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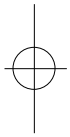44   50   171
                                    0.725 g/cm²

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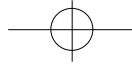   134,
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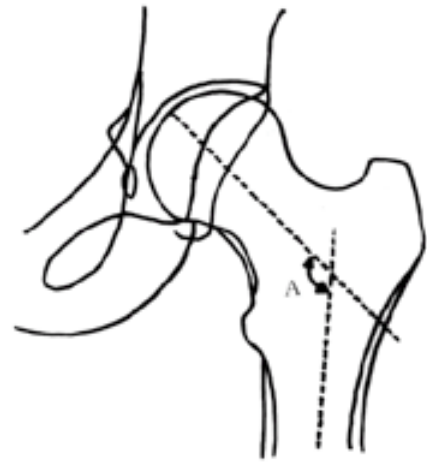,   200

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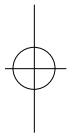1,3,5,8,12).   135   ,

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Fig 1. Diagram of Proximal Femur showing the Definition of the Femoral neck shaft angle. Angle A, Femoral neck shaft angle, is defined as the Angle formed between the Line from the Caput femoris through the center of the Femoral neck to the below the lateral aspect of the Greater trochanter and the Mid-diaphyseal line of Femoral shaft.

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171   .   ,

0.725 g/cm²   15

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30   50   71   (DEXA, Lunar Expert, Madison, WI, USA)

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Coefficient of Variation   3-4%   .

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(110cm)   ,

(Fig. 1).   ,

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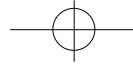
Table 1A-B.
(A) Variation of Femoral neck shaft angle according to Age in Non-osteoporosis group.

Age	Neck shaft angle
31 - 40	130.4
41 - 50	129.5
51 - 60	129.5
61 - 70	128.6
71 - 80	126.0
81 - 90	126.0

Significant correlation between age and femoral neck shaft angle ($p<0.05$)

(B) Variation of Femoral neck shaft angle according to Age in Osteoporosis group.

Age	Neck shaft angle
51 - 60	129.3
61 - 70	128.6
71 - 80	128.8
81 - 90	128.7

No significant correlation between age and neck shaft angle ($p>0.05$)

**Table 2.** Comparison of Femoral neck shaft angle between Osteoporosis group and Non-osteoporosis group.

Osteoporosis	Non-osteoporosis
128.8	128.7

No significant difference between osteoporosis group and Non-osteoporosis group ($p>0.05$)

Table 3. Comparison of Femoral neck shaft angle between Fracture group and No fracture group.

	Osteoporosis	Non-osteoporosis
Fracture	129.0	129.0
No fracture	128.5	128.7

No significant difference between fracture group and no fracture group ($p>0.05$)

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30-40

($p<0.05$)
                                (Table 1).

                                (Table 2.),

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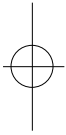
                                (Table 3).
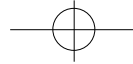   ,
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0.001, 1.106

                                (Table 4).

Table 4. Odds ratios of Variables on Multiple Logistic Regression Models of Hip fracture.

	Odds Ratios (95% Cl)	p
Femoral neck BMD	0.001 (0.0, 0.5)	0.03
Neck shaft Angle	1.014 (0.9, 1.1)	0.82
Age	1.009 (1.0, 1.1)	0.73
Sex	0.583 (0.2, 1.9)	0.36
Height	1.106 (1.0, 1.2)	0.01
Weight	0.984 (0.9, 1.0)	0.55

The odds ratio is calculated for a 1SD increase from matched control subject

3,5,8,12).

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Karlsson   8)   Singh index, femoral neck index,

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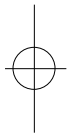
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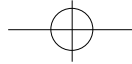10).   . Faulkner   3)

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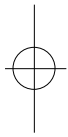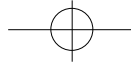
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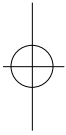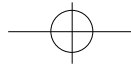
| Abstract |

The Relationship between the Variation of the femoral neck-shaft angle according to Age and the Fracture of the Hip

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Department of Orthopedic Surgery, Yonsei University College of Medicine, Seoul, Korea

Purpose : Femur neck-shaft angles were obtained from plain radiographs of the pelvis and their changes according to age were assessed along with their correlations to hip fracture incidence.

Materials and Methods : Forty-four patients who have received surgical treatments for femur neck or intertrochanteric fractures and 171 patients who performed bone densitometry at out patient clinic without any history of hip fractures were included in the study. All patients were older than 50 years. Standard value of 0.725 g/cm^2 was used to separate the osteoporosis and non-osteoporosis groups. Femur neck-shaft angle was measured from standardized radiograph.

Results : In the non-osteoporosis group, varization of femur neck-shaft angle was observed as age increased. No significant difference of the neck-shaft angle was proven between osteoporosis and non-osteoporosis group, and no correlation existed between the femoral neck bone mineral density and neck-shaft angle. Furthermore, fracture group and no fracture group showed no significant difference in neck-shaft angle.

Conclusion : The decrease in the neck-shaft angle with age increments has no effects on incidence of hip fracuture and factor most closely associated with fractures is bone mineral density.

Key Words : Hip, Fracture, Femoral neck shaft angle

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