

10-Year Follow-up for a New 3D Printed Cementless Total Knee Arthroplasty

Nicolina Zappley, Santiago Restrepo, Andrew Fraval, Alvin C Ong, William J Hozack¹

¹The Rothman Institute

INTRODUCTION:

Cementless total knee arthroplasty (TKA) offers the potential for durable fixation through biologic integration as compared to cemented TKA where fixation is achieved through mechanical interdigitation of the cement. No 10-year results are available for newer cementless TKA designs which have incorporated additive manufacturing (3D printing). The purpose of this study is to present 10-year survivorship and clinical/radiographic outcomes of a newer cementless TKA design.

METHODS:

This is a single institution registry review of prospectively obtained data from a total of 113 cementless TKA at 10-year follow-up. Outcomes were determined by comparing pre- and post-operative Knee Injury and Osteoarthritis Outcome Score for Joint Replacement (KOOS JR) scores and pre- and post-operative 12 item Veterans RAND/Short Form Health Survey (VR/SF-12). Aseptic loosening as well as revision for any reason were the endpoints used to determine survivorship at 10 years.

RESULTS:

The overall survivorship was 96.46% at 10 years, and survivorship for aseptic loosening as the endpoint was 98.2%, with a 99.1% survivorship of the 3D printed tibial component. Four revisions were performed (all within 2 years postoperatively) for an overall revision rate of 3.54% - 2 infection (1.77%), and 2 loosening (1.77%). No new loosening was identified after 2 years of follow-up. At long term follow-up, the mean KOOS JR score improved from 38.2 pre-operatively to 72.8 post-operatively (p-values = 0.0001), the mean VR/SF-12 scores improved from physical health (PH) – 29.84 pre-operatively to 40.63 post-operatively (p-values = 0.0001), and the mental health (MH) scores improved from 37.02 pre-operatively to 54.35 post-operatively (p-value = 0.0001).

DISCUSSION AND CONCLUSION:

This 3-D printed cementless total knee system shows exceptional survivorship at 10-year follow-up. The design of this implant and the ability to obtain cementless fixation offers excellent long-term durability.