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### ASSESSMENT OF ABDOMINAL FAT BY QCT

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The relationship between adipose tissue and bone mineral density (BMD) is still being debated. The purpose of our study was to evaluate whether the pattern of abdomen adipose tissue is correlated to trabecular BMD of the lumbar spine. In this cross-sectional study, we studied 89 premenopausal and 231 postmenopausal Chinese women aged 19–86 years. Quantitative computed tomography (QCT) was used to measure the average trabecular BMD of L2–L4, visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT). Height and weight were measured. In the premenopausal sample, multiple linear regression analyses indicated that VAT was negatively correlated to trabecular BMD ($P$ value = 0.0003) and SAT had no correlation to trabecular BMD. In contrast, there was no significant correlation between VAT and BMD or SAT and BMD in the postmenopausal sample. Our results indicate that VAT may be deleterious to trabecular BMD and SAT has no correlation with BMD in the premenopausal Chinese women, and there is no correlation between abdominal adipose tissue and trabecular BMD in the postmenopausal Chinese women.

**Brief CV**
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### MUSCLE ANALYSIS USING HR-PQCT, DXA AND MRI

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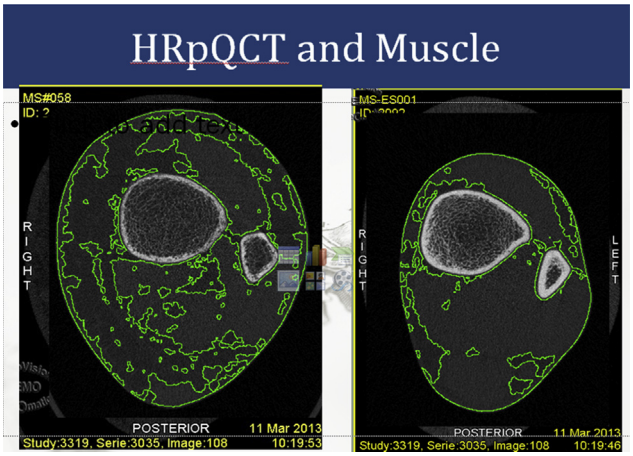
Sarcopenia is the age-related loss of muscle mass, strength and function. Sarcopenia and osteoporosis may commonly co-exist in older adults. Currently, there is no standardized measure of age-related muscle loss over time. Physical performance measures and measures of muscle strength and function are limited by day to day variability, joint pain, poor sleep, depressed mood, and effort. Muscle biopsy is an objective measure of muscle properties, but is an invasive and painful procedure. Musculoskeletal imaging has the potential to advance our ability to objectively and non-invasively study changes in muscle with aging, as well as the response of the muscular system to targeted intervention. Here we will explore using DXA, pQCT, HRpQCT and MRI as tools for objective assessments of muscle mass, and will correlate these parameters to muscle strength and function. We will discuss technical challenges and the need for further research.




### MRI FOR MARROW FAT ASSESSMENT IN BONE METABOLIC DISORDERS

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The confined space of the medullary cavity of bone is filled with trabecular bone (<20%) and bone marrow (>80%). Bone marrow is comprised of fatty marrow and functioning (red) marrow (comprising red blood cells, platelets, lymphocytes, plasma cells and their pre-cursors). An increase in one component of the medullary canal can only occur at the expense of another component. Lifelong changes which occur in the volume of trabecular bone are relatively small compared to those which occur in fatty or red marrow. Marrow fat content increases throughout life from about 20% marrow fat content at 20 years of age to about 60% marrow fat content at 60 years of age. This fat content can be accurately quantified with MR spectroscopy using the fat: water ratio with high reliability. An alternative method is in-phase:out-phase imaging (Dixon technique) though this does not provide spectroscopic detail. In men, marrow fat content is generally about 10% higher than in females, though around the time of the menopause there is a dramatic increase in marrow fat content in females such that after this time, marrow fat content is about 10% higher in females. Marrow fat content increases but what about marrow fat composition — does that change with increasing age or change in BMD. Marrow fat contains both saturated and unsaturated fat and at least 22 different fatty acids. Current clinical MR spectroscopy has the ability to measure the unsaturated and saturated components of marrow fat with the potential for providing near-complete non-invasive spectroscopic detail. Some studies suggest that there is a change in fat composition with osteoporosis, a highly relevant finding since some fats can inhibit bone metabolism in vivo. Studies have begun to look at marrow fat and its