

Risk and Timing of Total Knee Arthroplasty Following High Tibial Osteotomy: A Cohort Study with 10-Year Follow-Up

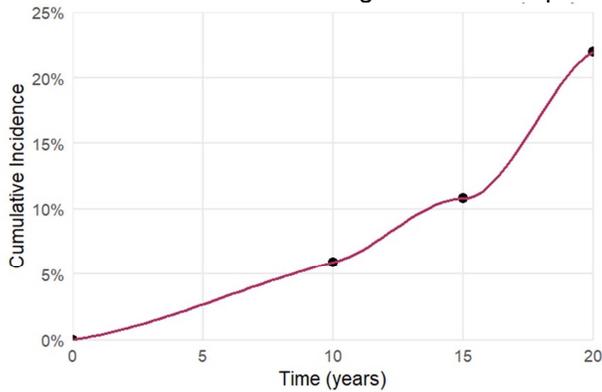
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INTRODUCTION: High tibial osteotomy (HTO) is a joint-preserving procedure for knee osteoarthritis aimed at delaying or eliminating the need for total knee arthroplasty (TKA). The risk of progression to TKA following HTO still remains incompletely understood.

METHODS: Patients undergoing HTO at a single academic center from 1996 to 2015 were identified using a de-identified synthetic data platform, ensuring a minimum of 10 years of follow-up. Patients ≥ 18 years old with procedural codes for HTO were included. The primary outcome was TKA incidence; the secondary outcome was time to TKA. A modified Poisson regression evaluated associations between TKA, age, and BMI among individuals with complete BMI data.

RESULTS: A total of 207 patients (mean age, 41.3 ± 11.2 years; 62.8% male) were identified. Mean follow-up was 17.8 ± 4.8 years. Overall, 20 patients (9.9%) underwent TKA (**Figure 1**). Those converting to TKA were significantly older at HTO (45.3 ± 6.1 vs. 40.9 ± 11.6 years; $p = 0.009$) and had higher BMI (35.7 ± 6.4 vs. 29.4 ± 5.2 ; $p = 0.01$). TKA incidence increased over time: 5.9% at 10 years, 10.8% at 15 years, and 22.0% at 20 years (**Table 1**). Higher BMI was independently associated with increased TKA risk (RR = 1.13; 95% CI, 1.04–1.23; $p = 0.004$).

DISCUSSION AND CONCLUSION: In this cohort with minimum 10-year follow-up, HTO demonstrated 90% knee survivorship at a mean of 17.8 years, demonstrating that it is an effective procedure to delay or remove the need for an arthroplasty. Age and BMI at the time of HTO were associated with increased risk of TKA conversion and should be considered during patient counseling and selection.



Follow-up Period	Total Individuals with HTO	Total Number with TKA	Percentage without TKA (%)
10 years	202	12	94.1
15 years	148	16	89.2
20 years	91	20	78