

2013 E-Poster Metal Ion Levels in a Stable Modular Junction

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- Elevated blood/serum Co & Cr levels have been observed in some MOM THAs, resurfacings and modular neck THA systems.
- Sources of local tissue levels and circulating levels include bearing surface wear and fretting/corrosion from the trunnion or stem/neck junction.
- Adverse local tissue reaction (ALTR) and higher than expected revision rates have been reported with some implant designs.
- We report our experience with a modular neck THA component using a rigid stemneck junction design







Restoring motion. Renewing vitality.



Metal Ion Levels in a Stable Modular Junction

Materials / Methods:

Primary THA: Unilateral, staged or simultaneous bilateral Neck-sparing titanium stem & CoCr modular neck (ARC stem, OmniLife Science, Raytham MA USA)
Clinical, radiographic and laboratory studies
Serum or blood Co and Cr levels @ 1 yr post-op or later
54 patients including 5 bilateral; 18 male, 36 female
April 2010 to Oct 2012 ZONE 1 ZONE 7 ZONE 3,4 & 5

Neck Retention saves bone reduces both bending & torsional moments.



Metal Ion Levels in a Stable Modular Junction – Results:

Cobalt: 31 pts = nl; 20 pts = mild elevation; 3 pts = high levels; No ALTRs Chromium: 53 pts = nl; 1 pt very slightly elevated; No ALTRs

57% nl Co levels; 94% nl or mildly elevated; 98% nl Cr levels; no ALTRs

3/54 study pts with high Cobalt levels:

#1: Bilateral THA, Ox/Poly bearing, +12 and +8 head lengths, Co(B)=7.2#2: Bilateral THA, Alumina/Poly bearing, Co(B)= 6.0 (male pt)

#3: Unilateral THA, Alumina/Al bearing, Co(S)= 12.5

2 separate pts with CoCr levels after partial revision

#1: Head & neck exchange; sterile effusion 1yr later with new instability but normal CoCr levels; re-revised to monoblock stem

#2: Head and poly exchange for acute infxn; High Co(S) initially after exch with decreasing levels over 1 year ($27 \rightarrow 6.9$); recurrent infection without ALTR; 2 stage exchange



Metal Ion Levels in a Stable Modular Junction – Discussion

Normal or mildly elevated metal ion levels in >94% of primary THA pts.

No modular failures or ALTRs in this group.

Differential elevation of Co over Cr has been associated with modularity.

Subtle junction or trunnion design changes may have large effect on stresses.

Short necks (Neck Sparing), deep wells resulting in increased surface contact and engagement along the 'rounds' of the neck are associated w/ less stress & micromotion and less mechanically-assisted corrosion (MAC).

Modular systems provide benefit for reconstruction of non-standard anatomy, but design consideration are important to minimize corrosion risk.

