ARE SHORT STEMS SAFE

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Disclosure
• Consulting fees and royalties DJO surgical

WHY?
Short Stems

- Smaller approaches
- Shortened traditional designs
- Ease of insertion

Cementless Stem Fixation

Over 80% of US Total Hip Market is Cementless Femoral Fixation

Immediate Stability

- Short Term - Rapid Return to normal function
- Long Term - Biological stabilization
**Issues Facing Cementless Design**

- **Immediate**
  - Instability (subsidence, loosening)
  - Fracture (Greater Troch., Proximal Femur)
  - Dislocation
  - Excessive limb lengthening
- **Long-Term**
  - Stress-shielding
  - Wear / Osteolysis
  - Biocompatibility / Toxicity
  - Thigh pain

**What is the Purpose of a Stem? - Pro’s**

- Stability – frictional circumferential displacement of bone i.e. a nail in a piece of wood
- Initial fixation for non-cemented prostheses
- Alignment

**Consequences of using a Stem - Con’s**

- Stress shielding of proximal bone (20-40+% bone loss within 4 years of implantation)
- Distal transfer of load (diaphyseal hypertrophy)
- Stiffening of the proximal femur
- Non-physiologic loading of the diaphysis
- Thigh pain
- Potential for femoral fracture on insertion
Designs

- Neck sparing
- Standard
- Tapered
- Proximal fill

Evolution in Stem Design

- Metha Short Hip Stem
- Biopro Living Hip
- COLLO-MIS
- Taperloc Microplasty
- Short Modular Femoral
- Proxima Hip
- Arc
- Mayo Conservative Hip

Fitmore Prosthesis

- No revisions
- curved broaches and stems

Taperloc Microplasty

- 99% survival 5 years
- No subsidence
- No stress shielding lucencies

Short Metaphyseal Fitting Stem in Type C Bone

- 98% survival 7 years
- No thigh pain

Is Diaphyseal Stem Fixation Necessary for Primary Total Hip Arthroplasty in Patients with Osteoporotic Bone (Class C Bone)?

Micromax

- 2 year f/u 200 cases
- No subsidence
- No thigh pain

- Feto et al
Why Not

Poor Technique

It Can Happen To Anyone
SMF Short vs Synergy

- no difference outcome
- SMF increase varus/ values
- SMF increased subsidence


Varus Shift

TaperFill™ Tri-Taper™ Stem
Design Rationale:

- Unique Tri-Taper Design
  - ML driven by clinical history
  - AP driven by science
  - Key emphasis on initial stability and resistance to subsidence
- Reduced length for ease of implantation through minimally invasive surgical techniques

Implant Design: AP

- Dual AP Taper
  - 4° and 12°
  - Proximal fixation
  - Address subsidence

Implant Design: AP

- AP geometry driven by science
  - Bone model database used to determine appropriate fit
  - Cross sections at outer and inner cortical shell
  - Ansys simulation software used to assess contact and load
  - Ideal proximal fit and standard deviations drove dual tapers
1 year f/u 100 cases

- 98% survival
- 1 fracture
- 1 revision acute infection
dental abscess 6 months p/o
- no varus/valgus tilt
- no subsidence
- no thigh pain

61 Y/O MALE 6WK/1 Year

61 Laterals 6 wk / 1 Year
84 y/o female

84 y/o female lateral

Complicated Use
Femur malunion

Postop

Lateral
Technique Critical

- Attention to detail
- In some cases short stems are more difficult to insert
- Develop external cues- broach handle points to MFC

YES!

Thank You