

Posterior Stabilized Versus Cruciate-Substituting Total Knee Arthroplasty: Midterm Results

David F. Scott, MD

Adult Reconstruction

Spokane Joint Replacement Center, Spokane, WA

Clinical Instructor

University of Washington Orthopedics and Sports
Medicine



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Introduction

- There is limited consensus whether a non-post/cam cruciate-substituting (CS) device is an acceptable alternative to the PS device in primary knee arthroplasty
- The PS knee has certainly been extremely successful, advancing the state of the art, and providing excellent 20-30 yr outcomes

Introduction

- However, PCL-substituting devices have been in use with excellent shorter term results
- Possible advantages:
 - Simplified surgical technique with fewer steps
 - Preservation of bone w/o box cut
 - Elimination of poly wear of post

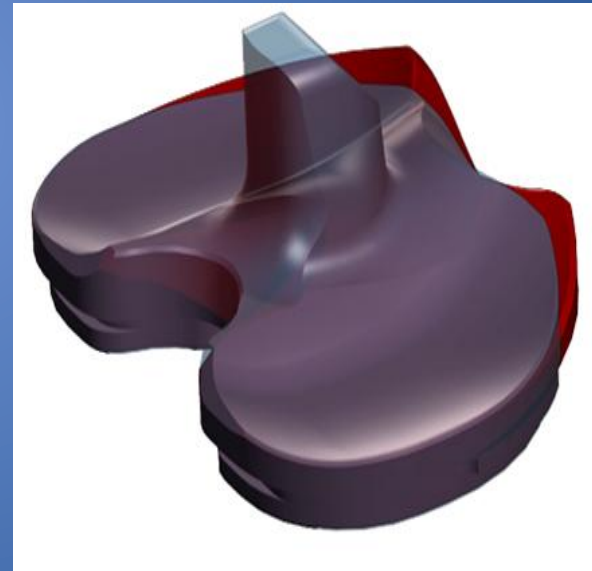
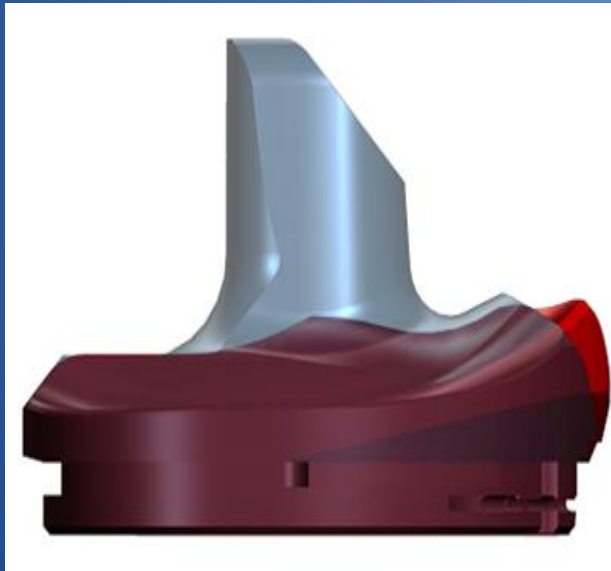
Introduction: Study Hypotheses

- This study compared the clinical and radiographic outcomes of these two devices
- The primary hypothesis was that the clinical outcomes would be equivalent
- The secondary hypothesis was that there would be measurable differences in the perioperative parameters such as tourniquet time and blood loss.

Materials / Methods

- Prospective, randomized study
- Compared the outcomes of the Stryker Triathlon® PS tibial insert vs CS lipped tibial insert
- 56 patients received the PS knee;55 patients received the CS

Materials / Methods-Implants



Materials / Methods

- Inclusion Criteria: Patients with osteoarthritis undergoing primary total knee arthroplasty were screened
- Exclusion Criteria:
 - BMI > 40
 - Age > 80
 - Inflammatory arthritis
 - Prior osteotomy
 - Neuromuscular disease, metabolic bone disease, infection

Materials / Methods

- Assessments were performed preoperatively, 6 weeks, 6 months, and annually
 - Knee Society Score (original version, 1989)
 - Lower Extremity Activity Scale
 - Full xrays series incl. long-standing xrays for alignment
- Perioperative data collected included:
 - EBL
 - Total Hemovac drainage
 - Hgb pre and postop

Materials / Methods-Surgical Technique

- All surgeries performed by single surgeon with identical technique:
 - Tourniquet utilized
 - Medial parapatellar arthrotomy with eversion of patella
 - Measured resection technique, posterior referencing, IM femoral/EM tibial instrumentation
 - No navigation/”MIS”
 - Cement fixation, patella resurfaced
 - PCL (if present) always sacrificed

Results

- The mean follow-up period was 45 months (range, 30 - 57 months)
- There were no statistically significant differences in:
 - Preop demographic characteristics
 - blood loss
 - pre- & postoperative hemoglobin values

Results-Clinical and Radiographic Outcomes

- There were no significant differences in any clinical or radiographic parameters between groups at preop, 1 year, or 2 years postop incl.
 - the Knee Society scores
 - the Lower Extremity Activity Scale
 - ROM
 - alignment (preoperative versus 1-year postoperative)

Knee Society Pain/Motion Scores

	PS Total (Men/ Women)	CS Total (Men/ Women)	<i>P</i> value
PreOp	50.3 (54.3/46.3)	48.6 (52.5/44.9)	.74
2 Yrs PO	94.3 (90.8/97.7)	91.4 (91.8/91.0)	.84

Results-Range of Motion

	PS Total (Men/ Women)	CS Total (Men/ Women)	<i>P</i> value
Mean ROM			
PreOp	5.9/114.0	4.7/114.7	.84
2 Yrs PO	1.2/125.1	1.0/124.4	.87

Results-Transfusion & Tourniquet Time

PRBC	PS (n = 56)	CS (n = 55)	P value
<u>Overall</u>	<u>.42</u>	<u>.22</u>	<u>.16</u>
<u>Male Subgroup</u>	<u>.33</u>	<u>0</u>	<u><.039</u>

Tourniquet Time	PS (n = 56)	CS (n = 55)	P value
	<u>37.20</u>	<u>33.86</u>	<u><.002</u>

Results-Complications

- There were no infections, or other surgical or device-related complications
- There were 2 reoperations:
 - Patella fracture at 6 months (CS)
 - Traumatic loosening of tibial baseplate secondary to MVA @ 1 Yr (PS)

Discussion

- As hypothesized, there were no objective differences in the clinical and radiographic outcomes between the two groups, over the minimum 2 year follow-up
- The ROM data reveals that rollback provided by a post/cam device is not required for excellent flexion
- There was a statistically longer tourniquet time for the PS group and
- more blood transfused in the male PS subgroup

Conclusion

- No superiority of either device in terms of clinical outcomes
- Differences in perioperative outcomes, which may have financial and other implications
 - Cost of OR time
 - Cost and risk of transfusions
- Data supports the use of a PCL-substituting design as an alternative to the PS device
- Continued follow-up & greater enrollment will be required to determine if there are differences in long-term outcomes

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Thank You

