Short Stems in Total Hip Arthroplasty

Timothy McTighe, Dr. H.S. (hc)*
Declan Brazil, PhD., John Keggi, M.D., S. David Stulberg, M.D., Robert T. Kennon, M.D., Louis Keppler, M.D., Adrian van dev Rijit, M.D., Edward J. McPherson, M.D.

Over the past 10 years, the orthopaedic community has witnessed an increased interest in more conservative surgical techniques for hip arthroplasty. During this time, second-generation hip resurfacing and minimally invasive surgery (MIS) enjoyed extensive marketing attention. After a decade of this renewed interest, both of these methods for THA have met with serious concerns. As hip resurfacing numbers decline, both patients and surgeons are looking for other potentially successful conservative treatments to THA. This search has recently focused surgeon interest toward short-stem designs.

Potential Advantages of Short Stems

Short stems offer numerous advantages. First, with some short stem designs, a majority of the femoral neck is preserved. Surgically, this requires less surgical dissection and mitigates soft tissue and bone damage. Ultimately, preservation of the femoral neck provides a more natural barrier to migration of particulate debris, is associated with less blood loss and less time and energy to rehabilitate the hip, reduces stress shielding of the proximal femur (i.e., load redistribution and subsequent loss of proximal femoral bone mass), and reduces end-of-stem thigh pain. In consideration of all these aforementioned advantages, the use of a short stem can make patient rehabilitation faster and less painful. Because of its smaller size, the short stem is easier to insert, and this facilitates a more minimally invasive surgical approach. The novel design feature inherent in short-stem implants—namely, preservation of proximal native bone and tissue—theoretically affords easier revision surgery if or when it becomes necessary. For these reasons, short-stem procedures also have broader indications compared with hip resurfacing. Finally, many short stem designs do not require many stem sizes. This translates to simplified instrumentation and reductions in requisite surgical inventory (e.g., instruments and implants). This can provide a significant net savings to health care facilities.

JISRF Stem Classification System

The Joint Implant Surgery and Research Foundation (JISRF) has developed and advocated a stem classification system by primary stabilization contact regions to help identify, differentiate, and catalog stems for total hip replacements.

It is of interest to note most European experience with short stems is in the area of neck preserving styles compared to the United States that prefers metaphyseal style stems.

Our surgeon co-authors have extensive experience with both short curved neck stabilized and metaphyseal stabilized stems. All results with both styles have been rewarding.

The short curved neck stabilized stems have demonstrated excellent clinical results with over 98.6% survivorship (USA). For a first generation new design concept with new developmental instrumentation has provided a safe, effective and reliable construct for our younger more active patients. Improved bone remodeling has been impressive. Retaining the femoral neck has significant mechanical advantages in reducing both axial and torsional loads. Note: We have had two pseudo tumors (since 2007 AU/2010 USA) one in Australia and one in the United States both had MoM bearings. There is a short learning curve but definitive.

We are encouraged and continue to use and evaluate these devices.