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(55~73)

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Insufficiency Fractures of the Femoral Shaft Associated with Osteoporosis

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Purpose: To present a clinical experience of the insufficiency fractures of the femoral shaft associated with osteoporosis.

Materials and Methods: From January 1995 to December 2002, four patients (8 cases, four females) more than 1-year follow up were reviewed retrospectively. The mean age was 61 years (range, 55 to 73). Medical records and roentgenograms were reviewed.

Results: The fractures were bilateral. Plain film revealed fracture line in six among seven cases excluding 1 displaced fracture at initial presentation. All cases presented osteoporosis, anterolateral bowing of the femur, and hot spot in bone scan. Five cases (four displaced, one impending displaced fracture) underwent interlocking intramedullary nailing and all five of them manifested no evidence of delayed union. The preoperative thigh and knee joint pain improved postoperatively.

Conclusion: Femoral shaft insufficiency fracture could occur rarely in patients with anterolateral bowing of the femur and postmenopausal osteoporosis. Careful history taking, radiography and bone scan are necessary, and bone scan is helpful for early diagnosis. Once diagnosed as the insufficiency fracture with fracture-related symptoms, prophylactic nailing may be necessary lest complete displaced fracture should occur.

Key Words: Femoral shaft, Insufficiency fracture, Osteoporosis

(insufficiency fracture)^{6,18)}

(fatigue fracture)

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(long bone)

(pathologic fracture)

4,11)

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Table 1. Clinical data of the patients

Patient	Case	Age	Side	Displacement	Treatment	BMD*	Symptom duration	Biopsy
1	1	60	Right	-	Conservative	-4.54	-	-
	2		Left	+(F) [†]	interlocking IM nailing		4 months	+
2	3	55	Right	+(F)	interlocking IM nailing	-3.2	3 months	+
	4		Left	-	Conservative		-	-
3	5	73	Righ	+(F)	interlocking IM nailing	-3.96	7 months	-
	6		Left	-	interlocking IM nailing (P) [‡]		12 months	-
4	7	56	Right	+(I) [§]	interlocking IM nailing	-4.5	-	-
	8		Left	-	Conservative		-	-

[‡]P, prophylactic, ^{\$}I, displaced fracture at initial presentation

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 (Fig. 3). 3 (1, 2
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 (Fig. 가
 4). 2 (Case 2, 3) 가
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 .
 가 (vague pain)
 Hanging leg sign¹⁶⁾ 가
 Pentecost , , 가 가 가
 Fulcrum test⁹⁾가
 18).
 Daffner Pavlov (stress fracture) .
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Table 2. Proposed stage and treatment of the insufficiency fracture of the femoral shaft

Classification	Radiologic and clinical findings	Treatment recommendation
Stage I	No fracture line	Conservative
	Diffuse linear hot uptake at bone scan	
	No thigh and knee pain	
Stage II	Unicortical stress fracture line(s)	Conservative and Activity limitation
	Relatively localized hot uptake	
	No thigh and knee pain	
Stage III	Unicortical or bicortical stress fracture line(s)	Conservative or prophylactic intramedullary nailing
	Localized fusiform hot uptake at bone scan	
	Thigh and/or knee pain	
Stage IV	Displaced fracture	Intramedullary nailing

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