

Does Femoral Component Sizing Differ Between Robotic-Assisted Versus Manual Total Knee Arthroplasty?

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Introduction

- Studies have demonstrated superior clinical outcomes when smaller or equivalent sized femoral components are utilized in primary total knee arthroplasty (TKA) relative to the tibial component.
- The purpose of this study is to compare femoral and tibial component sizes in manual versus robotic-assisted TKA.

Methods

- Femoral and tibial component sizing were recorded from 4/2018-7/2021.
- A total of 260 patients (130 manual and 130 robotic-assisted TKAs) with same implants were used for both cases. Cases were listed as being:
 - equal sizes for femur and tibia components
 - smaller femur relative to the tibia component
 - larger femur relative to the tibia component

Results

For manual TKA, 55.5% had equal sized femoral and tibial components, 23.4% had smaller femoral components, and 21.1% had larger femoral components. For robotic-assisted TKA, 57.7% had equal sized components, 34.6% had smaller femoral components, and 7.7% had larger femoral components. While there were smaller femoral components utilized in robotic-assisted TKA, the difference was not significant ($p=0.085$).

Table 1 - Results

	Manual	Robotic
Femoral Component Size	N = 128	N = 130
Smaller Femur	30 (23.43%)	45 (34.61%)
Equal Size	71 (55.46%)	75 (57.69%)
Larger Femur	27 (21.09%)	10 (7.69%)
Polyethylene Size	N = 129	N = 130
9/10 mm	35 (27.13%)	65 (50%)
11/12 mm	45 (34.88%)	51 (39.23%)
13 mm	28 (21.7%)	10 (7.69%)
>13 mm	21 (6.27%)	4 (3.07%)

Conclusion

- Robotic-assisted TKAs utilized a greater percentage of smaller femoral components relative to tibial components compared to manual TKAs.
- Thinner polyethylene were also utilized in robotic TKA, indicating less bone loss.
- Further studies are needed to elucidate if findings correlate to patient reported outcomes and long-term survivorship in manual versus robotic-assisted TKA.

References

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