Title: A Multi-Centre, Randomized Controlled Trial Comparing a Second-generation Uncemented Trabecular Metal-backed versus Cemented Polyethylene Glenoid Component in Total Shoulder Arthroplasty: Five-year Results

Authors: Patrick Chin, MD; William Regan, MD; Derek Plausinis, MASc, MD, Zane Zarzour, MD; Fay Leung, MD; Brendan Lim, MD; Kayla Johnston, MSc; Treny Sasyniuk, MSc.

Study Summary: Total shoulder arthroplasty (TSA) is a successful surgery for managing patients with advanced shoulder arthritis and an intact rotator cuff. However, complications associated with the glenoid implant remain an issue with the potential to negatively impact a patient's quality of life and clinical outcomes. As such, glenoid implant design has continued to evolve with the goal of reducing implant failure and the need for revision surgery. The trabecular metal (TM) glenoid implant was created to address issues related to implant loosening seen with the traditionally used polyethylene (POLY) glenoid component. We conducted a multi-centre randomized controlled trial comparing a second-generation TM glenoid versus a POLY glenoid in patients undergoing a primary TSA to compare patient-reported, clinical, and radiographic outcomes. We previously reported our two-year postoperative findings, and the purpose of the current study is to report our five-year postoperative results.

Five surgeons from three centres participated and we randomized 93 patients to receive either an uncemented second-generation TM glenoid or cemented POLY glenoid implant. At five-years postoperative, no glenoid implant failures were observed in either group. Further, there were no statistically or clinically significant differences between the two implants with respect to quality of life, patient-reported outcomes, and shoulder function. Complication rates were similar between the two groups, however a greater number of complications in the TM group required additional surgery than those in the POLY group (13% versus 8.5%, respectively). Although a higher proportion of patients with a TM glenoid required additional surgery, only one complication was glenoid related (specifically, one infection in the TM group). Metal debris was observed in 24% of patients with a TM glenoid but was low grade and did not negatively influence implant survival, patient-reported outcomes, or shoulder function.