Factors influencing post-operative kneeling ability following total knee arthroplasty.

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Introduction

Kneeling remains one of the poorest Patient Reported Outcome Measures (PROMs) following total knee arthroplasty (TKA). To optimise this outcome; a better understanding is required of factors associated with kneeling difficulty. Here we aim to investigate whether pre-operative knee range of movement (ROM) impacts kneeling ability following TKA. Secondly, we also investigate the impact of patellar resurfacing on kneeling ability post-TKA.

Aims

- Primary aim: To determine whether pre-operative ROM is associated with post-operative kneeling ability following primary total knee arthroplasty.
- Secondary aim: To determine whether patellar resurfacing impacts kneeling ability following primary total knee arthroplasty.

Methods

A retrospective analysis was undertaken of 520 primary TKA procedures from May 2006 to December 2009 with the Medial Rotation Knee system at three UK centres. Patients were seen pre-operatively where demographic data such as age, gender and Body Mass Index (BMI) along with bilateral knee ROM was recorded. Patient reported outcomes were collected at 6 months, 3 years, 5 years, 7 years and 10 years post-operatively using the Oxford Knee Score (OKS).The primary outcome; post-operative kneeling ability was assessed using question seven of the OKS. An ordinal logistic regression model was designed to investigate whether pre-operative ROM impacted kneeling ability. Spearman correlation coefficients were used to assess the strength and significance of association between patellar resurfacing and kneeling ability.

Results

- Pre-operative knee flexion in the contralateral rather than the operated knee was significantly positively associated with post-operative kneeling ability ($p<0.05$)(Table 1).
- Patellar resurfacing status had a small and statistically insignificantly association with post-operative kneeling ability.
- Age and Body Mass Index (BMI) were negatively associated with patient reported kneeling ability ($p<0.001$).
- Males reported significantly higher kneeling scores ($p<0.001$) and overall OKS scores ($p<0.01$).
- Kneeling difficulty remained highly prevalent in the cohort both in the short as well as longer term following TKA.

	OKS Q7 Kneeling score (coef. And 95% CI)	Overall OKS (coef. And 95% CI)
Age at operation	**-0.054***** [-0.085,-0.024]	**-0.108*** [-0.207,-0.008]
Male (female=ref)	**1.938***** [1.418,2.458]	**2.815**** [1.119,4.511]
Body mass index (BMI)	**-0.101***** [-0.152,-0.050]	**-0.202*** [-0.368,-0.037]
Operated knee flexion(°)	0.001 [-0.012,0.014]	0.013 [-0.030,0.055]
Contralateral knee flexion(°)	**0.011*** [0.002,0.020]	0.026 [-0.004,0.055]
Temporal effects (reference: 6 months)		
Follow up 3 Year	0.226 [-0.061,0.513]	**1.884***** [1.156,2.611]
Follow up 5 Year	-0.172 [-0.474,0.130]	**1.409***** [0.650,2.168]
Follow up 7 Year	-0.142 [-0.465,0.181]	**1.012*** [0.197,1.827]
Follow up 10 Year	**-0.564**** [-0.915,-0.213]	0.567 [-0.292,1.425]

Table 1. Modelling results for patient reported kneeling ability (OKS Q7) and overall OKS score.
(OKS = Oxford Knee Score, OKS Q7= Oxford Knee Score question number seven, CI= Confidence interval). Ordered logit model used for OKS Q7 and linear regression model used for OKS. 95% confidence intervals in brackets. $p< 0.05$, ** $p< 0.01$, *** $p< 0.001$*

Conclusions

- Pre-operative ROM particularly of the contralateral knee along with demographic factors such as age, gender and BMI can be used in conjunction to predict the cohort of patients at higher risk of poor kneeling PROMS following TKA.
- This can facilitate appropriate pre-operative counselling and expectation setting as well as targeted postoperative rehabilitation planning for patients wishing to improve their chances of kneeling following TKA.
- Patellar resurfacing does not impact kneeling ability following TKA and hence patient' wishes to kneel post-operatively should not be a major factor when deciding between patellar resurfacing or retention during TKA.