Atypical Femoral Fracture: Failure to Prevent the Forthcoming

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ABSTRACT

Although biphosphonates showed robust efficacy in fracture prevention, recent data revealed a number of adverse events. Atypical femoral fracture is one of them. Here, a 73 year old female patient who continued alendronate therapy despite unilateral atypical femoral fracture and developed the second one on the other side one year later is presented. The purposes of this manuscript are; emphasizing atypical femoral fracture as an adverse event with increasing incidence, reviewing the knowledge about duration of biphosphonate therapy and drug holiday and highlighting that biphosphonates should be stopped in the presence of an atypical femoral fracture and this should be explained to the patient in a clear way especially if he/she is elderly.

Keywords: Aged, alendronate, communication disorders, femoral fracture, osteoporosis

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INTRODUCTİON

Biphosphonates, even though the mainstay of osteoporosis treatment, have been found to be associated with an increasing number and frequency of adverse events as the exposure time increases. Atypical femoral fractures (AFF) are one of these problems (1). Here an elderly patient who continued alendronate therapy after the first fracture and developed bilateral AFF within a year is presented.

CASE REPORT

A 73 year old female patient appealed to our outpatient clinic with left thigh pain that has started one month ago. The pain was on the antero-lateral part of the thigh and exacerbated during last week. There was no history of trauma, fall or alcohol intake. The patient was on biphosphpnates for about 15 years and has been receiving alendronate 70 mg once a week continuously for the last 8 years with a diagnosis of postmenopausal osteoporosis. She also had a history of atraumatic spontaneous diaphyseal femoral fracture on the right side one year ago. The fracture was treated with intramedullary nailing and the patient was able to return to weigt-bearing activity. She continued taking alendronate therapy after the fracture. Apart from these she had diabetes mellitus and hypertension and was taking medication for them.

Clinical examination revealed an antalgic gait. Range of motion of the left hip and knee and muscle strength examinations could not be performed properly due to increased pain. Left femoral shaft was painful on palpation. A prompt plain radiography disclosed beaking and cortical thickening of the lateral femoral diaphysis. (Figure 1, 2) The patient was diagnosed as AFF of the left femur. Alendronate therapy was discontinued and patient was consulted with the orthopedy department immediately.

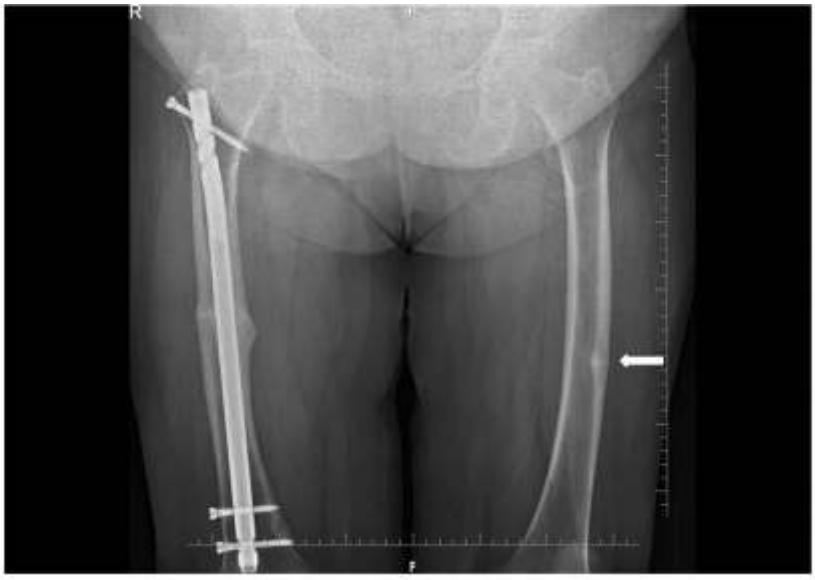

Fig. 1: Antero-posterior X-ray showing fractures on both sides and intramedullary nailing of the right femur

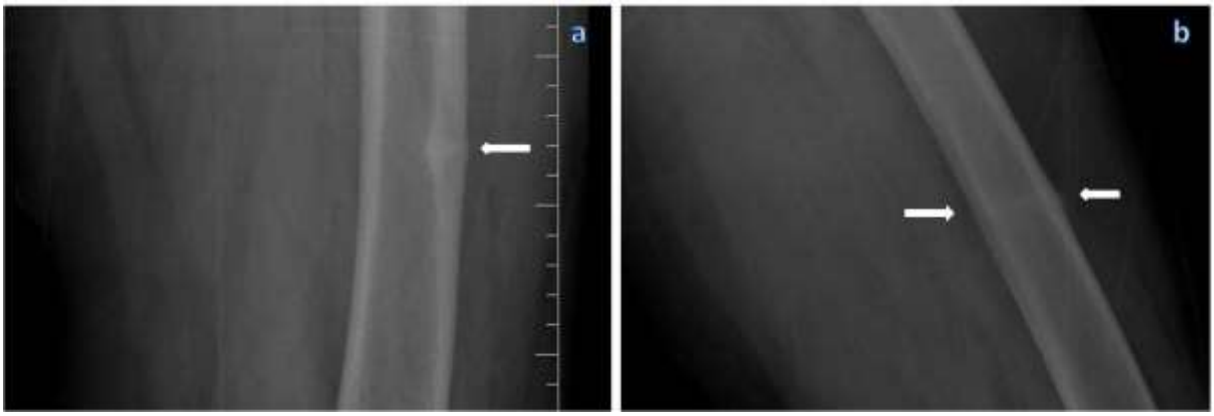

Fig 2: (a) Antero-posterior X-ray of the left femur, showing lateral cortical thickening and beaking (b) Lateral X-ray of left femur showing fracture line.

DİSCUSSİON

Biphosphonates supress normal bone turnover by delaying remodelling. As a result reduced fracture healing and accumulation of microfractures occur. Small decrease in turnover may induce significant accumulation of microdamage. This process results in reduction of energy

absorption capacity and toughness (2,3). AFFs are defined as atraumatic or low-trauma fractures located in the subtrochanteric femoral region. They originate at the lateral cortical margin and have a transverse or oblique orientation. There is localized periosteal or endosteal thickening of the lateral cortex at the fracture site which is denominated as beaking or flaring. While incomplete ones involve only the lateral cortex, complete fractures extend through both cortices. AFFs are non-comminuted or minimally comminuted. A dull or aching pain in the groin or thigh may accompany the above mentioned features. The fracture must be located just distal to the lesser trochanter and proximal to the supracondyler flare. Fractures of the femoral neck, intertrochanteric fractures with spiral subtrochanteric extension, periprosthetic fractures, pathological fractures of primary or metastatic bone tumors and miscellaneous bone diseases are not AFFs (4).

Biphosphonate associated AFFs have an incidence of 1/1000 patients per year. The age adjusted relative risk (RR) of AFFs is 55 for women and women has a 3-fold greater risk compared to men. Alendronate users have a 2-fold higher age-adjusted risk than risedronate users. The higher risk of developing AFFs is evident only after 1 year of biphosphonate use and increases thereafter. Despite these dramatic numbers, the risk decreases as 70% per year since last use, rapidly after cessation (5,6,7). Although the risk-benefit ratio is quite favorable at the begining of biphosphonate treatment in patients with good indication, it seems like prolongation of treatment beyond 5 years doesn't further reduce the risk and the risk-benefit ratio is inverted. To date an optimal duration for biphosphonate treatment hasn't been determined and decisions to continue or stop treatment should be made on individual basis (1,6).

Sixty-four % of cases with AFFs demonstrate involvement of the contralateral femur so clinicians have the chance to preclude the contralateral femur when first AFF occurs. In this situation; plain radiographies, computed tomography or magnetic resonance imaging of

the other side should be performed. On clinical follow-up biphosphonates should be stopped and might better be replaced by a parathormone analogue. In addition patients should be clearly informed about their clinical condition, the increased risk of contralateral femur fracture so that they will pay close attention to minor abnormalities (2,3). The cessation of alendronate therapy should also be explained in an explicit way because patients may have difficulty understanding why they stop receiving an antiosteoporotic drug in the case of a fracture.

In our case, even though we do not have any information whether alendronate therapy had been advised to be stopped or not after the first fracture one year ago, it is precluded that she misunderstood and continued taking alendronate. At this point communication problems in the elderly group come into prominence. For elderly patients and their health care providers, communication is the most vital topic. Hearing loss, visual disturbances, memory problems, depression, cognitive impairment, dementia, decrease in speaking volume and fluency, dysarthria affect the communication of elderly. Also elderly people may have a lack of insight into their illness and difficulties with treatment compliance and following their treatment programme. As a result clinicians should make extra effort to make the conversations more understandable. To improve communication; a quiet room, eye contact, simple grammer with pauses underlining the phrases, a clear language, repetitions of important points are important. Written information or pictured documents of what you are telling orally may also help. Baby talk, addressing the patient with endearing or cute names such as ‘honey’, ‘sweetie’, ‘dear’, speaking too loud and speaking very slowly or quickly should be avoided (8).

In conclusion, presenting this case the authors wanted to emphasize three points. Firstly, patients underwent biphosphonate treatment should be under close monitoring. Secondly, drug holiday should be in mind after some period of regular biphosphonate use.

And last but foremost, biphosphonates should be stopped in the presence of an AFF and this should be explained to the patient in a clear way especially if he/she is elderly.

REFERENCES

1. Whitaker M, Guo JG, Kehoe T, Benson G. Biphosphonates for osteoporosis-where do we go from here? New Engl J Med 2012; **366:** 2048–51. (PMID:22571168).
2. Edwards MH, McCrae FC, Young-Min SA. Alendronate-related femoral diaphysis fracture-what should be done to predict and prevent subsequent fracture of the contralateral side? Osteoporos Int 2010; **21:**701–3. (PMID:19562241).
3. Im GI, Jeong SH. Pathogenesis, management and prevention of atypical femoral fractures. J Bone Metab 2015; **22:** 1–8. (PMID:25774358).
4. Shane E, Burr D, Abrahamsen B et al. Atypical subtrochanteric and diaphyseal femoral fractures: second report of a task force of the American Society for Bone and Mineral Research. J Bone Miner Res 2014; **29:** 1–23. (PMID:23712442).
5. Schilcher J, Aspenberg P. Incidence of stress fractures of the femoral shaft in women treated with bisphosphonate. Acta Orthop 2009; **80:** 413–5. (PMID:19568963).
6. Schilcher J, Koeppen V, Aspenberg P, Michaelson K. Risk of atypical femoral fracture during and after biphosphonate use. Acta Orthop 2015; **86:** 100–7. (PMID:25582459).
7. Schilcher J, Michaelsson K, Aspenberg P. Bisphosphonate use and atypical fractures of the femoral shaft. N Engl J Med 2011; **364:** 1728–37. (PMID:21542743).
8. Cingi CC, Muluk NB, Yılmaz O. Communication disorders in elderly people. Turkish J Geriatr 2015; B 162–6.