

## Publication

### Assessing in vivo articular cartilage mechanosensitivity as outcome of high tibial osteotomy in patients with medial compartment osteoarthritis: experimental protocol

#### **JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**

**ID** 4600373

**Author(s)** Mündermann, Annegret; Vach, Werner; Pagenstert, Geert; Egloff, Christian; Nüesch, Corina

**Author(s) at UniBasel** [Vach, Werner](#) ; [Pagenstert, Geert](#) ; [Egloff, Christian](#) ; [Nüesch, Corina](#) ; [Mündermann, Annegret](#) ;

**Year** 2020

**Title** Assessing in vivo articular cartilage mechanosensitivity as outcome of high tibial osteotomy in patients with medial compartment osteoarthritis: experimental protocol

**Journal** Osteoarthritis and Cartilage Open

**Volume** 2

**Number** 2

**Pages / Article-Number** 100043

**Keywords** Knee osteoarthritis, High tibial osteotomy, Knee adduction moment, Walking stress test, BiomarkersIn vivo

**Objective** To propose an experimental protocol for using high tibial osteotomy (HTO) as a model for studying in vivo biological effects of large permanent changes in ambulatory load. **Design** This study is a prospective multimodal (clinical, biomechanical, biological) data collection without randomization. The study will examine a cohort of 40 patients with medial compartment knee OA undergoing opening wedge HTO. **Experimental protocol** Before planned HTO, patients will be clinically assessed (including mechanical axis measurement from radiographs) and complete questionnaires on physical function. Patients will complete a walking stress test with blood sampling (30 min walking, 5.5 h sitting), and undergo gait analysis. Six weeks after HTO (at the time of full weight bearing), the mechanical axis will be measured from radiographs. Patients will complete the questionnaires and a walking stress test with blood sampling, and undergo gait analysis 6 months after HTO. The peak external knee adduction moment, knee external knee adduction moment impulse and peak external knee flexion moment will be used as surrogates of ambulatory load. Load-induced changes in cartilage biomarkers will be used as surrogates of metabolic changes in response to ambulatory load. At the 12-month follow-up, subjects will complete the questionnaires. **Conclusion** The results of this study can be considered as proof-of-concept of a potential diagnostic test (walking stress test) for cartilage degeneration and its prognostic value. A direct relationship between ambulatory load and cartilage metabolism assessed as degradation to synthesis ratio would allow developing novel load-modifying interventions and evaluating the efficacy of existing interventions.

**Publisher** Elsevier

**ISSN/ISBN** 2665-9131

**URL** <https://www.sciencedirect.com/science/article/pii/S2665913120300273>

**edoc-URL** <https://edoc.unibas.ch/77807/>

**Full Text on edoc** Available;

**Digital Object Identifier DOI** 10.1016/j.ocarto.2020.100043