

Tibia Placement Difference Between The Supine And Prone Position After Total Knee Arthroplasty

The Comparison Of The BCS and PS-TKA



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Financial disclosure



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No COI and financial conflicts to disclose are existed on this study

Backgrounds

Although the total knee arthroplasty (TKA) is the main surgical treatment for the severe knee osteoarthritis, the degree of satisfaction reported has been relatively low. One of the potential reasons of low satisfaction of TKA would be, conventional TKA designs cannot reproduce normal knee kinematics and function due to the lack of the anterior cruciate ligament (ACL).



Purpose

The purpose of this study was to evaluate the anterior tibial translation (ATT) in the prone position after TKAs.

Methods

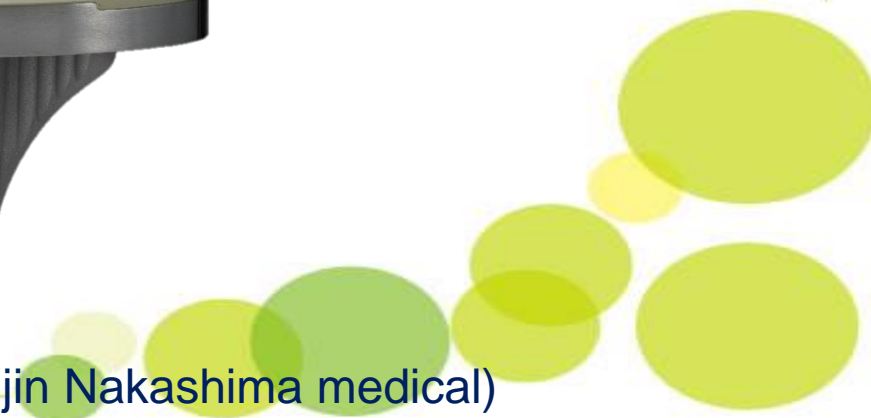
Twenty-one subjects (21 knees) undergoing bi-cruciate substituting (BCS)-TKA (Journey II: Smith and Nephew) and 24 subjects (24 knees) undergoing posterior stabilizing (PS)-TKA (Teijin Nakashima Medical, Japan), were included in this study.



Journey II BCS (Smith and Nephew)



Future knee PS (Teijin Nakashima medical)



Radiographic evaluation

Approximately 6 months after surgery, and when the subjects had recovered their range of knee motion, following the Mae's method (Skeletal Radiol. 2018), accurate lateral radiographic imaging of the knee was performed with full knee extension in supine position and prone position.

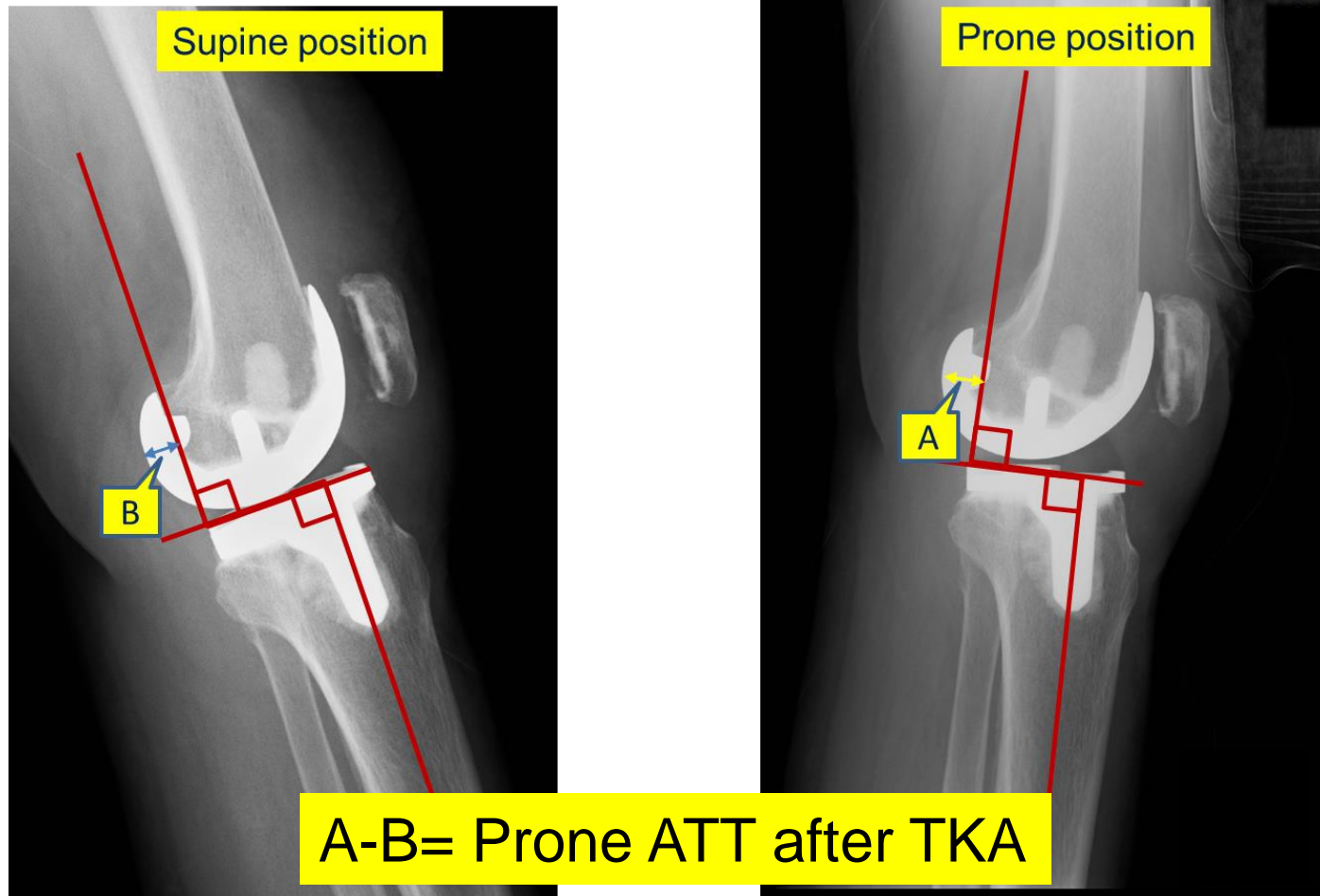


Passive knee extension in supine position



Active knee extension in prone position

Measurement of prone ATT after TKA



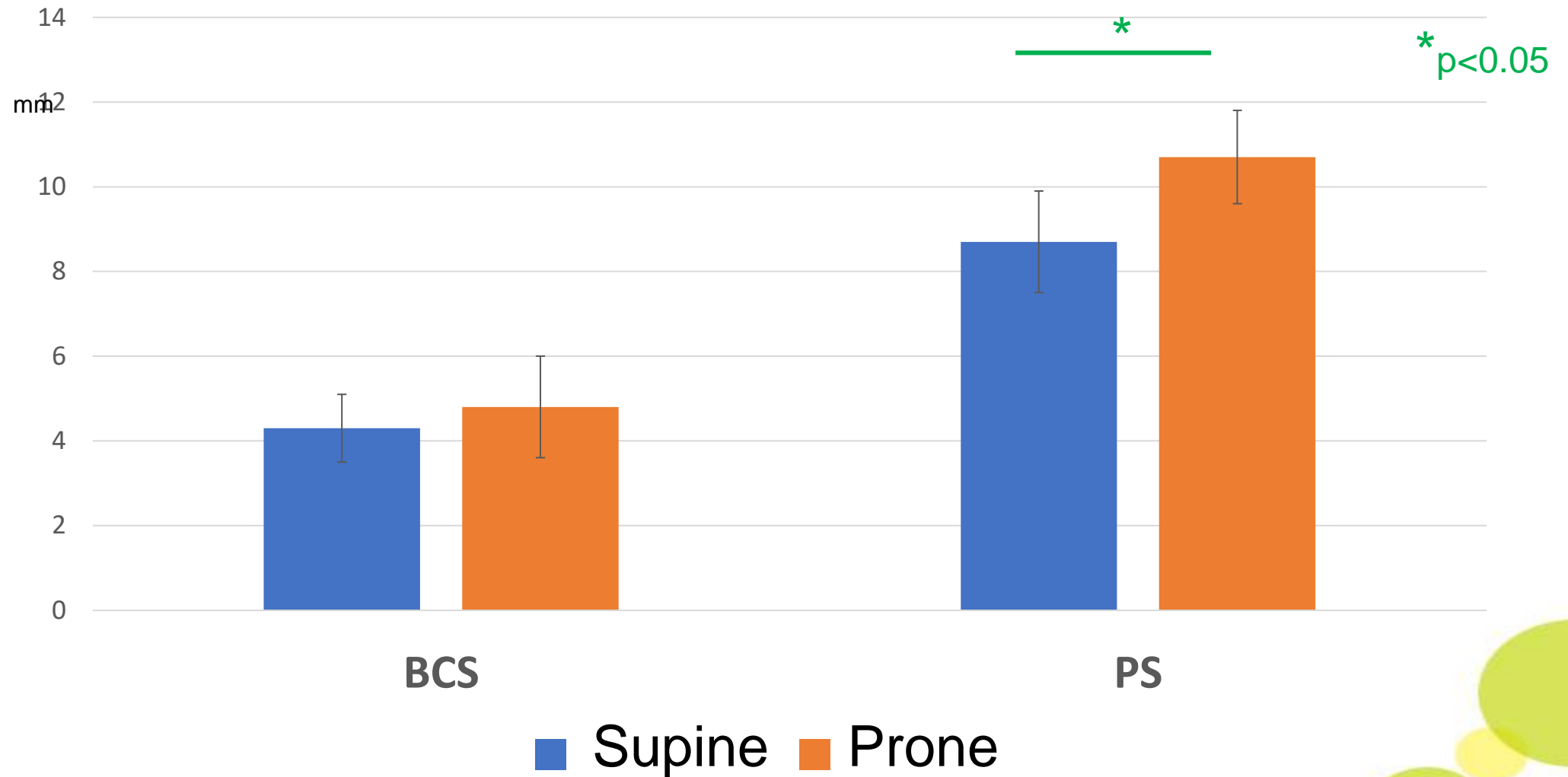
The maximal protrusion length of the femoral posterior component, posteriorly to the extension line parallel to the tibial shaft from the edge of the posterior tibial plateau was measured on the lateral radiographs. The length difference between the prone and supine position was regarded as the prone-ATT.

Statistical analysis

The posterior protrusion length of the femoral component, and the prone-ATT were compared between BCS and PS-TKAs (Mann-Whitney's U test).

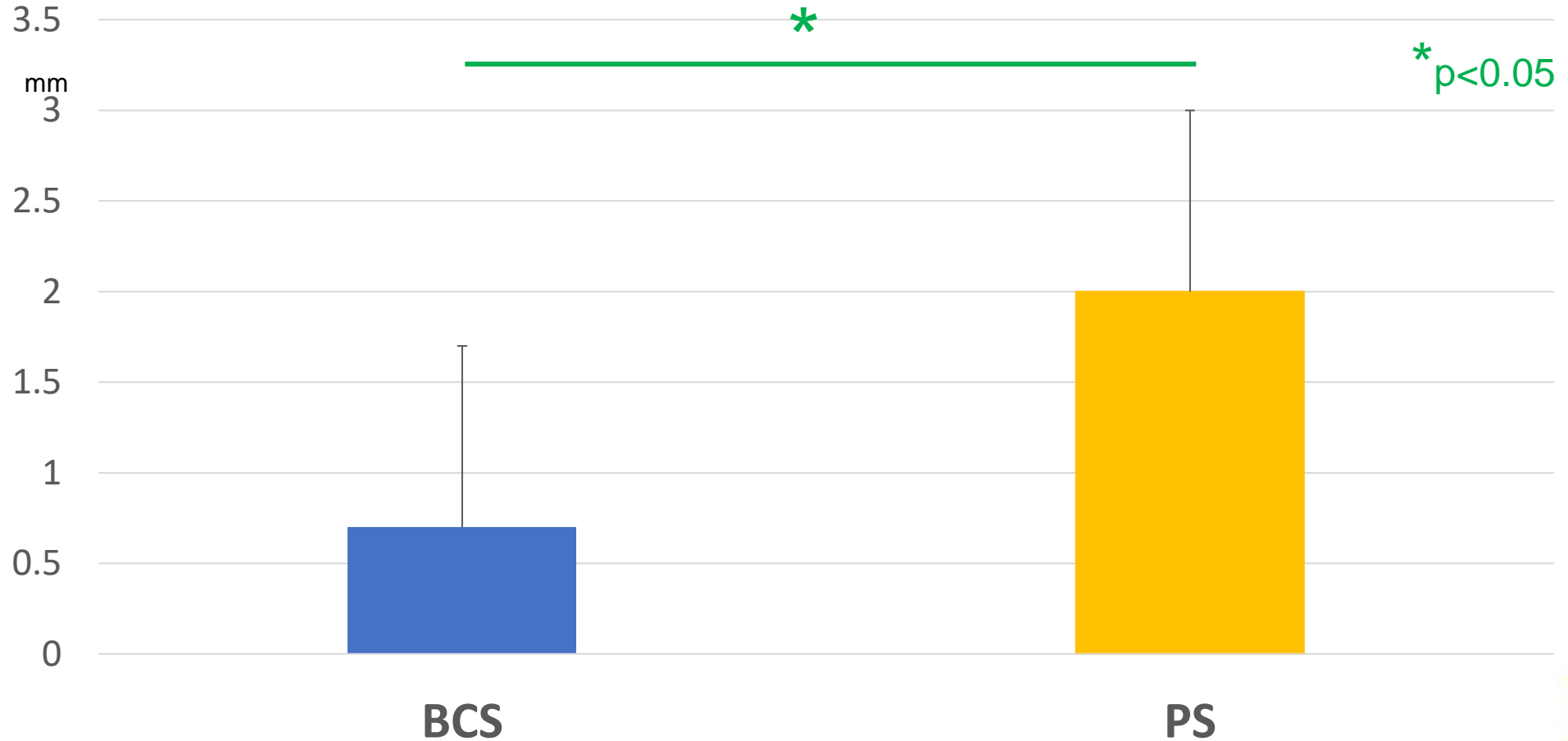


Results: Posterior protrusion length of femoral component



Posterior protrusion length of the femoral component was not changed in the BCS-TKA between supine and prone position, however, it was significantly increased in the PS-TKA.

Results: Prone ATT after TKA



PS-TKA showed significantly larger prone-ATT than that of BCS-TKA.

Discussion: Reported ATT after TKAs

Anteroposterior Translation Does Not Correlate With Knee Flexion After Total Knee Arthroplasty

Yoshinori Ishii MD, Hideo Noguchi MD,
Mitsuhiro Takeda MD, Junko Sato MD,
Shin-ichi Toyabe MD

CORR 2014

Table 2. Preferred values for postoperative AP translation

Study	Implant design	PCL	AP translation
Chouteau et al. [3]	(Innex [®] PCL retaining design	Retaining	12–13 mm
Itokazu et al. [8]	Miller-Galante [®] PCL-retaining PCL-retaining design	Retaining	5.05 mm
Jones et al. [10]	PCA [®] or Duracon [®] prostheses	Retaining	5 to 10 mm
Seon et al. [21]	e.motion [®] PCL retaining design	Retaining	7.1 mm
Warren et al. [24]	Insall-Burstein [™] posterior stabilized knee	Substituting	Greater than 5 mm
	Kinemax [®] condylar knee	Retaining	
	Oxford meniscal knee	Retaining	
Yamakado et al. [26]	Yoshino/Shoji-4 PCL-retaining design and Anatomic Graduated Components-Shoji PCL-retaining design	Retaining	9.71 mm

Reported postoperative ATT of PS or CR TKAs were **5 to 13 mm**

Discussion: Prone ATT after BCS and PS-TKAs



The considerable reason why the BCS-TKA showed significantly small prone ATT than PS-TKA were, ACL function of the BCS TKA and native tibio-femoral relationship of the BCS TKA.

Conclusion

Even in the everyday position like prone position, PS-TKA showed significantly larger ATT than BCS-TKA. Better anterior knee laxity after TKA would be influenced to the clinical results or discomfort feeling of the TKA.



Thank you



*~Learning is forever, always learning from mistakes~
Freddie H. Fu*