POSTER NUMBER – PO126

The Natural History of Radiolucencies following Uncemented TKR at 9 Years

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INTRODUCTION

Aseptic loosening of cemented TKA remains a common cause of failure, particularly in younger and obese patients. Recent interest in cementless TKA has increased due to the theoretical advantages of preserving bone stock with lasting, biological implant fixation. One concern with cementless TKA are the presence of post-operative radiolucent lines (RLL) at the bone-implant interface. We report on the 9-year history of RLL and functional outcome scores in a group of patients treated with a cruciate-retaining, rotating platform uncemented TKA design

METHODS

Retrospective single surgeon case series - 21 patients (26 knees) were treated with a CR fully porous coated femur, fully porous mobile bearing rotating platform tibia and a cemented patella. At final follow-up, 17 patients (22 knees) were available for review. Average time for final follow-up was 9.6 years, average age was 59.1 and average BMI was 34.1. Evaluations were done preoperatively, at 6 week, 1 year follow-up and at final follow-up. The patients had the same X-ray protocol (standing AP, lateral and sunrise) taken at all visits. final follow up. RLL were measured using the Knee Society scoring (KSS) system and read by two experienced surgeons.[4] The clinical KSS were collected at preop, one year and final follow-up

RESULTS

Parameter	Median preoperative value (range)	Median 1 year (range)	Median final follow-up (range)
Knee Society Score			
Pain	(Moderate – Severe)	(Mild – Occasional)	(None- Occasional)
Function	63.8 (45-80)	93.7 (60-100)	94.1 (60-100)
Total	37 (22-59)	95.1 (31-100)	97.3 (84-100)
Alignment	3.7 (10 VARUS-5VALGUS)	4.6 (0 VARUS - 5 VALGUS)	4.6 (0 VARUS - 5 VALGUS)
Extension	8.5 (0-15)	.5 (0-5)	0 (0-0)
Flexion	124.2 (120-135)	123.7 (85-130)	128.3 (120-140)

Table 1: Mean preoperative and postoperative Knee Society Scores

	6 weeks	1 year	Final
Any Radiolucency	21/21 (100%)	21/21 (100%)	9/21 tibiae 17/21 femora
. To 1mm	15/21 tibiae 11/21 femora	9/21 tibiae 10/21 femora	8/21 tibiae 17/21 femora
. To 2mm	2/21 tibiae 2/21 femora	2/21 tibiae 1/21 femora	1/21 tibiae 0/21 femora
. ≥ 2mm	0/21 tibiae 0/21 femora	0/21 tibiae 0/21 femora	0/21

Table 2: RLL evaluation

6-weeks - RLL in all patients on both the tibia and femur, Tibial Tray (zones 1 and 4), Femoral champfer (zones 2 and 3)

1 year - 4 femurs / 4 tibias with new RLL (<2m) in similar zones, Previous RLLs from 6 weeks remained

Final - No new / progressive tibial or femur RLLs

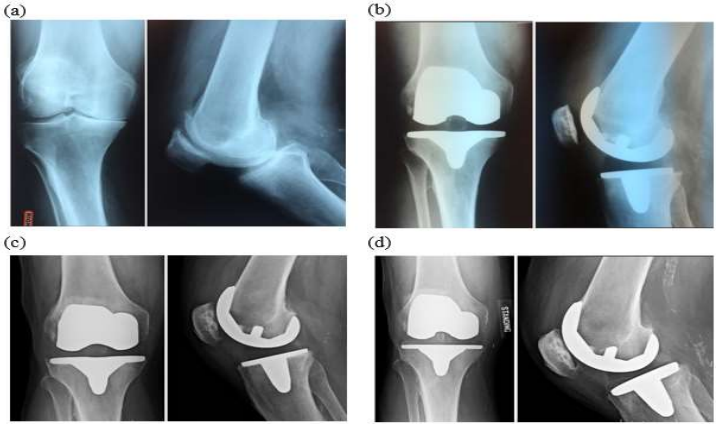

Figure 1: (a) XR of a 68-year old patient at pre-op (b) 6-week postop right TKA using cementless tibial baseplate and femoral component with cemented patella component with RLL at femoral zones 2,5, and 3 (c) 1-year postoperative with continued non-progressive RLL at zones 2,5, and 3 and new RLL at tibial zone 1 (d) Final follow up (10 years) with continued non-progressive RLL at zones 2,5, and 3 and tibial zone 1

CONCLUSION

A primary cementless, posterior CR rotating platform TKA system resulted in femoral and/or tibial RLLs at all time points with an average final follow-up of 9.6 years. These RLLs were found to be small (<2mm), incomplete and non-progressive in all cases. KSS at final follow-up averaged 97.3 and no cases required any revision surgery. Study limitations include inherent biases of retrospective review, a small sample size and the use of a single prosthesis design. The present study shows that although RLLs are common following uncemented TKA, there was no progression of these lines and no correlation with knee society functional scores at long term follow-up