The Science Behind a Short (Neck Preserving) Curved Stem Total Hip Replacement

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Introduction
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.

Examples of Short Stem Designs
The Joint Implant Surgery and Research Foundation (JISRF) has developed and advanced a stem classification system by primary sublimation contact regions to help identify, differentiate, and catalog stems for total hip replacements. 1

Historical Review of THA Conservative Cementsless Implants
Modern-Day Conservative Implant Designs For THA Started In Europe With The Introduction Of The Thomsen Plate In 1975. Similar To The Philip Wilks Hip Replacement From 1938.

Little Know Work Neck Sparring Stem Design From Brazil
Historical Lage Foundation designs have made it difficult to compare results.

Two Significant Designers that impacted and influenced designs of short stem.


Pipino first presented the femoral neck-conserving Biodynamic™ hip prosthetic for cementless fixation in 1979. c.c. material with sintered heads

In 1982, B. F. Money Mayo Clinic Stem was designed a short (60 mm), double-opposed tibiae for short femoral stem with a modular head. Trapezoidal alloy with proximal 1/3 distal 2/3. (Zimmer)

K. Keggi Experience
40+ years Dual incision for 30+ years Helpful with heavy patients for femoral canal preparation and insertion of modular stems.

FEA modeling for short curved neck preserving stem with a proximal novel cortical “Flare” has demonstrated better potential for bone remodeling compared to previous short stem “Biodynamics™.”

Revision rate within the study was 17.9%, compared with 17.2% outside the study (and thus 4.8% overall).

The survival estimate is above 98.6% This report does not account for non-reporting or competing events that preclude revision such as death.


demne new bone growing up to cortical flare

The design philosophy of neck retaining implants achieves osseous integration in a very small area of femoral neck, maintaining physiological load, bone stock and function. The preservation of the femoral neck reduces both torsional and axial bounding moments providing improved mechanical environment of the implant.

Conclusion

REVISION RATES

- 78 Australia MSA™ Stems by: Adrian van der Rijt 1 revision (for aseptic loosening) = 1.2% Revision Rate
- 108 Australia MSA™ Stems total new-study = 3 (Revision) = 1.7% Revision Rate
- 39 Australian Study had 7 revision =17.9%
- 208 Combined total = 4.8% Revision Rate
- 576 USA ABC™ stems by: J. Keggi, MD; L. Keppler, MD; B. Kennon, MD; T. Dyson, MD; E. McPherson
- 576 ABC™ stems = 10 revisions 2 aseptic loosening, 4 infections, 2 chronic dislocations, 4 cup removal and conversion to neck preserving with new neck, 2 aseptic loosening, 1 neck disassociation, =1.7% Revision Rate

- Worldwide Survival with removal of AU study survival = 1.4% Revision Omnilife science
- Rate TSI Study Group = 1.7% Revision Rate
- 2,263 USA ABC™ stems since April 2010: 98.6% survival = 1.4% Revision Omnilife science
- Overall World Wide Survival with removal of AU study = 1.5% Revision Rate
- Worldwide Survival Rate with AU Study Removed = 98.5%

Short curved Neck Preserving Stems
- Improved bone remodeling compared to previous porous coated stems (AML style).

FEA modeling has demonstrated better potential for bone remodeling for the Short Curved Neck Sparring compared to previous porous coated stems (AML style).

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