

Application of kneeling view for the assessment of posterior laxity after TKA: are there any differences between posterior-stabilized and medial-pivot prosthesis?

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Abstract

Knee instability after prosthetic surgery is one of the major causes of failure. The objective of the study was to evaluate posterior laxity following total knee replacement (TKR) implantation, using a single prosthesis model and comparing polyethylene inserts with medial-pivot (MP) and posterior-stabilized (PS) by means of the evaluation of radiographic images under load ("kneeling view").

Materials and methods:

Fifty patients with primary knee osteoarthritis (KOA) were divided into two groups: in group A (25 patients) was implanted a third generation medial-pivot (MP) knee prosthesis while in group B (25 patients) was implanted a posterior-stabilized (PS), produced by the same company. The surgical technique involved removal of the posterior cruciate ligament (PCL). All patients underwent a kneeling view under load with knee at 90 degrees at 3 months after surgery and were clinically evaluated at 1 year using the Knee Society Score (KSS) and the Oxford Knee Score (OKS). The measurement on radiographs was made by drawing a tangent line along the posterior cortex of the tibia and measuring the length of the perpendicular to this line from the most posterior point of Blumensaat's line.

Results:

No statistically significant differences were identified in terms of clinical outcomes (KSS and OKS) between the two groups (MP group with mean KSS of 165 and OKS of 41; PS group with mean KSS of 161 and OKS of 40). Radiographic evaluation showed greater stability in flexion (less posterior translation of the tibia) in the MP group (2.2 mm; SD \pm 4.6mm) compared to the PS group (5.7 mm; SD \pm 3.6mm): such difference

was statistically significant ($p = 0.019$).

Conclusions:

The MP implant showed better stability in flexion than the PS: this shows that the implants with high medial congruence avoid the "mid-flexion instability" and guarantee lesser degree of constraint. This study highlights the importance of a precise surgical technique, focusing attention on balancing the extension and flexion spaces: the level of the constraint appears to be less important when it is possible to recreate optimal knee stability intraoperatively.