Minimal Invasive Technique of Total Ankle Replacement

Presenting:

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Summary:
30 Minimal-invasive procedures of TAR were performed from 6/07 to 12/08. A MIS-TAR is a fundamental possibility if a critical indication will be used. This new technique can be performed with a low complication rate and with good functional results. Despite a high personal experience in TAR in general there is still an additional learning curve necessary. Longer operative time, longer tourniquet time and a higher exposition of intra-operative x-ray control have to take into consideration in that period.

Introduction:
Total ankle replacement (TAR) is quite established in these days, but there is still a high cumulative complication rate. Especially soft tissue problems up to 29% in meta-analysis reduce the reachable functional result. That's why the possibility of a minimal-invasive procedure of a total ankle replacement was evaluated in a clinical prospective investigation.

Methods:
Indication: ankle arthritis (modified Kellgren-Grade 4 and 5);
Contraindication: pre-existing scar tissue or soft tissue lesions in front of the ankle joint;
Period of investigation: 06/2007 – 12/2008;
Clients: 30 patients with 30 Minimal-invasive Surgery (MIS) procedures;
Age of the patients: 63 (43-85);
Clinical and radiological evaluation: postoperative 6 and 12 weeks / 1 year.

Operative Technique:
Own definition of a MIS-TAR was a short median approach with a skin incision of 5-6 cm and following operative criteria:
• No touch of subcutaneous venous vessels – where ever possibly and without soft tissue dissection
• No stripping of the superficial peroneal nerve
• Leave the Tibialis anterior tendon complete in his own tendon sheet
• No subperiosteal preparation of the bone at all
• Exploration of the ankle situs in „moving windows technique“ - it means without continuous soft tissue distraction or use of a spreader
• Percutaneous fixation of the aiming cutting device with fluoroscoping control
• Resection of the dorsal bone parts in „bit-by-bit-technique"
• Cement less press-fit implantation of the TAR
• Functional aftercare

Results:
All 30 intended TAR (with above-mentioned indication) could be successfully performed with this new technique. Only twice longer incisions (+1 cm longer) were necessary. But in the same time period (see above) were 142 conventional TAR performed due to existing deformities etc. The average OP-time was 126 min., the average time of fluoroscopy control was 16 sec. and the average tourniquet time was 29 min.
There were only 2 MIS-associated complications of (partial) extensor hallucis tendon lesions in the first 10 cases. All TAR were radiologically consolidated after 6 weeks. All patients were very satisfied with the cosmetic result and showed a good function of the ankle joint with an average motion of 47° (selective ROM of the ankle joint were assessed with the image intensifier). The X-ray evaluation showed a good TAR position in all cases without loosening, subsidence or heterotopic peri-articular ossifications.

**Conclusion:**
The MIS-TAR is an additional option in the treatment of severe ankle arthritis. Up to this date there are only our short-term results available that's why a critical analysis of mid- and long-term results are necessary until before a fundamental statement can be given.