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Characteristics of pathologic fracture around the proximal femur in prostate cancer patients with osteoblastic bone metastasis

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Purpose: It is not easy to predict risk of pathologic fracture in prostate cancer patients with osteoblastic bone metastasis by established universal scoring systems, because of different characteristics from osteolytic or mixed lesions. This study is to evaluate distinct characteristics of pathologic fracture around the proximal femur in prostate cancer patients with osteoblastic bone metastasis and consider how to prevent established pathologic fracture.
Methods: We reviewed the medical records on 122 metastatic prostate cancer patients with C61 and C7950 International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) codes in registry of this hospital from 1998 to 2014. Among them, 9 patients underwent pathologic fracture around the proximal femur. Information on pre-fracture pain, injury mechanism, radiographic findings including cortical involvement, and other imaging modality findings was reviewed.
Results: Eight patients of 9 had not complained pain in 3 months before established fracture occurred. Eight patients reported trauma history. Basicervical femoral neck fractures without displacement or with minimal displacement occurred in 6 patients. It was difficult to assess cortical involvement because cortical density could not be distinguished from osteoblastic metastasis density.
Conclusion: Pain assessment seems to be unreliable to predict risk of pathologic fracture in prostate cancer patients with osteoblastic bone metastasis. Injury mechanism may be different from those of osteolytic or mixed bone metastasis. Because most fractures occurred at the osteoblastic region where cortical discontinuity was not identified easily, frequent radiographic follow-ups could be recommended and MRI could be helpful to identify preceding occult microfracture. We also assume that comparison in bone mineral density around metastatic region could also be of help to predict fracture risk because stress concentration caused by difference in bone mineral density can provoke fracture at osteoblastic region.