

In-Vivo Tibial Fit Analysis of Customized, Patient-Specific TKA Versus Off-the-Shelf TKA

Gregory Martin, MD

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Introduction

The purpose of this study was to intra-operatively compare tibial fit of a customized, patient-specific TKA implant to that of off-the-shelf (OTS) TKAs in the same patient.

Methods

- 33 patients undergoing customized TKA surgery were compared to OTS TKAs to assess tibial tray fit intra-operatively.
- After tibial preparation, a series of tibial trials from 3 OTS-TKA designs were fit, while maintaining proper rotational alignment.
- Implant fit (overhang/underhang) for the best-matched trial of each OTS-TKA was recorded in four tibial zones (Figure 1).
- Once all measurements were completed, the customized tibial tray was implanted, and measurements were repeated.

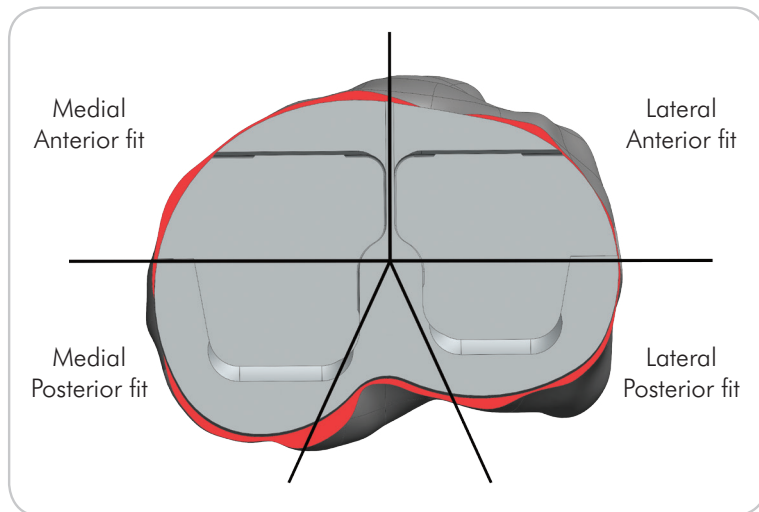


Figure 1: Schematic of the tibial zones defined for tibial fit assessment.

Results

Table 1: Distribution of underhang and overhang between the four groups analyzed

	OTS 1 (%)	OTS 2 (%)	OTS 3 (%)	Customized (%)
Overhang \geq 3mm	21	21	21	0
Underhang > 3mm	30	30	39	12

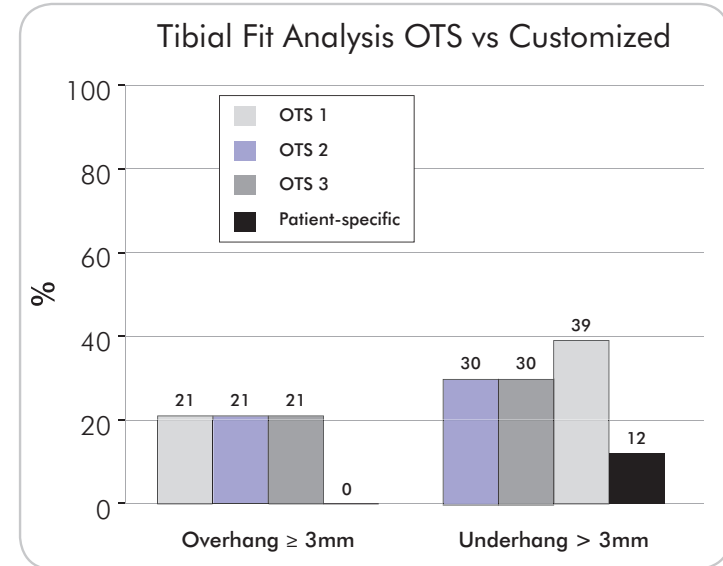


Figure 2: Distribution of underhang and overhang between the four groups analyzed

Discussion

Results show that customized TKAs significantly improve tibial fit when compared to OTS TKA. This could play an important role in reducing knee pain and patient dissatisfaction, resulting from overhanging components, soft-tissue impingement as well as implant loosening due to poor tibial bone support and resultant subsidence.