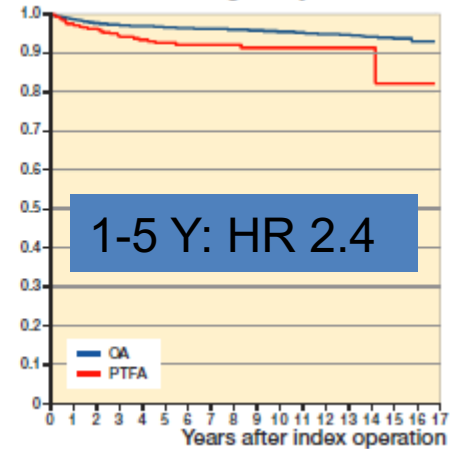
Survival estimate – age < 50 years



Survival estimate – age 50–70 years



Survival estimate – age >70 years



TKR in PTOA – Issues? Revisions

Acta Orthopaedica 2017; 88 (3): 263–268

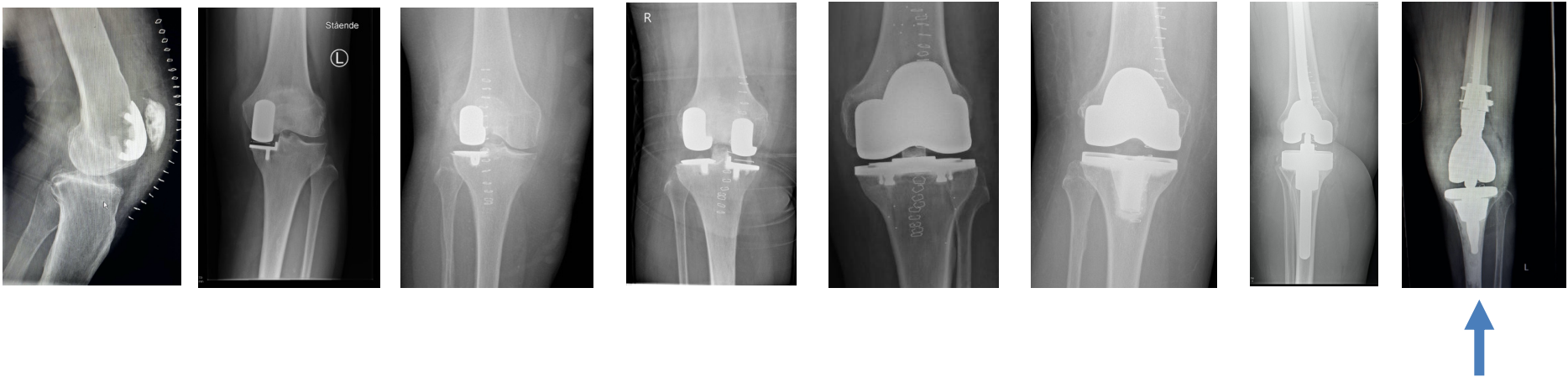
263

Increased risk of early and medium-term revision after post-fracture total knee arthroplasty

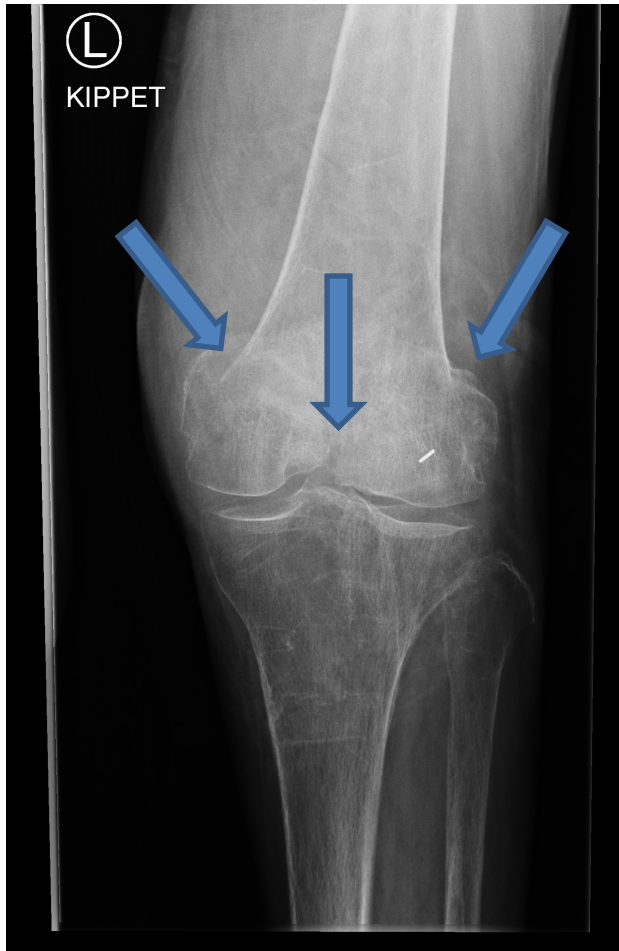
Results from the Danish Knee Arthroplasty Register

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- Indications for revision: 3-fold increase in incidence proportions for PTOA:
 - Infection (3.2 % vs 1.4 %)
 - Instability (3.5 % vs 1.1 %)
 - Aseptic loosening (3.2 % vs 1.0 %)



CASE #1







Indications for primary resection arthroplasty?

- Dist. Femur & Prox. Tibia

- Maintaining mobilization of the patient !
- How likely is the fracture to heal after ORIF ?
- Is the patient likely to mobilize after ORIF ?
- Contraindications to arthroplasty (soft tissues...)
- Other indications to do an arthroplasty ?





Principles of distal femoral resection:

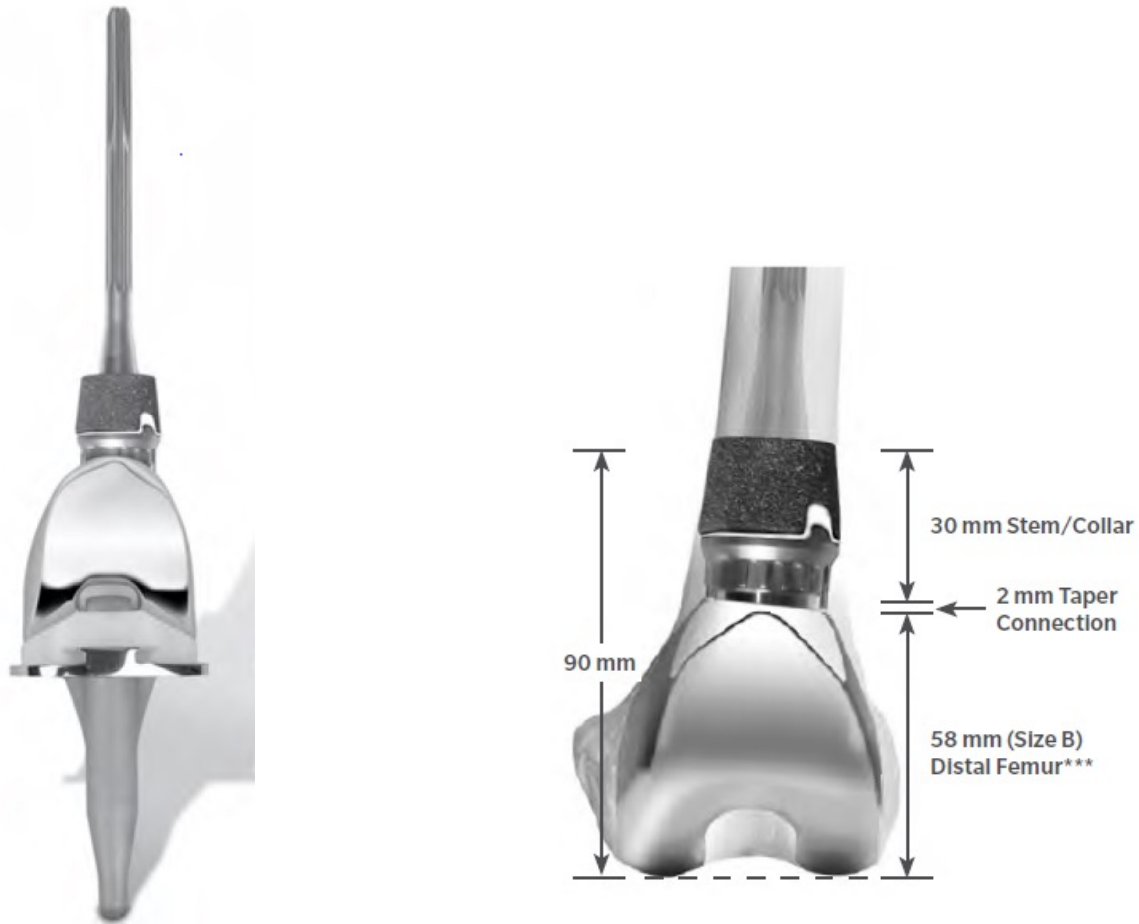
Establish femoral resection from joint-line.

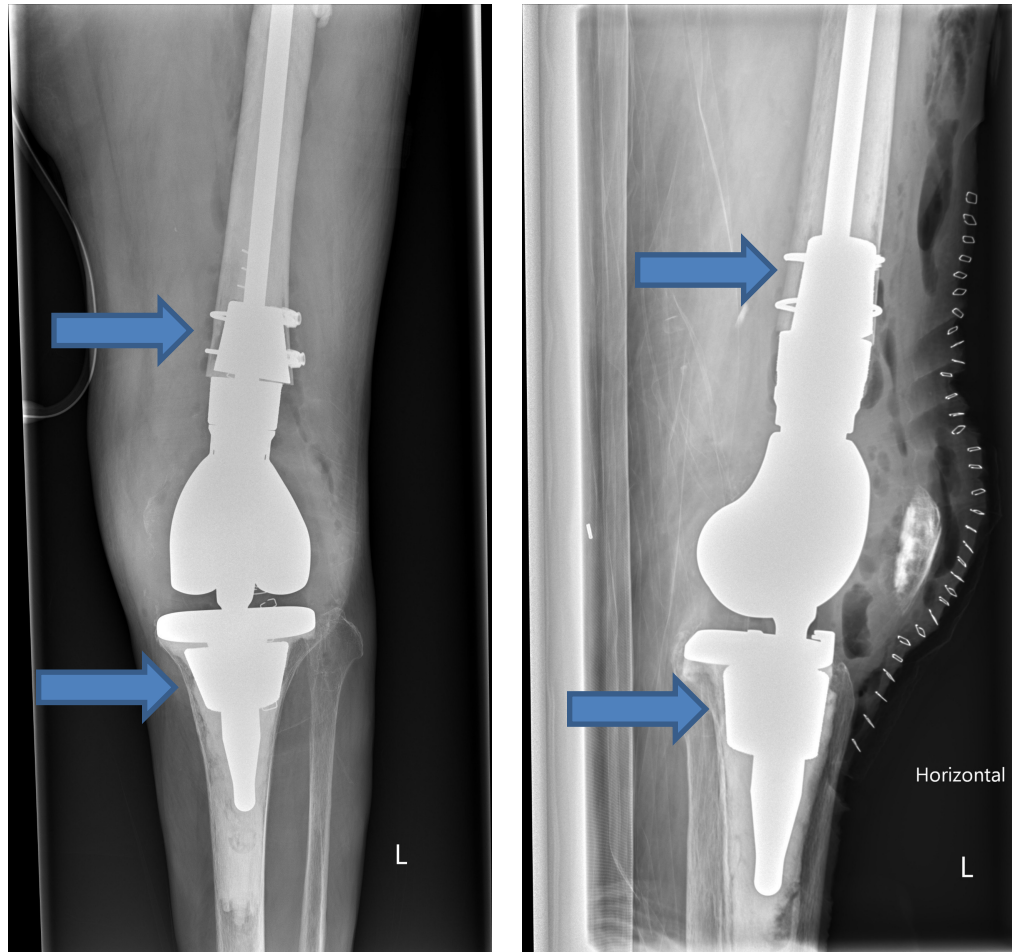
Make references for rotational positioning.

Special needs for bone support (osteoporotic bone).

Standard cut on tibia.

Leave optimal tension.

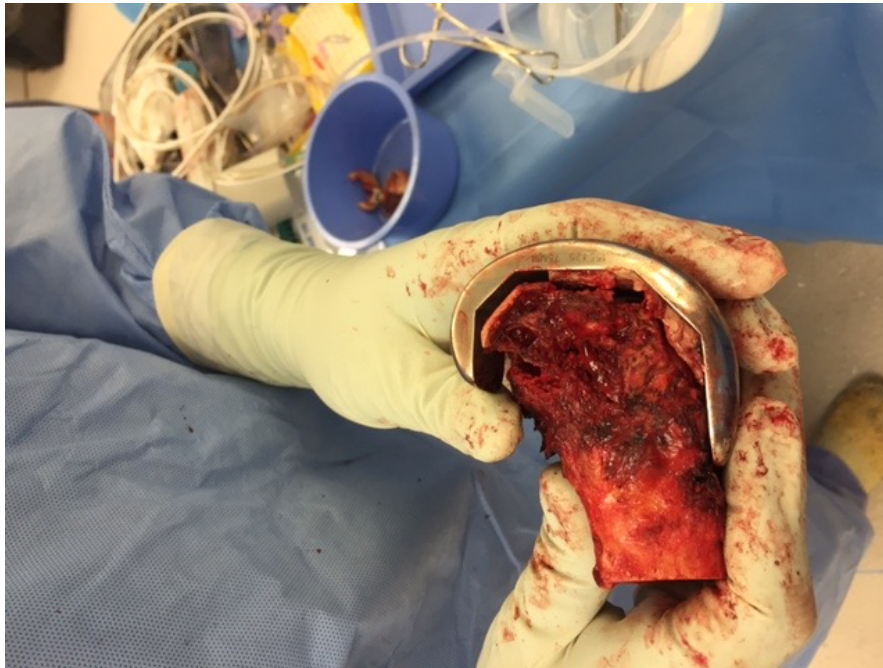






CASE #2





Study results



Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

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The use of knee mega-prosthesis for the management of distal femoral fractures: A systematic review

Meluzio MC^{a,b}, Oliva MS^{a,b}, Minutillo F^b, Ziranu A^b, Saccomanno MF^{b,*}, Maccauro G^{a,b}

^aUniversità Cattolica del Sacro Cuore, Roma, Italy

^bFondazione Policlinico Universitario A. Gemelli IRCSS, Roma, Italy

Table 1

The table shows literature analysis, studies level of evidence (LOE) and kind of fractures treated.

Authors	Year	LOE	Fracture Type
Madsen [21]	1989	IV	Periprosthetic
Berend [16]	1999	IV	Periprosthetic Supracondylar Non-union
J. Keenan [13]	2000	IV	Periprosthetic
Springer [15]	2001	IV	Periprosthetic Supracondylar
Springer [14]	2004	IV	Non-union of supracondylar fracture Non-union of periprosthetic fracture Non-union of supracondylar fracture Acute periprosthetic fracture
Pearse [4]	2005	IV	Supracondylar
Harrison [17]	2006	V	Periprosthetic
Vaishya [18]	2011	IV	Non-union of supracondylar femur fracture
Wakabayashi [9]	2011	IV	Supracondylar
Saidi [12]	2014	IV	Periprosthetic
Clayton C. Bettin [19]	2016	IV	Supracondylar
Hyung-Suk Choi [10]	2016	IV	Periprosthetic
Gan [11]	2018	IV	Periprosthetic

Study results



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Table 2

The table shows literature analysis; for each study mean age, kind of megaprosthesis, range of motion (ROM), functional outcomes and FU (follow-up) are reported.

Authors	Patients	Mean AGE	Megaprosthesis	ROM	Functional evaluation tool	Score	FU
Madsen (1989) [21]	4	61-78	LINK	0-100°	HSS Knee Rating Scale	78,25	3 y
Berend 1999) [16]	15	52-91	Orthopaedic Salvage System (OSSTM; Biomet)	0-106°	American Knee Society Score	87	2 y
J. Keenan (2000) [13]	7	69-87	PFC Johnson and Johnson	0-90°	Bristol Knee Score	75-89	1 y
Springer (2001) [15]	15	46-89	Kinematic Rotating Hinged (KRH) knee	5-125°	American Knee Society Score	77	-
Springer (2004) [14]	13	47-92	Modular Segmental Kinematic Rotating Hinge (Howmedica)	0-90°	American Knee Society Score	75	58 m
Pearse (2005) [4]	6	>75	Stanmore Knee replacement	60-100°	Oxford Knee Score	60-12	6 m
Harrison (2006) [17]	2	66-72	-	3-92°	American Knee Society Score	85	19 m
Vaishya (2011) [18]	8	68-85	Modular Resection System (Stryker, Howmedica)	3-102°	American Knee Society Score	84-92	4 y
Wakabayashi (2011) [9]	1	77	Kyocera limb salvage (KLS) tumor endoprosthesis.	0-135°	American Knee Society Score	95	2 y
Saidi (2014) [12]	7	70-90	Stryker GMRS System	80° flexion	American Knee Society Score	72-92	6 m
Clayton C. Bettin (2016) [19]	18	62-94	LPS Limb Preservation System Depuy	1-99°	American Knee Society Score	87,5	30 m
Hyung-Suk Choi (2016) [10]	1	70	Mutars IMPLANTCAST	0-95°	HSS Knee Rating Scale	86	2 y
Gan (2018) [11]	7	59-86	NCB Distal Femur System (Zimmer)	-	-	-	44 m

Study results

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Long-Term Results of Total Knee Arthroplasty with Contemporary Distal Femoral Replacement

Cody C. Wyles, MD, Meagan E. Tibbo, MD, Brandon J. Yuan, MD, Robert T. Trousdale, MD,
Daniel J. Berry, MD, and Matthew P. Abdel, MD

Investigation performed at the Mayo Clinic, Rochester, Minnesota

Methods: We identified 144 consecutive TKAs performed with DFR for non-oncologic indications from 2000 to 2015 at a single academic institution. Indications for the index DFR included 66 (46%) for native (n = 11) or periprosthetic (n = 55) femoral fracture, 40 (28%) for staged treatment of periprosthetic joint infection, 28 (19%) for aseptic TKA loosening, and 10 (7%) for other indications. Porous metal cones were used to augment femoral fixation in 28 patients (19%) and tibial fixation in 38 patients (26%). Outcomes included cumulative incidence of revision and reoperation (utilizing a competing

Study results

Results: The 10-year cumulative incidences of revision for aseptic loosening, all-cause revision, and any reoperation were 17.0%, 27.5%, and 46.3%, respectively. There was an increased risk of reoperation in patients who underwent index DFR for aseptic TKA loosening (hazard ratio [HR], 2.30; $p = 0.026$) or periprosthetic joint infection (HR, 2.18; $p = 0.022$) compared with periprosthetic or native femoral fractures. However, there was no difference in risk of revision for aseptic loosening or all-cause revision based on the original operative indication. The mean Knee Society score increased from 45 preoperatively to 71 at the time of the latest follow-up ($p < 0.001$). Radiographic loosening was observed in 8 unrevised DFRs (7%). There were 7 above-the-knee amputations performed at the time of the final follow-up, all for intractable periprosthetic joint infection.

TABLE II 5-Year Cumulative Incidence of Septic and Aseptic Revision by Original Operative Indication*

Indication for Revision	Indication for Index DFR		
	Fracture	Periprosthetic Joint Infection	Aseptic Loosening
Periprosthetic joint infection	1.5% (0.2%-10.6%)	9.5% (3.2%-28.0%)	3.9% (0.6%-26.3%)
Aseptic loosening	10.2% (4.7%-22.0%)	9.2% (3.1%-27.6%)	20.4% (7.9%-52.3%)
Other aseptic failure	0%	0%	3.7% (0.5%-25.3%)

*Values are given as the cumulative incidence, with the 95% CI in parentheses.