"Early Learning Experience with a Neck Stabilized THA Stem for Treating Osteoarthritis"

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Purpose:

Total hip arthroplasty is one of the most effective orthopaedic procedures with a very high success rate as measured by pain relief, improved function and patient satisfaction. However, since the introduction of total hip arthroplasty in the 1940s, a range of design philosophies for femoral components have demonstrated variable clinical results. Aseptic loosening, joint dislocation, thigh pain, bone resorption and femoral component failure have been some of the complications that plagued this procedure. The past few years has seen an influx of so-called short stems with very little documentation as to design features, required surgical technique and long-term clinical outcomes. Most devices, meet with some level of learning curve and most surgeons do little in the way of warning new surgeons as to the perils and pitfalls during the initial surgical phase. This paper is designed to review the lessons learned during the first year of surgical experience with a new neck stabilized implant stem,1,2,3,4,5.

Why the need for a new design concept?

- Concerns with survivorship of young active patients (Kaplan-Meier 72% to 86% in patients <60 yrs. old)6
  - Dislocation of the hip
  - Infection of the hip replacement

Hips fail for a number of reasons:6,7,8,9

- More conservative approach
- Less inventory requirements
- More hard & soft tissue to work with for revision surgery
- More retrievable stems with retrieval surgery

• Concerns with Rising Health Care Cost
  - Hip replacements are expected to increase 174% in the next 20 years10
  - The number of patients waiting more than nine months for hip and knee replacements in North Wales has increased by 11,700%
  - Less inventory requirements
  - Less instruments

• Concerns with Retrieval and Conversion for Revisions
  - More hard & soft tissue to work with for revision surgery

Examples of failures of conventional THA

- Aggressive tissue reaction
- Removal of the implant
- Distracting to the surrounding bone (prosthetic fracture)

Results:

One year follow up on 200 cases by three surgeons at different centers. A novel tissue sparing neck stabilized stem design (ARC™ Neck Sparing) was used in all cases. Two surgeons used the anterior single incision and one surgeon used a small posterior surgical approach.

All were implanted with cementless acetabular components of four different designs and three different bearing surfaces. Intraoperative x-rays were taken on all patients undergoing the posterior approach and half of all anterior approach patients had intraoperative fluoroscopy or plain x-rays taken.

FIA studies were evaluated to determine best stem orientation and instrumentation designed and developed for surgical preparation of femoral stem.

Observations:

The initial year (April 2010 to April 2011) results of a novel modular neck sparing curved stem design clearly demonstrates that this approach can be used as a main stream treatment for the osteoarthritic patient.

The advantage of neck sparing stabilized stems saves tissue, both hard (bone) and softissue as compared to conventional cementless or short stem designs. This new approach has the potential benefit of less blood loss, quicker rehabilitation and if necessary easier removal and conversion of revision surgery. We are encouraged with our initial clinical / surgical impression and believe the potential advantages warrant further evaluation of this new approach to THA.

References: