ICJR | International Congress for Joint Reconstruction

Poster 68
April 27-29, 2012, Coronado, California

THE FIRST 1,225 SHORT CURVED NECK SPARING STEMS – CLINICAL SURGICAL OBSERVATIONS

BY

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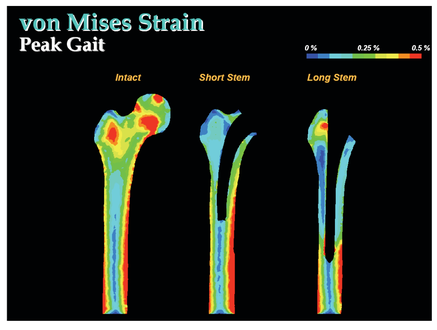
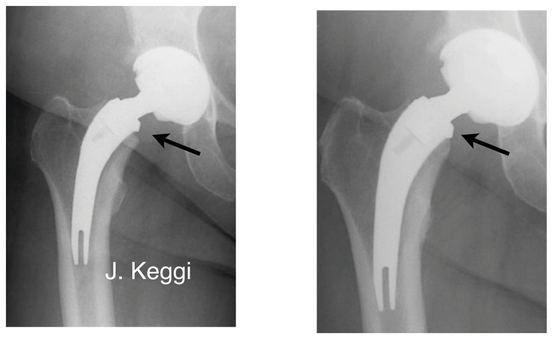
Introduction: Architectural changes occurring in the proximal femur after THA continues to be a problem. Proximal stress shielding occurs regardless of fixation method. The resultant bone loss can lead to implant loosening and or breakage of the implant. We are seeing younger patients with higher levels of physical activity as compared to just a decade ago. A tissue sparing total hip stem provides for less tissue damage, a quicker rehab and leaves behind more infrastructure in case of future revision surgery.



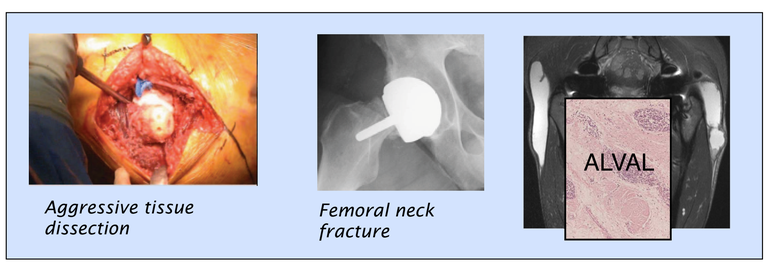
FEA Modeling clearly demonstrates certain style short stems have less stress shielding than certain conventional cementless stems.



1 Yr. follow up demonstrates positive bone remodeling filling in calcar gap with this short curved proximal conical neck sparing stem.

Examples of failures of conventional THA

Patients today demand more out of the hip reconstruction and their increase activity places a higher demand on the implant. A number of the current short stems introduced into the market are no more than standard stems cut short. There is concern with the increase in younger and more active patients that these modified short stems will be adequate to resist the increased biomechanical loads placed on them? There is also concern with the recent findings with MoM bearings that is having a significant negative impact on the long-term viability of that surgical approach.



Aggressive tissue dissection

Femoral neck fracture

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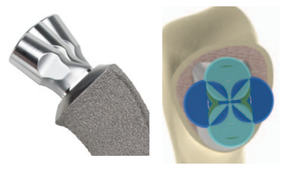
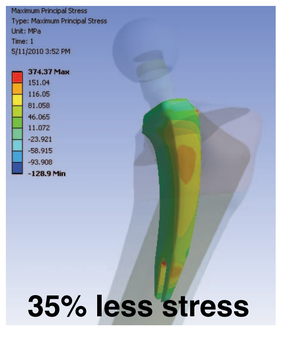
All co-authors are members of the TSI™ Study Group www.jisrf.org

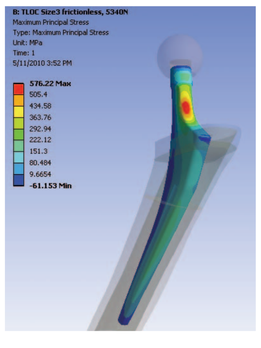
Material: There have been 1225 stems implanted with this novel neck sparing stem design since April 2010 to April 2012 with 700 from the primary surgical team. This included the limited introduction while fine-tuning of surgical instruments. Typical patient profile showed two-thirds being female with an age range overall between 17 to early 90s. 90% were treated for OA. This stem has been used in all Dorr bone classifications (A, B, &C)

Two surgical approaches were utilized the single anterior incision and posterior incision. The ARC™ short curved stem was used with a variety of cementless cups with a variety of bearing surfaces (MoM, CoC, CoP, MoP).

The titanium stem comes in six sizes 0-5 and features a c.c. modular neck that is available in the following styles: Neutral, 8º Varus / Valgus, 12º Varus / Valgus, & 12º Anteverted / Retroverted







Note: There has been recent concern raised over modular necks in conventional cementless stem designs. Neck sparing stems reduce principal tensile stress in the neck 35% compared to monoblock conventional cementless stems.

Stem Distribution
- **Size 0 = 4% newer size**
- **Size 1 = 21%**
- **Size 2 = 36%**
- **Size 3 = 26%**
- **Size 4 = 10%**
- **Size 5 = 3%**

Neck Distribution
- **Neutral = 35%**
- **8º Varus / Valgus = 24%**
- **12º Varus / Valgus = 19%**
- **12º Anteverted / Retroverted = 22% newer size**

Note: Stems 1,2,&3 = 83% usage / Angled Necks = 65% usage (Modular necks aid in restoration of combined version angle.

Results:

Anterior Approach
- Dislocations = 2
- Stem Revisions = 5
- Aseptic Loosening = 2
- Superficial Infection = 2
- Septic Loosening = 1
- Leg / Length Discrepancy +/- 7 mm = 9
- Occult fracture distal end of stem = 1
- Calcar Fractures wired = 2
- Calcar Fractures not wired = 3
- Hip pain = 2
- Subsidence > 5mm = 5
- Intra-op femoral perforation = 3
- Intra-op calcar fractures resulting in stem bailout = 2
- Mismatched Heads = 2

Posterior Approach
- Dislocations = 2
- Stem Revisions = 1
- Aseptic Loosening = 0
- Septic Loosening = 1
- Superficial Infection = 0
- Leg / length Discrepancy +/- 7 mm = 3
- Fractures distal = 0
- Calcar Cracks wired = 0
- Calcar Cracks not wired = 3
- Hip pain = 1 (process of being worked up/ potential spine problem)
- Subsidence > 5mm = 0
- Intra-op calcar fractures resulting in stem bailout = 3

We are encouraged with our initial clinical / surgical observations (patients are happy) and believe the potential and real benefits warrant not only further evaluation but expanded evaluation of this tissue conserving approach to THA.