Routine Patellar Resurfacing During Total Knee Arthroplasty is not Cost-Effective in Patients without Patellar Arthritis

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Introduction

- During total knee arthroplasty (TKA), whether or not one should routinely resurface the patella is controversial.
- Leaving an unresurfaced patella following index TKA may lead to anterior knee pain (AKP), patellofemoral crepitus, and future secondary resurfacing operations.
- However, routinely resurfacing the patella (PR) may lead to patellar fracture, aseptic loosening, patellar instability, avascular necrosis, and patellar clunk.
- The purpose of the present study is to utilize the existing level one evidence to assess the cost-utility of routine patella resurfacing during primary TKA.
- Hypothesis: Selective resurfacing of the patella is more cost effective than routine patellar resurfacing during primary TKA.

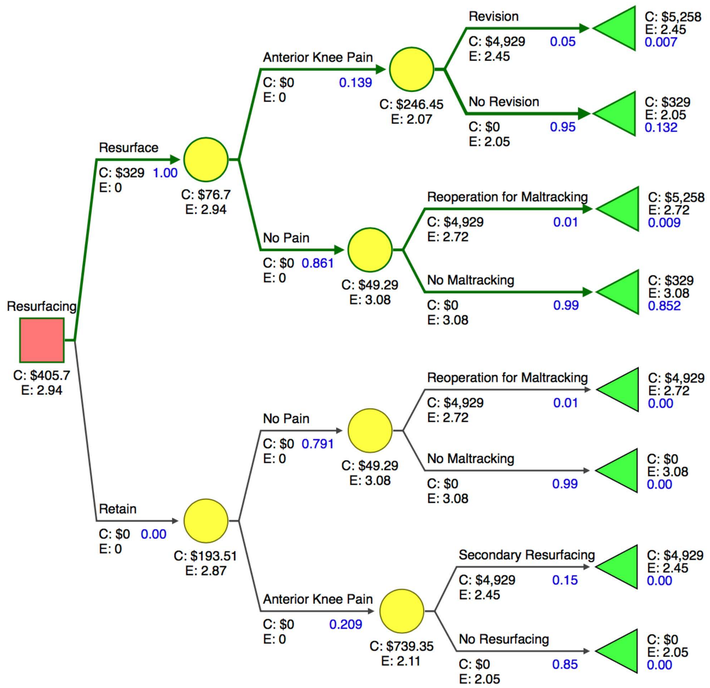
Methods

Systematic Review → Preoperative Data: Year, Exclusion Criterion, length and proportion of follow-up, criteria to perform PR, preoperative functional scores

Postoperative Data: Functional scores, rate of AKP, delayed patellar resurfacing, reoperation for maltracking, and revision for patella-related complications → Decision Tree Analysis

- The potential outcome events that may be associated with a decision to resurface the patella during TKA were defined (See Figure 1: Sample of Decision Tree for each analysis)
- Two analyses were performed: 1) Included all studies that qualified per the systematic review; 2) Used probabilities based upon those studies in which randomization was performed among patients without evidence of patellar arthritis (selective PR)
- Quality adjusted life year scores (QALY)[1] spanning 5 years were calculated based on literature-based cost estimates

Methods (continued)



Results

- 14 prospective randomized controlled studies were included combining 3,562 patients undergoing 3,823 TKAs
- Combining all studies: persistent AKP postop found in 20.9% unresurfaced vs 13.2% of resurfaced patellae ($p<0.001$)
- Reoperation for patellar pathology occurred in 3.7% of unresurfaced versus 1.6% resurfaced patellae ($p<0.001$)
- However, when analyzing only studies that excluded arthritic patellae, post op AKP was equivalent between unresurfaced vs resurfaced groups ($p=0.97$)
- Across all studies, routine PR showed improved utility scores for the five-year post-arthroplasty period (2.94 versus 2.87)
- In considering routine resurfacing in patients without arthritis, the utility output was 3.06 and only 0.0013 points improved over the patella retention.
- At a cost of $329 (PR) vs $90.34 (retention), the incremental cost per QALY achieved increased to $183,584

Discussion

- Decision of whether or not to resurface the patella during primary TKA remains controversial
- The pooled data of this analysis agrees with literature that routine PR is cost effective.[2]
- Two separate level-one studies have demonstrated no difference in the incidence of AKP or need for secondary surgery in patients without significant patellar cartilage wear.[3,4]
- From our pooled results, incremental cost per QALY for PR was $3,032- a reasonable cost. However, when considering routine PR in patients without significant patellar wear, the cost per QALY dramatically increased to $183,584– outside of the accepted norm.
- One study investigating selective PR found only 34.4% of patients met their criteria of Outerbridge Grade IV arthritis.[5]
- Adopting these findings here, we show that the cost avoidance in the USA if patellae are not resurfaced in 66% of TKA recipients without patellar arthritis could be 108,559,370 annually
- Limitations: importance of accurate utility scores, variation in costs, and limited study duration to 5 years

Conclusion

- This cost effectiveness analysis shows that it is not cost effective to routinely resurface the non-arthritic patella during primary TKA
- We show that selective PR may provide a more effective means of maxing benefits and minimizing the risk of complications

References

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