

Our experience with Metal-on-Metal articulation

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Metal-on-Metal articulation?

- What are we speaking about?

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Siwash's THR, 1959

Metal-Metal bearing

Re-introduce in 1988 by
Weber with a metal-on-metal
bearing of second generation

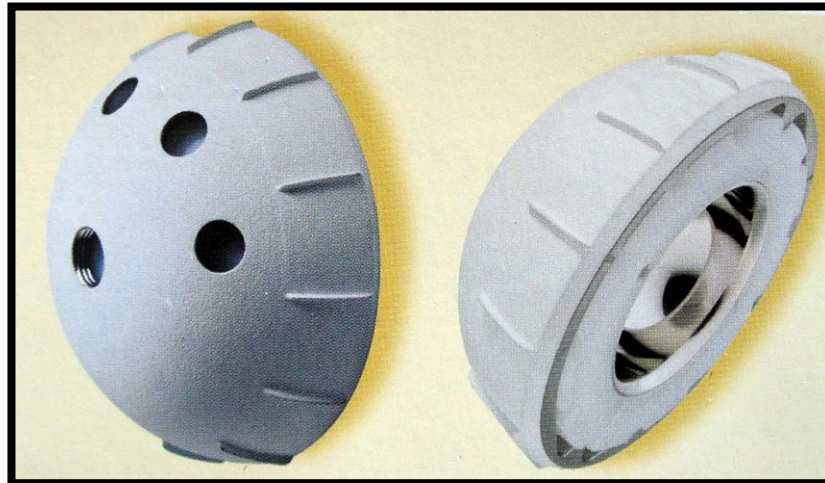
*Metasul[®] by Sulzer, high level of
carbon*

CoCr alloy ; [C] = 0.20 to 0.25%



Metal-Metal bearing

- Our choice
- Cedior cup, press-fit HA, unscrewed (Zimmer[®])



Metal-Metal bearing

- Our choice :
- Head Metasul diam. 28
- Stem Acora (Sulzer Medica[®])
cemented, cône 8/10.
- Tige Etoile (Zimmer[®]), cemented
since november 2000

QuickTime™ et un
décompresseur TIFF (non compressé)
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Metal-Metal bearing

- Metal-on-Metal is used in the department since 1999.
- Why this choice ?
 - Poor results with metal-on-PE arthroplasty in young patients under 50 years
 - Per operative difficulties when ceramic head breakage
 - New technology, challenge for University Hospital and clinical research.

Metal-Metal bearing

- **At this time**
- 1300 metal-on-metal articulations implanted.
- No implant revision for osteolysis or aseptic loosening caused by implant wear
- 18 implant revisions for sepsis, 7 for early mobilisation of the cup, and few for dislocations

Metal-Metal bearing

- **BUT**
- What's happen with high serum levels of metal ions
- Poor results with cemented cup Metasul under 48 mm diameter at 5 years follow up (Levai, Augererau)
- And finally with JY Lazennec's research

Metal-Metal bearing

- **Materials and methods:**
- Retrospective serie,
- Clinical results (Harris score)
- X rays standart
- TDM reconstruction
- Value of serum metal ions

Clinical results

- 126 patients (140 hips) at mean 7 years follow up.
- 86 males, 40 females
- Mean age of 42 years (29 to 49 years old)
- Clinical results
 - PMA : 17.2
 - Harris : 96
 - Normal life, until re-operation

Radiographic results

- M. Ak.
- 38 years old, ONA
- FU: 7 years 6 months
- PMA: 18
- Harris: 100
- Cr: 2,78 Co: 1,86 $\mu\text{g/L}$

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Radiographic results

- M. Ca.
- 44 years old, Osteoarthr
- FU : 7 years, 10 months
- PMA : 17
- Cr: 2.44 Co: 1.40 $\mu\text{g/L}$

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TDM results

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QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

Serum Co and Cr levels

- Serum levels of Co, Cr and Ti
- Laboratory hôpital Lariboisière, Paris, Dr Poupon.
- Measurements were made by atomic absorption spectrometry
- Brodner, JBJS, B-79, 1997 : Co < 5 $\mu\text{g/L}$

Dosages sanguins

| | Ch. | Lh. | Le. | Pa. | Ak. | Ca. | Du. | Da. | Zu. | Fl. |
|----|------|------|------|------|------|------|------|------|------|------|
| Co | 1.78 | 1.55 | 0.62 | 2.32 | 2.78 | 2.44 | 2.45 | 1.67 | 2.75 | 1.89 |
| Cr | 2.03 | 1.76 | 1.03 | 2.30 | 1.86 | 1.40 | 2.38 | 1.56 | 2.07 | 2.14 |
| Ti | <1.4 | <1.4 | <1.4 | <1.4 | <1.4 | <1.4 | <1.4 | <1.4 | <1.4 | <1.4 |

Brodner et al., JBJS-B79, 1997. NI < 5 µg/L

Failure of metal-on-metal articulations

- Low level of Carbon (% carbon)
- Cemented cup Metasul with diameter under 50 mm
- “Impingement” between the cup and sleeved head



Failure metal-on-metal articulation



Dr Christian Delaunay

Conclusions

- Retrospective serie
- Patients under 50 years
- Follow up : at least 7 years
- At this time with 7 years follow up, metal-on-metal articulations with Metasul is steel the best bearing.

We think Metasul articulation with Durom cup, large diameter, and a cementless stem like the Avenir is probably the best we can do for our patients

Conclusions

- "Au point de perfection qu'atteint aujourd'hui la science, il est peu probable que de grandes découvertes restent encore à faire."

François Arago, 1848

Polytechnicien, astrophysicien et ministre de la guerre

Thank you for your attention