Interest of tantalum for arthrodesis-reconstruction of TAR revision: preliminary results in 11 cases

Jean-Luc BESSE,
Sylvain AUBRET
Marie-Caroline LOMBERGET-DAUBIE,
Michel-Henry FESSY
Interest of tantalum for arthrodesis-reconstruction of TAR revision: preliminary results in 11 cases

Jean-Luc BESSE, MD PhD
Sylvain AUBRET
Marie-Caroline LOMBERGET-DAUBIE, MD
Michel-Henry FESSY, MD PhD, Pr.

Authors have no potential conflicts with this presentation
TAR survivorship at 10 yr from 70% to 90% \( (Easley\ 2011) \)

But periprosthetic osteolysis + implant subsidence = problem +++

Revision of TAR = surgical challenge

- Revision surgery is difficult due to bone defect
- Arthrodesis needs massive graft
  - Autograft: but not enough bone
  - and / or Allograft: requiring long period of non-WB

We propose an original approach using tantalum

Tantalum is used as spacer to fill the defect and reinforce arthrodesis
Trabecular metal

- Composition: 98% Tantalum
- High porosity
- Low modulus of elasticity similar to cancellous bone
- Excellent biocompatibility, and biologic integration

Zimmer trabecular ankle interpositional spacer™

5 Heights: 7.5 - 25 - 30 - 35 - 40 mm

3 Sizes: small - medium - large
MATERIAL and METHOD

- 11 patients underwent TAR revision *(Oct 2013 to Sept 2015)*
- 7 AES®, 2 Hintegra®, 1 Salto®, 1 Albatros®
- Operated on by one senior orthopedic surgeon (JLB)

<table>
<thead>
<tr>
<th>Series</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>n=</td>
<td>11</td>
</tr>
<tr>
<td>Gender</td>
<td>5♀ / 6♂</td>
</tr>
<tr>
<td>Age at TAR</td>
<td>53.2 y ±14.6 [37-82]</td>
</tr>
<tr>
<td>Age at revision</td>
<td>66.6 y [41-90]</td>
</tr>
<tr>
<td>TAR to revision interval</td>
<td>7.2 y [2-12]</td>
</tr>
<tr>
<td>BMI</td>
<td>24.8 ± 4.1 [18.8-34]</td>
</tr>
<tr>
<td>Etiologies</td>
<td>4 post-trauma, 4 laxity, 3 primitive OA</td>
</tr>
</tbody>
</table>

[5]
Surgical techniques

10 tibio-talo-calcaneal arthrodeses
1 ankle arthrodesis

1. Remove TAR
2. Cyst Curettage
3. Defect assessment
4. Tantalum used to fill defect and reinforce arthrodesis
5. Associated to autograft
   - Posterior crest n=2
   - Now, iliac wing n= 9

6. Osteosynthesis
   - 1 anterior plate (Tibiaxys™) + screws (Ankle arthrodesis)
   - 10 retrograde angulated nail : 611 AFN™ (TTC arthrodesis)
RESULTS

- Surgery was difficult
  - Needed long time (2h30 to 4h30) and Fluoroscopy

- Postoperative care
  - 6 weeks without WB
  - Then 2 months of WB with boots
  - X ray: 1.5 - 4 - 12 months
  - CT scan: 6 ms and 1y

- COMPLICATIONS
  - 1 minor delay of wound healing (up to 3 months)
  - 1 superficial infection (diabetic patient) managed by infectiologist (4 mo antibiotics)
 RESULTS

- FU 13.5 mo (8 - 30 mo)

- Functional results
  - 1 loss to FU
  - 6 good results
  - 4 severe residual pain

- Radiological assessment (6 mo and/or 1yr)
  - Xray: 100% fusion
  - CT scan: 100% fusion for ankle
doubt for ST fusion (2 cases)

but difficult to assess ankle fusion on CT (artefacts due to tantalum)
"Unexplained" residual severe pain: 4 cases ( = 40%)

Hyperactivity on bone scan with Spect-CT

- Non-union ?
- Impingement between locking-screw and Tantalum ?

Recently: Retrograde nail removal in 3 cases

Ankle arthrodesis non-union

+ Tantalum non-integration (2 cases)
CONCLUSIONS

- Interest of tantalum for revision of TAR
  - as spacer to fill defect
  - Allows primary stability of reconstruction
  - Used with plate or retrograde nail for ankle or TTC arthrodesis
  - Surrounded by autograft

- Could be problem if secondary infection

- Need longer F-U to analyse integration and fusion

  - Doubt on real integration of Tantalum

  - Is it better than titanium?

  - I hesitate to continue with this option
Use of Tantalum (in foot and ankle surgery)

- Bouchard (2004): first publication (tarsometatarsal arthrodesis)
- Economopoulos (2010): distal tibia reconstruction (giant cell tumor)
- Frigg (2010): 1 TAR revision (TM block + screw + External Fixation)
- Henricson (2010): 13 TAR revision (nail+ spacer)
- Sagherian (2012): 27 ankle and hindfoot arthrodeses (2 TAR)
- Sagherian (2015): 3 TAR revision (TM block + plate)
- Papadelis (2015): 18 Sub-talar arthrodeses (TM block)