

The Controlled Posterior Condyle Milling Technique: Achieving Minimal Proximal Tibia Resection While Balancing Gaps During Medial Fixed-Bearing Unicompartmental Knee Arthroplasty

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Background

Surgical techniques for unicompartmental knee arthroplasty (UKA), including the resection level of the tibia and balancing gap tightness, are under investigation. Minimizing proximal tibia resection is associated with good clinical outcomes and fewer periprosthetic fractures. The success of conversion to subsequent primary total knee arthroplasty depends on preservation of as much proximal tibia as possible. This video demonstrates a novel surgical technique to balance gap tightness while minimally resecting the tibia during fixed-bearing UKA and discusses the clinical utility of this new technique.

Methods

Research included patients who underwent medial UKA for isolated medial compartment osteoarthritis, with a minimum follow-up of 2 years. Patients who enrolled in the study were divided into two different groups: the conventional group or the controlled posterior condyle milling (CPCM) group. The UKA procedure was same for both groups; however, proximal tibia resection and gap balancing were different. In the CPCM group, the proximal tibia was resected at the level of the distal end of the subchondral bone. If the flexion gap was tighter than the extension gap, then the posterior condyle was milled to adjust gap tightness. Standing knee radiographs and scanograms were obtained to evaluate alignment and the amount of tibial resection. Range of motion and Western Ontario and McMaster Universities Osteoarthritis Index scores were used to evaluate clinical outcomes.

Results

Significantly less tibial resection was performed in the CPCM group (3.58 ± 1.86 mm) compared with the conventional group (5.16 ± 2.69 mm; $P < 0.001$). Postoperative range of motion and Western Ontario and McMaster Universities Osteoarthritis Index scores were not significantly different between the two groups ($P = 0.120$ and $P = 0.129$). Postoperative periprosthetic fractures occurred in two patients in the conventional group, whereas no periprosthetic fractures were reported in the CPCM group.

Conclusion

Controlled posterior condyle milling may be a simple and useful intraoperative technique that can aid in minimizing tibial resection while balancing flexion and extension gaps during medial fixed-bearing UKA. The current technique may not only spare the tibia but also negate the need for changing posterior tibial slope or the need for smaller component sizes to balance the gaps.