Differences of morphological parameters between the two sides of a worn tibial plateau examined by micro-computed tomography

Supervision: dr. ir. B. van Rietbergen

ABSTRACT
Arthrosis, which is caused by normal wear of the joints, is the most common joint disease in adults. Diagnosis in early stages of wear of the knee joint would contribute to early treatment methods and consequently a better prognosis for those patients. In this study, 20 tibial plateaus were retrieved from total knee replacing surgeries. Two volumes of interest were selected in each tibial plateau. In addition, both sides of the tibial plateaus had one volume of interest selected. A splitting parameter created two groups: one group with the most worn tibial plateau sides, the other group with the less worn tibial plateau sides. Based on this splitting parameter, differences between the two groups in morphological parameters were measured. The difference of the splitting parameter, BV/TV, between both groups was significant. Moreover, the sides with the larger BV/TV had a significantly larger trabecular thickness and Mean/Density of TV. In the contrary, the Structure Model Index and trabecular separation were significantly smaller in the sides with the larger BV/TV, which were assumed to be the more worn sides.

Microarchitecture of two volumes of interest within the tibial plateau, using micro-computed tomography