



Pathologic Femur Fracture: An Unusual First Clinical Manifestation of Prostate Carcinoma

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Abstract:

Prostate cancer is one of the most common and slow growing malignancy among older males. Because of its origin in the peripheral zone, the majority of the patients present later in the course. Common symptoms associated with prostate carcinoma include lower urinary tract symptoms (LUTS), back pain and anaemia. The pathologic fracture secondary to prostate carcinoma is relatively rare because of its blastic nature of metastatic deposit. We have presented such case for its atypical presentation and for the requirement of a multidisciplinary approach. A 80 year old male with fracture right femur referred to urology OPD for LUTS. He was found to have prostate cancer with MRI showing heterogenous signal intensity area suggestive of metastatic bony deposit in the proximal aspect of right femur with surrounding soft tissue involvement and subtrochanteric fracture. MRI guided biopsy showed osteoblastic metastasis. The patient was treated in a team approach involving orthopaedic surgeon, urologist and medical oncologist.

Key words: Back Pain, Femoral Fractures, Prostatic Neoplasms, Fractures, Orthopedics.

Introduction

The proportion of prostate cancer (CaP) diagnosed at a loco-regional stage is much higher than the distant stage, and it is 91-93% and 4-6% respectively [1]. Therefore, the majority of cases produce few symptoms in the early course, often similar to those of benign prostatic hyperplasia, and may go unnoticed. Nevertheless, prostate cancers do metastasize and bone is the most common site of distant metastasis. The exact incidence of bone metastasis at diagnosis is not known. Norgaard *et al*, have reported an incidence of almost 3% [2]. In most cases, a difficulty in micturition is the first and only symptom. Back pain, anaemia and

disability may also result from metastatic bone disease (MBD). Pathological femur fracture as the first clinical manifestation is very rare, because of the characteristic osteoblastic metastatic deposit. Herein, we report and briefly elaborate on the management of such uncommon presentation.

Case Report

An 80 year old male with a fracture proximal aspect of right femur was admitted in the orthopaedic ward following a minor fall event at home [Fig.1]. He was referred to urology OPD for

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persistent lower urinary tract symptoms (LUTS). Laboratory investigations showed 8-10 pus cells on urine examination and haemoglobin of 9 gm/dL. Digital rectal examination (DRE) revealed hard nodular prostate with grade III enlargement. On Trans rectal ultrasound (TRUS) prostate volume was 64 ml and heterogeneous echogenicity noticed throughout the prostate [Fig.2a]. The patient was investigated for serum total prostate specific antigen (PSA) and percentage of free PSA, which was 200 ng/ml and 13% respectively. TRUS guided biopsy revealed prostatic adenocarcinoma, Gleason grade 4+3 [Fig.2b]. The patient was staged with whole body MRI, which shows multiple lower signal intensity lesions in the prostate with involvement of bladder base and bilateral seminal vesicle [Fig.3a]. There was also evidence of heterogeneous signal intensity lesion in the proximal aspect of right femur with subtrochanteric femoral fracture and soft tissue involvement [Fig. 3a,3b]. The patient was subjected to MRI guided biopsy of the femoral lesion that showed an osteoblastic metastatic deposit. He required a team approach including orthopaedic surgeons, urologist and medical oncologist. Subtrochanteric fracture was treated with internal fixation by Jewett nail-plate followed by immobilization. As a first line treatment for metastatic prostate cancer, we have started androgen deprivation therapy (ADT). In our case, androgen ablation was achieved in combination with GnRH analogue (Inj. leuprolide, 7.5 mg subcutaneous monthly) and antiandrogen (Tab. Bicalutamide, 50 mg once a day). External beam radiotherapy (single fraction of 8 Gy) was considered for bone pain and for prevention of fixation loss. During the one month follow-up period, a drop in serum total PSA value (200 to 167 ng/ml) and satisfactory improvement in general condition was noticed. The patient was planned to follow-up every 3 months for the first year and every 6 months thereafter.



Fig.1: X ray pelvis showing subtrochanteric right femur fracture.



Fig.2a: Heterogenous echogenicity on TRUS.

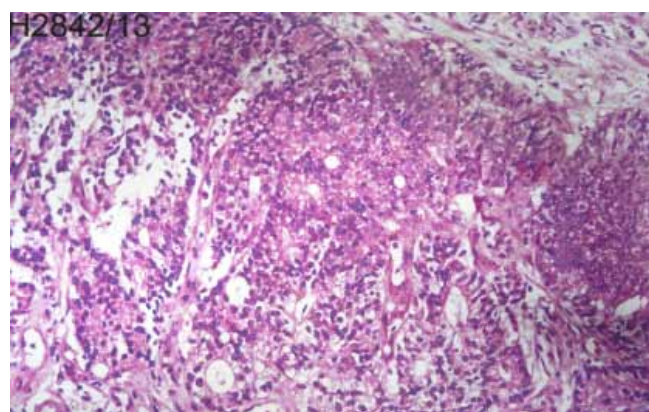


Fig.2b: Prostatic adenocarcinoma on TRUS guided biopsy.

Discussion

Metastatic bone disease (MPD) is associated with poor survival and has a detrimental effect on the quality of life. Even though prostate cancer (CaP) is considered localized; there is a high proclivity for skeletal metastasis, approximately 90% [3]. The bone involved most frequently are lower lumbar vertebrae and pelvis with a relatively lower incidence of femur head, rib case and skull involvement [4]. Metastatic disease secondary to CaP are characterized by both osteoblastic and osteoclastic, but the relative amount of blastic activity exceeds that of the clastic and dense bone formation is the net result. Again, pure lytic lesions are prone to pathologic fracture in comparing to pure blastic and mixed lytic or blastic lesions. Therefore, bone pain rather than pathologic fracture is the expected presentation of advanced CaP. In our case, patient had minimal symptoms with respect to bone pain and LUTS, but he did not seek medical attention until he manifested with subtrochanteric femur fracture. Traditionally, the ^{99m}Tc bone scintigraphy is considered the standard method for detection of skeletal metastases. Isotope scanning is more sensitive than radiography for detection of most metastases, but suffers from a lack of specificity. Thus a positive bone scan may confirm a finding, but a negative scan does not exclude a metastasis [5].

MRI is generally considered to be the most accurate imaging method for the local staging of prostate cancer [6]. It is also highly sensitive for detecting bone metastasis (BM) in cancer patients. The superiority of MRI lies in its ability to identify BM at an early stage, before host reaction of the osteoblasts becomes visible [7,8]. A meta-analysis of published studies showed that whole-body MRI had a sensitivity and specificity $\geq 90\%$ for detection of bone metastases [9]. We have used a whole body MRI to stage the disease. Although cost may be a limiting factor in staging the disease with whole body MRI. Treatment of pathologic



Fig.3a: Conventional MRI (T2 weighted image) showing multiple low signal intensity lesion in the prostate with involvement of bladder base, bilateral seminal vesicle and proximal aspect of right femur.



Fig.3b: T2 weighted image showing heterogeneous signal intensity lesion with pathologic fracture.

fracture may greatly differ from normal fracture and depends on the general condition of the patient and pattern of fracture. Internal fixation with an implant is generally preferred, because the underlying lesion may continue to erode the bone without promoting healing. Postoperative external beam radiotherapy (EBRT) can significantly reduce disease progression and subsequent loss of fixation [10]. In our case, subtrochanteric fracture was treated with internal fixation by Jewett nail-plate followed by complete immobilization and EBRT. Currently, no treatments can cure advanced CaP. In clinical practice, ADT is recommended as the initial treatment for metastatic disease. However, almost all patients eventually develop castration-resistant prostate cancer (CRPC) and thus chemotherapy becomes the first line of therapy thereafter [11,12]. Hormonal therapy in combination of a GnRH agonist with an antiandrogen is usually preferred over monotherapy [13]. In our case androgen deprivation therapy was in accordance with standard protocol. This case, was addressed in a team approach, where orthopaedic surgeon, Urologist and medical oncologist was involved.

Conclusion

Although unusual, metastatic bone disease secondary to prostate carcinoma must be considered as an antecedent cause of femur fracture sustained following the minor fall event. Nevertheless, multidisciplinary approach is the key to success in this group of patient.

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