第 221 回 Bone Biology Seminar

演題 "TEXTURE ANALYSIS IN QUANTITATIVE

OSTEOPOROSIS ASSESSMENT:

SEGMENTATION AND CHARACTERIZING
 MICROARCHITECTURE"

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抄録

Currently, the assessment of osteoporosis is mainly based on bone mineral density (BMD) measurement as assessed by dual-energy x-ray absorptiometry (DEXA). DEXA measurements cannot distinguish between the separate contributions of cortical and trabecular bone, or assess 3-dimensional geometry and microarchitecture.The microarchitecture of the trabecular bone is an highly informative feature for osteoporosis assessment. High resolution peripheral quantitative computed tomography (HR-pQCT) permits its in-vivo observation at a resolution of 82 μ m. We propose an approach that assesses bone microarchitecture based on texture features extracted from the trabecular bone. The method is based on three-dimensional texture features as local descriptors of the structure in the trabecular bone. A clustering in the feature space indicates characteristic classes of microarchitecture that are repeatedly detected across subjects. The distribution of those classes allows for a differentiation between osteoporotic and healthy subjects. We report initial results for the repeatability of the method and its performance for the differentiation of healthy and osteoporotic subjects. Experiments also show that the we can achieve a threshold-independent segmentation of cortical and trabecular compartment by using texture analysis approach. It outperforms the state of the art methods in terms of bias and accuracy. This results in reliable thickness measurements, and provides an accurate basis for the study of the transitionary zone between cortical and cancellous bone.
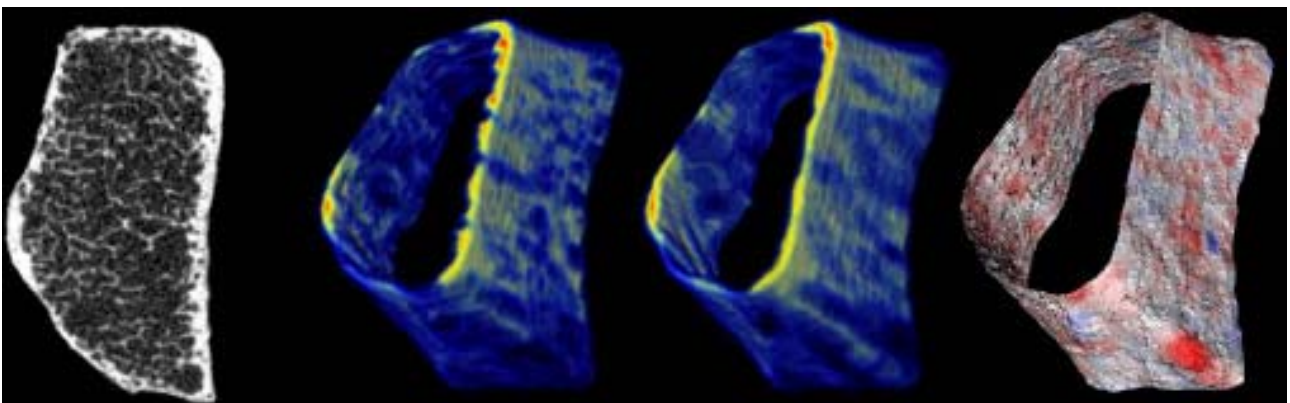
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