
Proceedings Paper:
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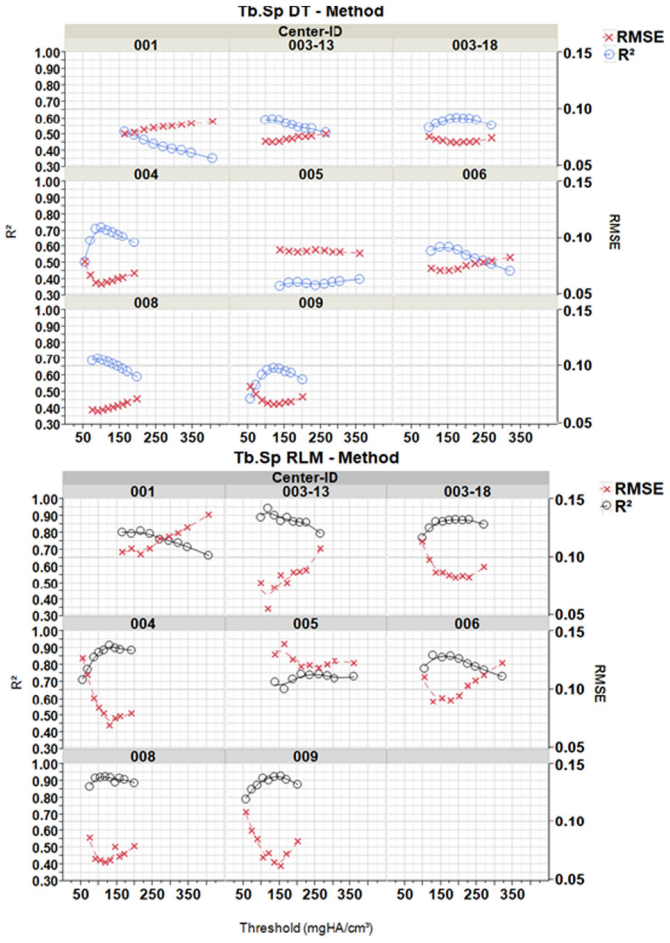
However, the R^2 values differed markedly with (0.402-0.719) for DT and (0.747-0.926) for RLM. Noticeably, only for some CT-centers an optimum threshold setting was observed.

Conclusion(s): The RLM method may show advantages over DT when structures like Tb.Bone are imaged with limited spatial-resolution and high image-noise. Further tests need to be performed to verify our observations and applications on patient data need to be done.



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P018

Development and external validation of nomograms for predicting one-year mortality and walking ability of Asian elderly femoral neck fracture patients after arthroplasty

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Background/Introduction: Femoral neck fractures are common in Asian elderly patients and related to high risk of mortality and walking ability impairment after hip arthroplasty. Simplified prognosis predicting models are strongly needed for preoperative clinical decision-making.

Purpose: The purpose of the present study was to create preoperative patient-specific factors-based nomograms for predicting mortality and walking ability of Asian elderly femoral neck fracture patients 1 year after arthroplasty.

Methods: Data of patients > 65 years who underwent primary unilateral hemiarthroplasty or total hip arthroplasty due to femoral neck fracture between January 1st, 2012 and June 30th, 2019 in our center were collected. Candidate variables included demographic data, comorbidities, and preoperative screening. Main outcomes included mortality and walking ability in the 1st postoperative year. Patients were randomly divided into derivation and validation groups. Nomograms were developed based on multiple logistic regressions of derivation group via R language. 1000 bootstraps were used for internal validation. Those models were further tested in the validation group and the entire data set.

Results: The final analysis was performed on 702 patients after screening. All-cause mortality one year after arthroplasty of the entire data set was 23.4%, while the independent walking rate was 74.4%. Age and preoperative walking ability showed the biggest impact on mortality and postoperative walking ability, respectively. The bias-corrected C index for predicting mortality in derivation group and the entire dataset were 0.717 and 0.712, while they were 0.754 and 0.733 for predicting walking ability impairment.

Conclusion(s): Our models enabled one-year mortality and walking ability predictions in Asian elderly femoral neck fracture patients with adequate predictive discrimination and calibration. Those models are helpful for surgeons in identifying high-risk patients and fulfilling rapid assessment before surgery.

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P116

Trabecular bone structure in advanced chronic kidney disease: Comparison of bone biopsy assessment using microCT and histomorphometry

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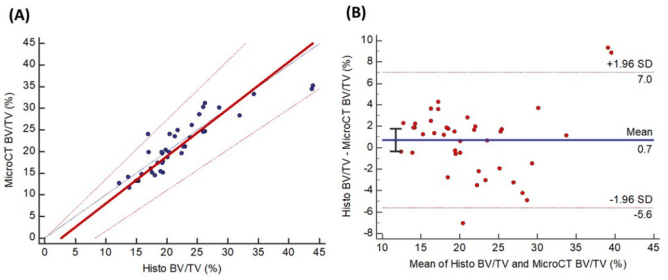
Background/Introduction: Fracture risk is increased in advanced chronic kidney disease (CKD) patients due to bone abnormalities of renal osteodystrophy and osteoporosis. Bone biopsy is recommended before commencement of anti-resorptive therapy to assess bone turnover, mineralization and volume. MicroCT can assess bone volume and structure in bone biopsy samples quicker than quantitative histomorphometry.

Purpose: We aimed to assess if microCT and histomorphometry methods are interchangeable for trabecular bone volume and structure assessment of bone biopsy in advanced CKD.

Methods: 40 CKD stages 4-5D patients had trans-iliac bone biopsy using a 4mm diameter Jamshidi trephine. The bone biopsy core was scanned at 4.3μm resolution using the Skyscan MicroCT for assessment of trabecular bone volume/tissue volume (BV/TV) and structure. Then quantitative histomorphometry was performed using the Bioquant system. Normal mineralization was defined as osteoid thickness < 20μm. Methods comparison analysis was performed using the Passing-Bablok regression analysis and the Bland-Altman plot. The study was approved by the local ethics committee.

Results: All patients had normal mineralization status. The two methods showed good agreement for trabecular BV/TV assessment (Figure A). There was a mean of 0.7% (95% CI -0.33 to 1.74) underestimation of BV/TV by microCT (Figure B). The two methods also showed good agreement for measurements of trabecular thickness but not for trabecular number. There was a mean of 0.7% (95% CI -3.79 to 5.20) underestimation of trabecular thickness measurement by microCT.



(A) Passing-Bablock regression equation: MicroCT BV/TV = -3.13 + 1.10 (Histo BV/TV)
Intercept (95% CI) = -3.13 (-8.01 to -0.22) *Both methods differ by this constant amount*
Slope (95% CI) = 1.10 (0.95 to 1.37) *No proportional difference between the two methods*
Cusum test of linearity p=0.53. *No significant deviation from linearity*
(B) Bland-Altman plot: no bias

Conclusion(s): MicroCT and histomorphometry are interchangeable for trabecular bone volume and trabecular thickness assessments in advanced CKD patients with normal mineralization status.

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P147

Association between trabecular bone score and sleep patterns: Findings from a cohort study

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Background/Introduction: Sleep is a vital biological process involved in the regulation of a variety of metabolic and endocrine functions, including bone health. Previous studies have reported an association between sleep (duration and quality) and BMD in women, but findings remaining conflicting.

Purpose: Investigate the relationship between sleep quality, sleep duration and trabecular bone score (TBS) in a general population of elderly adults.

Methods: Study comprised participants from a population-based cohort of elderly individuals. During the visit at the research center, the participants underwent DXA assessment from which TBS from the lumbar spine was estimated. Sleep quality was assessed through the PSQI (Pittsburgh Sleep Quality Index), a self-rated 19- item questionnaire, which was filled out with the help of a research nurse. To test the association between all the sleep parameters and TBS we ran linear regression analyses adjusted for age, sex, cohort effect, BMI, education level, cholesterol levels, diabetes, alcohol use, depression symptoms, smoking status, history of cardiovascular disease. [FK1] We tested for interaction between sleep parameters and all covariates, and thereafter stratified the analysis for presence of depression symptoms.

Results: Among 5,534 individuals, 58.1% were women with a mean age of 66 years and sleep duration of 6.8 hours. In total 28.5% participants were classified as poor sleepers. A significant interaction was identified between depressive symptoms and sleep duration (P-value 0.03) and sleep quality (P=0.10). Participants defined as poor sleepers without depression symptoms had lower TBS compared to good sleepers (beta=-0.03, P-value=0.05) but not observed in those with depressive symptoms (beta=0.02, P-value=0.6). Longer duration of sleeping was associated with higher TBS (beta=.042, Pvalue=0.001) but not among individuals with depressive symptoms (beta=-0.03, Pvalue=0.40.

Conclusion(s): Poor sleep quality and duration are associated with low TBS only in individuals without depression symptoms.

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P151

The relationship between bone turnover and flu-like symptoms after zoledronate following denosumab discontinuation, the ZOLARMAB study

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Background/Introduction: In ZOLARMAB, we investigated if treatment with zoledronate (ZOL) prevents BMD loss after denosumab (DMAB) discontinuation. 61% of our participants experienced flu-like symptoms after the first ZOL infusion.

Purpose: To investigate the relationship between bone turnover and other variables and the acute phase reactions (APR).

Methods: In ZOLARMAB, a randomized, open label, interventional study with 61 patients discontinuing DMAB after 4.6±1.6 years, we administrated ZOL 6 months (6M group) or 9 months (9M group) after the last DMAB or when bone turnover had increased (OBS group). We re-administrated ZOL if BMD decreased ≥5% or p-CTX increased ≥1.26 µg/L. Clinicaltrials NCT03087851.

Results: The majority of the patients from the 6M group experienced APR after ZOL, whereas it was well-balanced in the 9M and OBS groups (chi-sq, p=0.07) (table). All patients treated with ZOL based on the p-CTX criteria experienced APR. P-CTX, p-PINP, and p-BSAP at the time of ZOL treatment were similar between patients experiencing APR and those that did not, however, in the OBS group p-CTX was significantly higher among the patients experiencing APR (p<0.01). Only 14% of men, but 67% women experienced APR (p<0.01). Age, vitamin D status, duration of DMAB treatment, time since last DMAB, or previous bisphosphonate treatment were not associated with APR. Only 7% experienced APR after the second infusion.

	6-month group (n=20)		9-month group (n=20)		Observation group (n=21)		Total (n=61)	
Acute phase reaction	Yes	No	Yes	No	Yes	No	Yes	No
Number (%)	16 (80)	4 (20)	9 (45)	11 (55)	12 (57)	9 (43)	37 (61)	24 (39)
Mean p-CTX (µg)	0.20 ± 0.22	0.21 ± 0.13	0.90 ± 0.33	0.81 ± 0.30	1.2 ± 0.48	0.65 ± 0.20	0.67 ± 0.55	0.65 ± 0.32
Gender (female / male)	16 / 0	2 / 2	8 / 1	9 / 2	12 / 0	7 / 2	36 / 1	18 / 6
Months since last DMAB	6.0 ± 0	6.0 ± 0	8.8 ± 0.4	9.0 ± 0	9.6 ± 1.6	11.3 ± 1.3	7.8 ± 1.9	9.4 ± 2.0

Conclusion(s): High p-CTX levels and female gender might be associated with a high incidence of acute phase reaction after ZOL treatment following long-term DMAB.

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