Rationale of Short “Neck Sparing” Stem Femoral Components

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Disclosure

- In accordance with Professional guidelines the authors acknowledge:

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My Past Hip Stem Preference

1985 S-ROM
Type C bone
2005

Proximal Modular Designs

Apex Modular

K-2
History of Short Stems

Mid-Head Resection
New Trend

Modern Short Stems

Vitallium Judet 1951  Judet grooved 1952  Ferciot 1953

J.E.M. Thompson 1950  Vitallium Thompson 1951
Mayo Type Stems

Three Point Fixation with Lateral Contact
Metha Stem

Note Modular Neck

Proximal Conical Shape
Distal lateral stem contact similar to Mayo stem design
Microplasty Type Hip Stems

Distal crack & post-op stress shielding medial calcar
Standard neck resection with shorter stem length
Proximal Filling with Loading of Lateral Calcar
Short Curved Neck Sparing Stems

Pipino CLS™ Stem

ARC™ & MSA™ Stems
licensed TSI™ technology patents pending

Corin stem
Neck Plugs
Stemless THA
Is this the next generation?
Short Stem Goals

- Initial Stability
- Restore Joint Biomechanics
- Long term Survival
- Decrease Adverse Bone Remodeling
- Facilitate Soft Tissue Sparing Approaches
- Minimize Bone Loss in Cases of Revision
- Decrease Physiologic Insult / Improve Rehabilitation
- Burn no Bridges
HR decreasing use in PTHA
8.9% 2005
8.2% 2006
7.6% 2008
My Head Resurfacing Experience

Art Steffee
Hip Resurfacing

- Steep Learning Curve
- Limited Indications
- Risk of Fracture
- Late Remodeling and Aseptic Loosening
- Limited to MOM Bearings
- Extensive Soft Tissue Dissection
- ? Conservative
Preserve Soft & Hard Tissue

John Keggi will demonstrate the anterior surgical approach after lunch.
Why Save the Neck?

Freeman 1986
Whiteside Biomechanical Advantages
Pipino Preserving blood supply
Torsional loads: A/P resultant force
Neck resection generates significant torsional moment at the stem/bone interface.

Saving the neck reduces bending and torsional forces.
Pipino current stem design CFP™ evolved from his Biodynamic experience.

(ARC design goal to improved proximal load transfer)

- He has experienced improved results over the CrCo material, but still encounters some stress shielding.

- FEA modeling of the MSA/ARC (conical flare) stem has demonstrated better bone loading patterns compared to the Biodynamic™ design.

- The CFP stem is the current benchmark in clinical/surgical results for short curved neck-sparing stems.
Design Process

• Load the Neck- F.E.A., Conical Taper, Ti stem
• Determine Curve-Mueller, Thompson, Pipino
• Distal Stem Features - Sagital Slot, Lateral angle
• Modularity-CrCo neck, 8° and 12° varus/valgus, 12° anteversion
• Simplicity-5 sizes
• Choice of Bearing and Cup Options
• Instrumentation Compatible with Modern Approaches
Saves Bone compared to standard M/L taper stem design
Design Process

- Cadaver Studies
- In Vivo studies with instruments and trials
- 5 custom cases in Australia
- U.S. Approval-510K April 2010
- Manufacturer’s Limited Release
Tissue Sparing

Acetabular Considerations

In an effort to increase stability....

Do not compromise the Acetabulum

Do not over-ream to accommodate the next larger head

Large head diameter is no substitute for proper acetabular placement

Small women represent a challenge
Metal on Metal

another relative “contraindication”
Dual Mobility Cups
Surgical Technique

Level of Neck Resection

Angle of Neck Resection 50°

Rasping the Medial curve
Templating

AP helps determine neck level of resection
Lateral helps determine stem size

You don’t template like a conventional stem. This would be too tight. The distal stem is a pilot. A size #2 will ensure proper seating of the conical flair.

(Ideally AP film should be in Internal Rotation)
One tray simple and reproducible set of instruments
Surgical Technique
Posterior Approach
Anterior Approach
Saves more bone both medial and lateral
17 yr. old

youngest to-date  McPherson

12º
calagus
neck

Saturday, January 8, 2011
First stem
Sub cap A?P
Sub cap lateral
2 ½ year follow up

No distal reactive lines no sign of distal load transfer. Good medial curve contact slight rounding of medial neck and appearance of bone filling in gap at conical flare.