

Publication

Changes of density distribution of the subchondral bone plate after supramalleolar osteotomy for valgus ankle osteoarthritis

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4406222**Author(s)** Egloff, Christian; Paul, Jochen; Pagenstert, Geert; Vavken, Patrick; Hintermann, Beat; Valderrabano, Victor; Müller-Gerbl, Magdalena**Author(s) at UniBasel** [Müller-Gerbl, Magdalena](#) ;**Year** 2014**Title** Changes of density distribution of the subchondral bone plate after supramalleolar osteotomy for valgus ankle osteoarthritis**Journal** Journal of orthopaedic research : official publication of the Orthopaedic Research Society**Volume** 32**Number** 10**Pages / Article-Number** 1356-61**Keywords** Absorptiometry, Photon; Adult; Aged; *Bone Density; *Calcification, Physiologic; Female; Humans; Male; Middle Aged; Osteoarthritis/*surgery; Osteotomy; Retrospective Studies; Talus/diagnostic imaging/*physiology; Tibia/diagnostic imaging/*physiology; Young Adult; Ct-oam; supramalleolar osteotomy; valgus ankle osteoarthritis**Mesh terms** Absorptiometry, Photon; Adult; Aged; Bone Density; Calcification, Physiologic; Female; Humans; Male; Middle Aged; Osteoarthritis, surgery; Osteotomy; Retrospective Studies; Talus, physiology; Tibia, physiology; Young Adult

CT-osteosorptiometry (CT-OAM) has been used to visualize subchondral bone plate density distribution regarding to its mineralization. The purpose of this study was to display and analyze the density distribution of the subchondral bone plate before and after supramalleolar realignment osteotomies. We retrospectively analysed pre- and postoperative CT images of nine consecutive patients with post-traumatic unilateral valgus ankle OA. The distribution charts of CT-OAM scans were quantitatively analyzed for subchondral bone plate density distribution. VAS for pain and the Tegner activity scale were used to assess clinical outcome. At a mean follow-up of 20 +/- 5.6 months (range 13-27), we observed a significant pre- to postoperative decrease of the mean high-density area ratio in tibia (lateral and posterior area) ($p \geq 0.05$) and the talus (lateral area) ($p \geq 0.05$). Pairwise comparison between the pre- and postoperative mineralization at the articular surface showed a significant decrease of the high-density area ratio for the tibia and the talus. The VAS decreased from 6.2 +/- 0.9 pre- to 2.8 +/- 0.9 postoperatively ($p = 0.027$), and the Tegner score inclined from 4.5 +/- 1.1 preoperatively to 5.3 +/- 0.7 after surgery ($p = 0.082$). The tibial and talar subchondral bone plate density, regarding to its mineralization, decreased after supramalleolar medial closing wedge osteotomy in patients with valgus ankle OA. The results of this study suggest that realignment surgery may decrease peak bone density areas corresponding to the alignment correction and contribute to a homogenization of the subchondral bone plate mineralization.

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