EARLY EXPERIENCE WITH MSA™
NECK SPARING STEM
VIA ANTEROLATERAL APPROACH

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ACKNOWLEDGEMENT & FINANCIAL DISCLOSURES

1. The senior author Associate Professor A J van der Rijt holds shares in Global Orthopaedic Technology (GOT), the manufacturer of the MSA™ implant.

2. Many “Tissue Sparing Implant™” (TSI™) Study Group members have contributed to the development of this implant.
Design - Curved, short, neck loading femoral stem.

Proximal
- Trapezoidal, taper cross-section
- Proximal titanium/HA porous coating zone in femoral neck
- Torsional stability further enhanced by lateral “T” back
- Proximal conical flare transfers compressive loads to medial calcar

Proximal (Cremascoli taper)
1. Modular neck + head
   - Distal polished implant
Philosophy

Primary femoral implant fixation in the femoral neck results in:

– Load transfer to the femoral neck and proximal femur in torsion, axial and bending moments
– Sparing/preservation of bone and soft tissue
– Preserves proximal biomechanics, bone function (Wolff’s Law) and ultimately bone stock
– Femoral neck retention reduces torsional and bending moments (forces) at the bone stem interface.
MSA™ PATIENT SELECTION

39 year old male
Perthes Disease
SURGICAL APPROACH

Recommend surgeon use their routine operative approach

6
Anterolateral operative approach in obese patient
MSA™ FEMORAL NECK PRESERVING HIP ARTHROPLASTY

EARLY EXPERIENCE MSA™ STEM

- 59 hip arthroplasties (3 bilateral simultaneous, 1 bilateral sequential)
- 55 patients
- 54 patients Biolox Delta 36 ceramic
- 1 patient metal/metal
Patient demographics

- **Sex:** 45 male / 10 female
- **Age:** 27-73yrs  Average 52yrs
- **Weight:** 63-157kg  Average 84kg
- **Height:** 151-193cm  Average 174cm
- **BMI:** 22-45  Average 26
- **Side:** 28 left / 31 right
- **Disease**
  - OA 49
  - AVN 4
  - DDH 3
  - Perthes 2
  - #NOF 1
MSA™ FEMORAL NECK PRESERVING HIP ARTHROPLASTY

Follow up
Average 19 months
Range 3–32 months

Deceased 1
8 months post op (unrelated to hip)
6 month follow up, hip intact
MSA™ FEMORAL NECK PRESERVING HIP ARTHROPLASTY

EARLY RESULTS

- Intraop fracture – 1 (no. 41 – successful THR)
- Postop fracture – 0
- Infections (superficial/deep) – 0
- Dislocation – 0
- Thigh pain – 1 (? Back and leg pain – bone scan negative)
- Subsidence – 1 (7 months post op, sit up in bed – mild pain 6 weeks, resolved – XR ingrowth/stable)
- Leg length inequality issues – 0
- Revisions/reoperations – 0
- Lucent lines – 0
MSA™ FEMORAL NECK PRESERVING HIP ARTHROPLASTY

RESULTS
CALCAR BONE RESPONSE

Calcar resorption/lysis – 0
Insufficient time for response – 4
No response – 1
Subsidence/stabilised new calcar bone – 1
MSA™ FEMORAL NECK PRESERVING HIP ARTHROPLASTY

RESULTS
CALCAR BONE RESPONSE
Non progressive subsidence/stabilised

<table>
<thead>
<tr>
<th>Post-op</th>
<th>3 months</th>
<th>11 months</th>
<th>24 months</th>
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</thead>
<tbody>
<tr>
<td>Male</td>
<td>175cm</td>
<td>BMI 27</td>
<td>P/H Polymyalgial steroids</td>
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<tr>
<td>70 year old</td>
<td>72kg</td>
<td>BMD (L) NOF -3.65</td>
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MSA™ FEMORAL NECK PRESERVING HIP ARTHROPLASTY

RESULTS
CALCAR BONE RESPONSE

New bone proximal to the femoral neck osteotomy
53/59 hips
MSA™ FEMORAL NECK PRESERVING HIP ARTHROPLASTY

RESULTS

CALCAR BONE RESPONSE

Fine new trabecular bone up to conical flare

6 patients

Pre-op

Male
39 year old
179cm
81kg

6 weeks

BMI 25

13 months

13 months
MSA™ FEMORAL NECK PRESERVING HIP ARTHROPLASTY

RESULTS

CALCAR BONE RESPONSE

Dense new bone growing up to conical flare

24 patients

Male
62 year old

174cm
79kg

BMI 24
MSA™ FEMORAL NECK PRESERVING HIP ARTHROPLASTY

RESULTS
CALCAR BONE RESPONSE

New trabecular bone struts up to conical flare

14 patients

Male
60 year old
185cm
100kg
BMI 29
MSA™ FEMORAL NECK PRESERVING HIP ARTHROPLASTY

RESULTS

CALCAR BONE RESPONSE

Increased density calcar and new trabecular struts – 7 patients

<table>
<thead>
<tr>
<th>Post-op</th>
<th>6 weeks</th>
<th>13 months</th>
<th>13 months</th>
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<tbody>
<tr>
<td>Male</td>
<td>184cm</td>
<td>BMI 31</td>
<td>Bilateral simultaneous</td>
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<tr>
<td>49 year old</td>
<td>102kg</td>
<td>Marked stiffness</td>
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</table>

Male
49 year old
184cm
102kg
BMI 31
Marked stiffness
Bilateral simultaneous
MSA™ FEMORAL NECK PRESERVING HIP ARTHROPLASTY

RESULTS
CALCAR BONE RESPONSE

Increased density calcar, new trabecular struts ‘heterotopic’ bone proximal to conical flare – 2 patients

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<thead>
<tr>
<th></th>
<th>Post-op</th>
<th>4 weeks</th>
<th>3 months</th>
<th>24 months</th>
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<tbody>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>66 year old</td>
<td>187cm</td>
<td>105kg</td>
<td>BMI 30</td>
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MSA™ FEMORAL NECK PRESERVING HIP ARTHROPLASTY

6 weeks
Rally car driver
Polocrosse
“Had to have” a metal/metal hip
CONCLUSION

• The MSA™ implant did achieve stable fixation and ingrowth in the proximal femoral neck.

• Physiological load can be maintained in the femoral neck with retention of proximal femoral bone.

• Evidence of new bone formation and remodeling consistent with Wolff’s law.

• Physiological bone response implies long term ingrowth and stability of the femoral implant in the proximal femoral neck.
Thank you