

# Subtrochanteric femoral fractures (atypical or not) and previous treatment with bisphosphonate.

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## Introduction

The subtrochanteric femoral fracture requires special attention in a Fracture Liaison Service (FLS) unit to screen for atypical fracture.

Objectives: To analyze the characteristics of the subtrochanteric fracture in a FLS.

## Methods

Patients >50 years were attended for fragility fracture of the proximal femur during the period 2022-2024 were included.

The type of fracture and fracture risk factors as well as previous treatment for osteoporosis were analyzed. For atypical femoral fracture we applied  $\geq 4$  of the following major criteria (Shane et al. J Bone Miner Res. 2014): 1) No or minimal trauma; 2) line begins laterally and is basically transverse; 3) may progress to complete with medial spicule; 4) not comminuted or minimally comminuted; and 5) periosteal thickening in external cortex.

## Results

A total of 390 patients were included, 82.8% women, mean age 79 years. 192 (49%) fractures were of the femoral neck, 142 were pertrochanteric (43%) and 30 (7%) were subtrochanteric. The table shows the characteristics of the patients.

The subtrochanteric fracture was associated with a higher body mass index and previous treatment with bisphosphonate. Multivariate analysis resulted in OR 1.124 (95% CI 1.045-1.209;  $p=0.002$ ) for BMI and OR 2.811 (95% CI 1.146-6.895;  $p=0.02$ ) for previous bisphosphonate. In patients with subtrochanteric fracture, 6 had received alendronate, 1 risedronate and 1 denosumab.

One patient (previous alendronate) met criteria for atypical femoral fracture (0.25% of the whole sample, 3.3% of subtrochanteric type and 2.1% of patients with previous treatment with bisphosphonate or denosumab).

None of the patients had a contralateral femoral fracture during the average follow-up of 24 months.

	All patients (n=390)	Subcapital or pertrochanteric hip fracture (n=360)	Subtrochanteric hip fracture (n=30)	p
Female, N (%)	323 (82.8)	297 (82.5)	26 (86.6)	0.56
Age, mean (SD)	79.0 (9.3)	78.9 (9.4)	80.0 (7.4)	0.50
Assessment during admission, N (%)	248 (63.6)	240 (66.6)	22 (73.3)	0.45
Years of education <8, N (%)	311 (79.7)	284 (78.8)	27 (90)	0.14
<b>Risk factors, N (%)</b>				
Body mass index, mean (SD)	25.9 (5.0)	25.8 (4.7)	28.7 (5.3)	<0.001
Previous fragility fracture	99 (25.3)	86 (23.9)	11 (36.6)	0.12
Parent hip fracture	69 (17.7)	63 (17.5)	6 (20)	0.73
Current smoker	45 (11.5)	42 (11.6)	3 (10)	0.78
Glucocorticoids	30 (7.7)	26 (7.2)	4 (13.3)	0.22
Rheumatoid arthritis	13 (3.3)	12 (3.3)	1 (3.3)	0.99
Secondary osteoporosis	76 (19.5)	68 (18.8)	8 (26.6)	0.30
Alcohol	15 (3.8)	14 (3.8)	1 (3.3)	0.63
Previous densitometry, N (%)	100 (25.6)	89 (24.7)	11 (36.6)	0.15
Femoral neck T score, mean (SD)	-2.1 (1.0)	-2.2 (1.0)	-2.0 (1.1)	0.36
Previous bisphosphonate or denosumab, N (%)	47 (12.0)	39 (10.8)	8 (26.6)	0.01

## Conclusion

Subtrochanteric femoral fractures are associated with higher BMI and the use of bisphosphonate or denosumab.

Atypical fracture is rare, accounting only 3% of subtrochanteric type.

