Complications, Reoperations, and Postoperative Outcomes of Simultaneous Supramalleolar Osteotomy and Total Ankle Replacement in Misaligned Osteoarthritic Ankles in Comparison to Total Ankle Replacement Alone

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Introduction/Purpose: A key for success in total ankle replacement (TAR) is a balanced ankle joint with a physiological loading of the implant, minimizing the wear of the polyethylene insert. Theoretically, in ankles with distal tibial deformities, this can be achieved with a correcting tibial resection cut. As an alternative, supramalleolar osteotomy (SMOT) can be used for balancing the ankle during TAR surgery. To date, however, no data exist whether a SMOT in addition to TAR results in better outcome over time, and which are the additional risks with such extensive surgery.
The aim of the study was therefore 1) to determine the risk of a simultaneously performed SMOT in comparison to TAR only, and 2) to compare the postoperative clinical outcomes.

Methods: Between 2002 and 2014, 23 patients (male, 12; female, 11; mean age 60 [22-72] years) underwent simultaneously a SMOT and a TAR for treatment of a severe misaligned osteoarthritic ankle (tibial anterior surface angle [TAS] <84° [n=9] or >96° [n=1], or tibial lateral surface angle [TLS] <70° [n=13]) (SMOT&TAR group). Statistical matching was applied to extract a subgroup out of 510 TAR patients from our prospectively collected database with the same baseline characteristics, including similar preoperative alignments (control group). The matched 23 TAR patients (male, 16; female, 7; mean age 58 [35 - 79] years) were compared regarding additional procedures, complications and reoperations. Pre- and postoperative alignment measured on radiographs and clinical outcome (range of motion [ROM], pain on the visual analogue scale [VAS] and AOFAS hindfoot score) were compared.

Results: While more additional osteotomies were done in the SMOT&TAR group (calcaneus, 5:1; fibula, 7:1), more ligament reconstructions and tendon transfers were done in control group (ligament reconstruction, 0:6; tendon transfer, 0:6). There was no difference, neither in the complication rate nor in the reoperation rate between both groups. However, there was a tendency of instability, subsequent polyethylene wear and cyst formation in the TAR group. The postoperative TAS was closer to neutral in the SMOT&TAR (pre- to postoperatively: 82.9° to 90.4° vs. 82.6° to 87.8°). While ROM was lower in the SMOT&TAR (30°) than in the TAR group (39°) (p=0.01), there was no difference in the clinical outcome (VAS pain 1.2 vs. 1.5 [p=0.58], AOFAS score 82 vs. 82 [p=0.99]).

Conclusion: A SMOT performed simultaneously with TAR for the treatment of a severely deformed ankle resulted in a more neutral and better balanced ankle, and it was not associated with a greater risk of complications or reoperations. The only disadvantage was a slightly smaller ROM. Thus, SMOT should be considered in TAR with greater hindfoot deformities at the distal tibia as it is more powerful to address deforming forces. As shown, SMOT and TAR can be done simultaneously without taking greater risks.

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