Tibial Stems Used in Primary Total Knee Arthroplasty Lowers All-Cause Revision and Revision for Loosening: Analysis of Data from a Large National Arthroplasty Registry

Jess Osan, Benjamin Wall, Ian Harris[1], Yi Peng, Piers Yates, Christopher Wynne Jones
[1]UNSW Sydney

INTRODUCTION:
We aimed to analyze the utilization of tibial stems for primary total knee arthroplasty (TKA) performed for osteoarthritis.
METHODS:
The study period was September 1999 to December 2020. Data from a large national arthroplasty registry included all primary TKA procedures undertaken for osteoarthritis (OA) using cemented tibial fixation with the five most used stemmed and non-stemmed prostheses. Reasons for revision and type of revision were assessed.
RESULTS:
There were 121,085 primary TKA procedures for OA of which 12,930 (11%) were stemmed and 108,155 (89%) were non-stemmed. The CPR at 19 years was 6.5% (95% CI 5.1, 8.3) for stemmed and 6.6% (95% CI 6.1, 7.1) for non-stemmed. Stemmed TKA had a higher rate of all-cause revision compared to non-stemmed TKA for the first 6 months (HR=1.54 [95% CI 1.23, 1.94]; p< 0.001). There was no difference between the two groups after this time until 1.5 years when the risk of revision changed and stemmed TKA had a significantly lower rate of revision (HR=0.84 [95% CI 0.72, 0.98]; p=0.028) [Fig1].
Stemmed components were more likely to be revised for infection in the first 6 months only (HR=1.55 [95% CI 1.18, 2.03]; p=0.001); thereafter there was no difference. Aseptic loosening was higher in the non-stemmed group after 2 years (HR=2.20 [95% CI 1.52, 3.18]; p<0.001); there was no difference prior to this time [Fig 2]. Insert only revision was higher in the stemmed group (HR=1.45 [95% CI 1.22, 1.71]; p<0.001). Isolated tibial component revision was increased in the non-stemmed group (HR=2.37 [95% CI 1.44, 3.92]; p<0.001). Aseptic loosening as the indication for tibial component-only revision was significantly higher in the non-stemmed group (HR=4.03 [95% CI 1.90, 8.54]; p<0.001).
DISCUSSION AND CONCLUSION:
Patients undergoing primary stemmed TKA have lower rates of all-cause revision beyond 1.5 years and revision for aseptic loosening beyond 2 years. Further investigation is required to identify factors affecting this relationship to preoperatively select patients who may benefit from stems in primary TKA.

Figure 1: Cumulative Percent Revision of Cemented Tibial Primary Total Knee Replacement by Stem Extension (Primary Diagnosis OA)

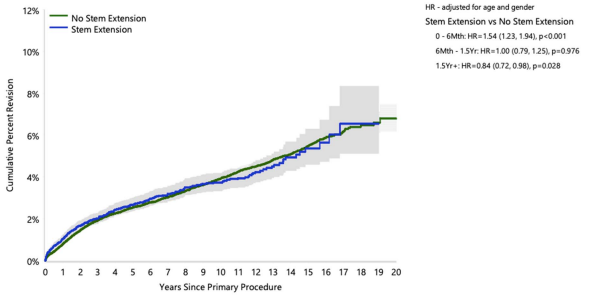

Figure 2: Cumulative Percent Revision of Cemented Tibial Primary Total Knee Replacement by Stem Extension (Primary Diagnosis OA, Revision for Loosening)