

Rare Case of the T1 Hyperintense Vertebral Malignant Melanoma Metastasis

Fatih Düzgün*, Gülgün Yılmaz Ovalı and Serdar Tarhan

Faculty of Medicine, Celal Bayar University, Manisa, Turkey

Introduction

On magnetic resonance imaging (MRI), T1 hyperintense vertebral bone lesions are almost benign. However, metastatic bone malignant melanoma can show high signal on T1 sequences due to melanin and hemorrhagic component [1]. In this present case, we report T1 hyperintense lumbar bone metastasis in a metastatic melanoma patient. T1 hyperintense metastasis is a very rare condition with a few case reports in the literature so far.

A 19-year-old male patient whom was diagnosed as melanoma with multiple metastasis 2 years ago was admitted to emergency room because of the general condition abnormality with back pain. Computed tomography revealed pleural and peritoneal fluid, spleen, liver and lung metastases. On lumbar MR imaging, lumbar 5 vertebrae showed T1 hyperintensity predominantly on the right side of the corpus and peduncle. After IV contrast material, the lesion had mild enhancement (Figure 1). Fat suppressed images showed no fat components (Figures 2A and 2B).

T1 hyperintense vertebrae lesions on MR imaging are typically mostly benign. Focal T1 hyperintense lesions are in the differential diagnosis of focal fatty focus, normal variation, lipoma, hemangioma, Paget's Disease, bone marrow bleeding, malignant melanoma metastasis and Modic type 2 degeneration [1,2].

Malignant melanoma bone metastases frequency is approximately 25-50% and seen mostly in autopsy [1]. Non-vertebral T1 hyperintense bone metastases due to malignant melanoma have been documented [3]. To our knowledge, there is a few case reports for vertebrae metastasis with hyperintense T1 signal.

Monitoring T1 hyperintensity in malignant melanoma metastasis is thought to be due to the melanin content or the products of hemorrhage. Radicals and chelated metal ions have paramagnetic effect that leads to T1 bright signal. Therefore, it can be seen hypointense on T2-weighted images but T1 shortening is more prominent than T2 shortening [1,3,4].



Figure 1: (A) Axial-T1, (B) Axial-T2, (C) Post-contrast T1 weighted images showing metastatic bone marrow infiltration in the right portion and peduncle of fifth lumbar vertebra.

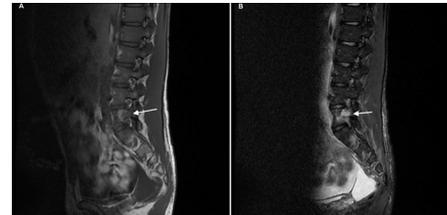


Figure 2: Sagittal T1 (A) STIR (B) images showing the bone marrow infiltration with high signal both on T1 and STIR images.

Normally, bone metastases with low T1 signal in existing bone marrow can be selected with high sensitivity. During the investigation of malignant melanoma metastasis, metastatic T1 high signal can be easily displayed on fat saturation or STIR imaging [4]. T1 high signal may be similar to bone marrow for this reason, it is useful to add STIR or fat saturated sequences. Post-contrast T1-weighted imaging with fat saturation increases the visibility of the lesion with normal bone marrow suppression.

In search of metastatic melanoma, we should keep in mind that high signal T1 lesions may be related to vertebral bone metastases. Also, the addition of fat suppression sequences is very important in the identification of vertebrae metastasis.

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*Corresponding author: Fatih Düzgün, Faculty of Medicine, Celal Bayar University, Güzelyurt mah. 5789 sok. Atlantis 2 sitesi C/2 Yunusemre, Manisa, Turkey, Tel: +90 5052529663; Fax: +90 236 2349070; E-mail: fatihdzgn@yahoo.com

Received April 04, 2017; Accepted April 19, 2017; Published April 21, 2017

Citation: Düzgün F, Ovalı GY, Tarhan S (2017) Rare Case of the T1 Hyperintense Vertebral Malignant Melanoma Metastasis. *J Spine* 6: 368. doi: 10.4172/2165-7939.1000368

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