Metaphyseal-engaging short stem femoral implants: five-year follow-up
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Introduction:
While various uncemented femoral implants have demonstrated clinical success in total hip arthroplasty (THA), there are still a number of issues which remain to be addressed. These include the continuing problems of proximal-distal mismatch, optimized proximal load transfer, and facilitation of minimally invasive surgery. We present the five-year clinical and radiographic performance of a CT-based custom-made metaphyseal-engaging short stem femoral implant.

Materials & Methods:
Between 2004 & 2005, 72 patients underwent 80 THAs with an uncemented metaphyseal-engaging short stem. We present the clinical and radiographic results of 69 THAs. The implant was custom-made based on pre-operative CT to fit and fill the metaphysis. It was composed of a titanium alloy with a hydroxyapatite coating on a titanium plasma-spray in the proximal third of the stem. These patients averaged 61 years of age (range 22-79) and BMI of 28.9 (20.3 – 44.1) at follow-up.

Results:
Clinical performance was evaluated using the Harris Hip (HHS) and WOMAC scoring systems, both preoperatively and 5 years post-operatively. HHS averaged 55 (range 20 – 80) pre-operatively and 96 (range 55 – 100) post-operatively. WOMAC scores average 51 (range 13-80) pre-operatively and 3 (0 – 35) post-operatively. No cases of subsidence or peri-operative fractures were observed and no revision surgeries have been performed. Bone remodeling was typified by endosteal condensation and cortical hypertrophy in Gruen zones 2, 3, 5, and 6.

Discussion:
At five-year follow up the uncemented metaphyseal-engaging short stem is stable and exhibits proximal bone remodeling closer to the metaphysis than conventional stems. Furthermore, this device has comparable clinical performance as previously evaluated conventional and off-the-shelf short stem implants. Although we have no revisions to report, theoretical bone preservation from a proximally loaded femur remains a potential advantage to this design.