Osteoporosis in 5 elderly women with pubic osteolysis

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ABSTRACT – 5 elderly women developed pubic osteolysis after spontaneous fracture of the pubic bone. Radiographs showed gradual progression of the osteolysis, followed by callus formation, and bone union after 4–5 months. Bone mineral density was low in all patients. White blood cell count, erythrocyte sedimentation rate, and C-reactive protein were normal. Urine deoxypyridinoline was high, but serum osteocalcin normal. Elderly women with spontaneous fractures and osteolysis of the pubic bone should be considered for evaluation of osteoporosis and treatment.

Pubic osteolysis is rare and occurs after an insufficiency fracture of the pubic bone (Goergen et al. 1978). Progressive osteolysis is also seen on radiographs of patients with osteomyelitis or malignancy. High age and osteoporosis are common in patients with pubic osteolysis (Hall et al. 1984). We studied bone mineral density (BMD) and bone metabolic markers in 5 patients with pubic osteolysis.

Patients and findings

We followed 5 women (mean age 80 (70–88) years) who had had spontaneous groin and/or gluteal pain for 1–2 years. The first radiographs taken 1–3 months after its onset, showed a fracture of the pubic bone and mild osteolysis around it in all patients. No signs of neoplasm were seen on the MRI. None of the patients had a history of previous pelvic surgery or urinary tract infection, and white blood cell count, erythrocyte sedimentation rate, and C-reactive protein were normal. The diagnosis of pubic osteolysis was made in all patients.

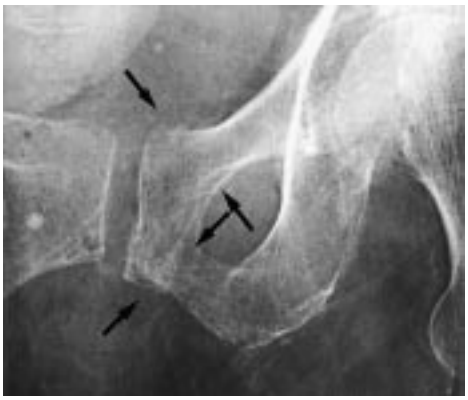
Radiographs taken every other week to evaluate the healing of the fracture showed gradual progression of osteolysis for 4–6 weeks, but this was followed first by callus formation, and then bone union after 4–5 months. We also determined the concentration of urine deoxypyridinoline divided by creatinine (DPD) as a bone resorption marker, and the concentration of serum osteocalcin, as a bone formation marker, in 4 patients (Table 1). The concentrations of DPD were very high on the first examination, but those of osteocalcin were normal (Table 1). 6 months later, the concentrations of DPD were normal, but those of osteocalcin showed no change. BMD was determined at two sites in each patient: in the calcaneus by single-energy X-ray absorptiometry (SXA) (Osteo Analyzer, Norland Medical System, U.S.A.) and in the lumbar spine by dual-energy X-ray absorptiometry (DXA) (Hologic QDR-1000, Waltham, U.S.A.). BMD was evaluated with the T-score (SD, standard deviation)—i.e., values relative to the mean value for young adults. BMD was extremely low in all patients: –2.9 to –4.7 SD in the calcaneus and –2.7 to –3.2 SD in the lumbar spine (Table 1). The patients were treated for osteoporosis with calcitonin (20 IU/week) and vitamin D3 (0.5–1.0 μg/day). Their pain subsided with rest and later disappeared.

A typical patient was an 88-year-old woman who complained of pain in her groin after shoveling

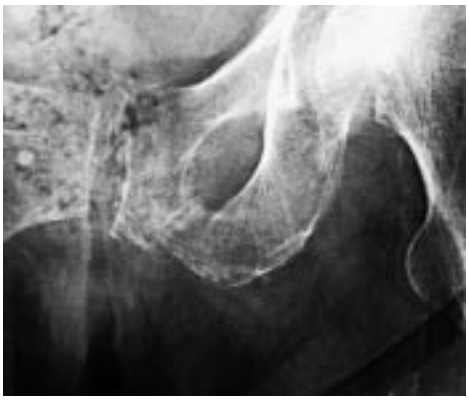
Table 1. Patient data

A	B	C	D	E	F	G	H	I	J	K	L
1	88	0	4	48	20	–4.51	–3.20	22.0	4.6	5.9	6.2
2	72	0	3	48	14	–2.92	–2.71	7.9	4.1	7.2	8.0
3	70	1	10	72	16	–3.24	–3.13	11.4	6.2	8.7	7.4
4	87	2	UN	48	20	–4.52	ND	11.7	6.1	5.5	6.0
5	81	1	8	96	18	–4.67	–3.05	ND	ND	ND	ND

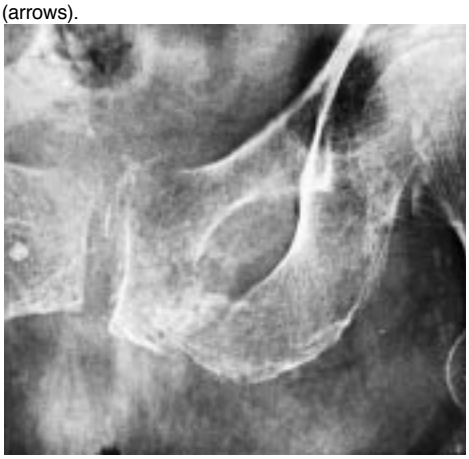
A Patient number
B Age (years)
C History of pain
  0 Shoveling snow
  1 Long walk
  2 Nothing in particular
D Duration from onset to the first medical examination (weeks)
E Follow-up (weeks)
F Duration of bone union (weeks)
G BMD Calcaneus (standard deviation)
H BMD Lumbar spine (standard deviation)
DPD (normal range 2.8–7.6 nM/mM • Cr)
I Initial
J 6 months
Osteocalcin (normal range 3.1–12.7 ng/mL)
K Initial
L 6 months
ND Not done
UN Unknown



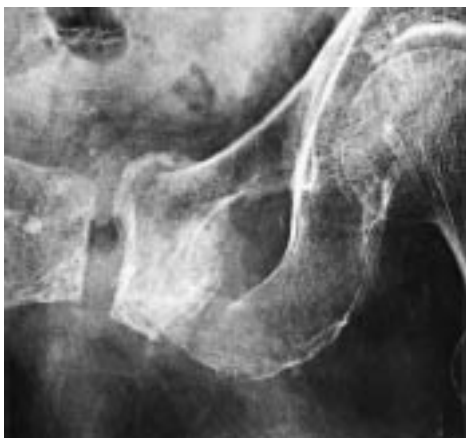
Case 1. Undisplaced fracture of the pubic bone (arrows).



2 weeks later, central osteolytic defect.



4 weeks later, osteolytic defect with callus.



5 months later, complete bony union.

snow. The initial radiograph showed undisplaced fractures. 2 weeks later, osteolysis appeared, and 4 weeks later, callus was seen. 5 months later, the fractures had healed (Figure).

Table 2. Previous publications on pubic osteolysis, all women

Case	A	B	C	Reference
1	62	0	4	Albertsen et al. 1994
2	50	0	5	– " –
3	79	3	0	– " –
4	79	3	0	– " –
5	62	0	1	– " –
6	84	0	0	– " –
7	88	3	0	– " –
8	76	0	3	– " –
9	78	0	3	– " –
10	72	3	0	– " –
11	73	3	0	– " –
12	76	3	0	– " –
13	72	3	0	– " –
14	69	0	3	– " –
15	78	0	0	An et al. 1988
16	54	0	1	Goergen et al. 1978
17	68	2	0	– " –
18	44	1	0	– " –
19	63	0	0	Ghezail et al. 1991
20	65	1	0	Hall et al. 1984
21	72	0	0	– " –
22	72	1	0	– " –
23	84	1	0	– " –
24	67	0	6	Matsumoto et al. 1997
25	81	1	0	McCarthy & Dorfman 1990
26	60	0	0	– " –
27	78	1	0	– " –
28	66	0	0	– " –
29	67	0	0	– " –
30	80	1	0	– " –
31	76	0	2	McGuigan et al. 1984
32	55	0	3	Ramon et al. 1994
Average	70.3			
SD	10.35			

A Age (years)
B Trauma
- 0 None
- 1 Fall
- 2 Automobile accident
- 3 Trauma, but no details are given in the literature

C Complication
- 0 None
- 1 Alcoholism
- 2 Rheumatoid arthritis
- 3 Radiotherapy
- 4 Secondary hyperparathyroidism
- 5 Emaciated
- 6 Parkinson's disease

Discussion

MRI and examination of serum (white blood cell count, erythrocyte sedimentation rate, C-reactive protein) are necessary in patients with pubic osteolysis to rule out osteomyelitis or malignant neoplasms (Rosenthal et al. 1982). The pathogenesis of pubic osteolysis is not clear, but most patients are elderly women with reduced bone mass (Hall et al. 1984). All of our patients and 32 others (mean age 70 years) reported elsewhere (retrieved by MedLine) were elderly women (Tables 1 and 2). In previous reports, the fractures were related to trauma in 15 patients, unrelated to trauma in 17 patients, and 10 of them seemed to have secondary osteopenia (alcoholism, rheumatoid arthritis, radiotherapy, secondary hyperthyroidism, emaciation, Parkinson's disease). BMD measurements in our patients showed osteoporosis. The bone resorption marker showed very high values on the first examination, and normal range 6 months later. This finding seems to occur during normal healing of a fracture. However, treatment of our patients with calcitonin does not permit evaluation of the natural course of pubic osteolysis. Elderly women with spontaneously sustained fractures and osteolysis of the pubic bone should be considered for evaluation of osteoporosis and treatment.

Albertsen A M, Egund N, Jurik A G, Jacobsen E. Posttraumatic osteolysis of the pubic bone simulating malignancy. Acta Radiol 1994; 35: 40-4.

An H S, Jackson T, Hawthorne K B. Osteolysis of the pubic bone simulating malignancy. A case report and review of literature. Orthopedics 1988; 11: 951-4.

Ghezail M, Leroux J L, Chertok P, Blotman F. Pubic postfracture osteolysis simulating a malignancy. Clin Exp Rheumatol 1991; 9: 635-7.

Goergen T G, Resnick D, Riley R R. Posttraumatic abnormalities of the pubic bone simulating malignancy. Radiology 1978; 126: 85-7.

Hall F M, Goldberg R P, Kasdon E J, Glick H. Posttraumatic osteolysis of the pubic bone simulating a malignant lesion. J Bone Joint Surg (Am) 1984; 66: 121-6.

Matsumoto K, Hukuda S, Ishizawa M, Chano T, Okabe H, Maeno M. Pubic osteolysis mimicking a malignant lesion: report of a case with a fracture dislocation of the sacroiliac joint. Skeletal Radiol 1997; 26: 438-42.

McCarthy B, Dorfman H D. Pubic osteolysis. A benign lesion of the pelvis closely mimicking a malignant neoplasm. Clin Orthop 1990; 251: 300-7.

McGuigan L E, Edmonds J P, Painter D M. Pubic osteolysis. J Bone Joint Surg (Am) 1984; 66: 127-9.

Ramon R, Garcia S, Segur J M, Combalia A, Suso S. Pubic osteolysis simulating a malignant lesion: case report. J Trauma 1994; 36: 597-8.

Rosenthal R E, Spickard W A, Markham R D, Rhamy R K. Osteomyelitis of the symphysis pubis: a separate disease from osteitis pubis. Report of three cases and review of the literature. J Bone Joint Surg (Am) 1982; 64: 123-8.