

Interest of Tantalum for Arthrodesis-Reconstruction of TAR Revision: Preliminary Results in 11 Cases

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Introduction/Purpose: Ten-year Total Ankle Replacement (TAR) survivorship improved from 80 to 90%. But periprosthetic osteolysis associated with implant subsidence remains the main problem, with difficult revision surgery by arthrodesis; bone defect requiring massive graft. We proposed an original approach using porous tantalum as spacer to fill the defect and reinforce arthrodesis-reconstruction

Methods: From October 2013 to September 2015, eleven patients underwent TAR revision (7 AES TM, 2 Hintegra TM, 1 Salto TM, 1 Albatros TM) by ten TTC arthrodesis and one ankle arthrodesis using tantalum (with Zimmer Trabecular Metal Ankle Interpositional SpacerTM introduced in July 2013). All patients were followed up prospectively clinically and radiologically (X-rays and CT scan at 4-6 months, and 1 year); and a bone scan with SPECT- CT if residual pain at one year.

Mean age was 53.2 yrs [37-82yrs] at TAR, 66.6 yrs [41-90 yrs] at revision-arthrodesis, with a mean interval of 7.2 yrs [2-12yrs].

Results: We used a tantalum cone (25-40mm height) and osteosynthesis by a retrograde nail in 10 TTC arthrodesis cases (Tornier-AFN611 TM, 10 or 12 mm diameter, 6° or 11° lateral angulation) associated or not to a complementary anterior sub-talar screw (Unima-BiotechTM 4.5mm), and a double anterior plate in one ankle arthrodesis case. Tantalum implants were surrounded by autologous bone graft (1 posterior iliac crest, 10 iliac wing harvested with hip reamers) mixed with Lyophilized fragmented Human Bone. Postoperatively, patients were 6 weeks without weight-bearing, followed by 2 months of boot with weight-bearing.

At a mean 1 year follow-up (4 -18 mo), ankle fusion was confirmed on CT in all cases but with doubt for 2 cases. But there remained three case of unexplained residual severe pain associated with hyperactivity on bone scan: incomplete fusion (difficult to assess on CT due to tantalum)? impingement between locking-screws and Tantalum?

Conclusion: Porous tantalum had biological and biomechanical properties close to those of natural bone. The use of Trabecular MetalTM in hip, knee, spine surgery recently demonstrated efficacy; but there are few recent publications in TAR revision. Our preliminary results are encouraging; tantalum allows primary stability of reconstruction. Is it better than Titanium cages? We need longer follow-up to analyze integration and fusion; and to check the residual pain in some cases.

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