



Correlation Between Localized Femoral BMD T-scores and Sites of Hip Fractures, and Evaluation of the Sensitivity of FRAX[®] Probability in Hip Fracture Patients



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Introduction

Hip fracture patients, defined as femoral neck and intertrochanteric fracture, have low T-scores in BMD. In these days, FRAX[®] tool is used for measuring probability of major osteoporotic fracture and hip fracture in 10-years. We compared T-scores of each femoral neck and trochanteric area in the neck fracture patients (NFP) and intertrochanteric fracture patients (IFP). Our hypothesis is that T-score of neck portion in NFP is lower than T-score of neck portion in IFP, and vice versa. We also evaluate how FRAX[®] probability is meaningful and sensitive in hip fracture patients.

Materials & Methods

◆ Localized femoral BMD T-scores and sites of hip fractures

- ✓ 180 hip fracture patients with BMD measured by DXA
 - : 98 for femoral neck fracture patients
 - 82 for intertrochanteric fracture patients
- ✓ T-score of localized femoral BMD
 - : femoral neck, trochanter, and total femur
- ✓ Correlation between localized femoral BMD T-scores and fracture sites of hip was done.

◆ FRAX probability with individual patients

- ✓ FRAX[®] probability
 - : Computer-based algorithm from WHO.
- ✓ Comparison between femoral neck fracture group and intertrochanteric fracture group by FRAX[®] probabilities.
- ✓ High risk group by FRAX[®]
 - : Defined as 10-years major osteoporotic fracture probability ($\geq 20\%$) or hip fracture probability ($\geq 3\%$).
- ✓ We also checked how many patients were included in high risk group

Table 1. Localized BMD T-score in femoral neck fracture patients and intertrochanteric fracture patients

Localization of BMD T-scores	Neck Fracture group	Intertrochanteric Fracture Group	P-value
Neck portion	-3.23	-2.93	P=0.029
Trochanteric portion	-2.54	-2.56	P=0.95
Total	-2.92	-2.75	P=0.28

Table 2. Fracture probability calculated by FRAX[®] tool in femoral neck fracture patients and intertrochanteric fracture patients

FRAX [®] fracture probability (10 yrs fracture probability)	Neck Fracture group	Intertrochanteric Fracture Group	P-value
Probability of major osteoporotic fracture	14.4 %	11.1 %	p=0.009
Probability of hip fracture	8.6 %	5.9 %	p=0.008

Table 3. Percentage of high risk group for osteoporotic fractures designated by FRAX[®] tool in femoral neck fracture patients and intertrochanteric fracture patients

High risk group for osteoporotic fractures by FRAX [®] designation	Neck fracture patients	Intertrochanteric fracture patients
Major osteoporotic fractures (FRAX [®] probability > 20%)	19/97 (19.50%)	8/79 (10.1%)
Hip osteoporotic fracture (FRAX [®] probability of hip >3%)	75/97 (77.3%)	64/79 (80.8%)

Result

◆ Localized femoral BMD T-scores and sites of hip fractures

- ✓ Average of T-scores in neck portion
 - : NFP (-3.23) < IFP (-2.93), p = 0.029
- ✓ Average of T-scores in trochanteric portion.
 - : NFP (-2.54) > IFP (-2.56), p = 0.95
- ✓ Average of T-scores in total femur
 - : NFP (-2.92) < IFP (-2.75), p = 0.28

◆ FRAX probability with individual patients

- ✓ FRAX probability of Major osteoporotic fractures I
 - : NFP (14.4%) > IFP (11.1%), p=0.009
- ✓ FRAX[®] probability of hip fracture in
 - : NFP (8.6%) > IFP (5.9%), p=0.008
- ✓ High risk group for major osteoporotic fracture
 - : 19.5% of NFP and 10.1% of IFP
- ✓ High risk group for hip fracture
 - : 77.3% of NFP and 80.8% of IFP

Conclusion

Localized femoral T-scores can be valuable predictive factor for hip fracture in osteoporotic patients. High risk group designated by FRAX[®] probability is meaningful and sensitive tool to evaluate the hip fractures in osteoporotic patients.

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