

A rare presentation of multiple myeloma: Tc-99m MIBI SPECT imaging of orbital involvement

Multiple myeloma'nın nadir bir görünümü: Orbital tutulumun Tc-99m MIBI SPECT görüntülemesi

İlknur Ak Sivrikoz¹, Zafer Gülbaş²

¹Department of Nuclear Medicine, Osmangazi University Medical Faculty, Eskişehir, Turkey

²Department of Haematology, Osmangazi University Medical Faculty, Eskişehir, Turkey

Multiple myeloma (MM) is a plasma cell malignancy often associated with destructive skeletal lesions. Apart from calvarial infiltration, intracranial structures are very rarely involved by MM. Here we present the case of an extremely rare presentation of MM with orbital involvement. The case of a 57-year-old male presenting with proptosis, pain and redness in the left eye. MM had been diagnosed seven years previously. Ophthalmological examination revealed a diffuse swelling in the left periorbital and temporal region, pain, redness, proptosis and prominent limitation of left eye movements and bilateral optic disc oedema. Gadolinium–DTPA enhanced axial MR image (Fig 1) revealed a large myelomatous lesion with well-defined borders in the left frontal bone with associated soft tissue component. The lesion arising within the bone causing marked bony expansion and destruction, it displaces the brain parenchyma. The calvarial mass extends into the orbital compartments (Fig 2, T1-weighted). Tc-99m Sestamibi (MIBI) SPECT imaging (Fig 3, OM: Orbital mass, FM: Frontal mass) showed the increased activity corresponding to myelomatous lesion on left orbit and frontal bone. Histopathologic findings and further systemic examination confirmed the reactivation of the MM. Proptosis and visual acuity improved following external beam radiation therapy of the left orbit and repeated systemic chemotherapy.

Orbital involvement in multiple myeloma is very rare and has been described in the medical literature mainly as case reports of single patients. The incidence of myeloma as an orbital

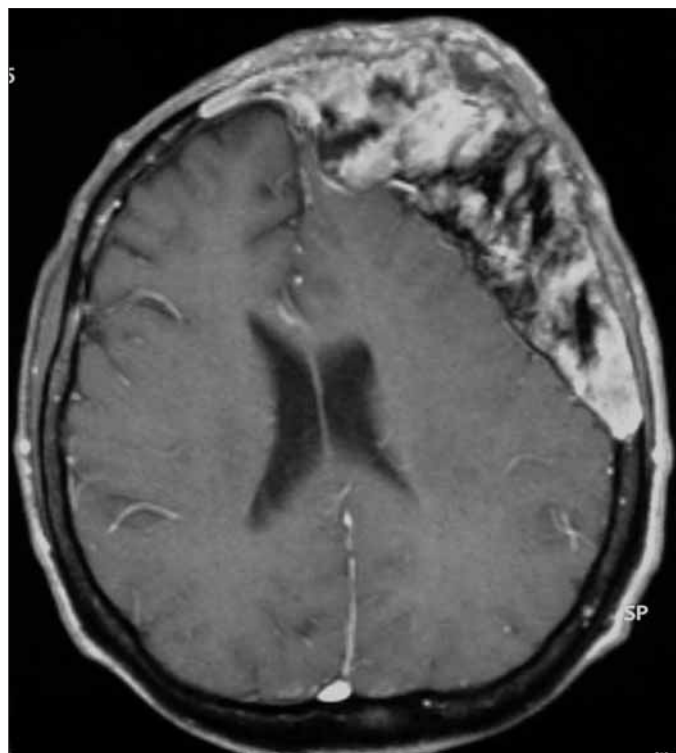


Figure 1. Gadolinium–DTPA enhanced axial MR image revealed a large myelomatous lesion with well-defined borders in the left frontal bone with associated soft tissue component

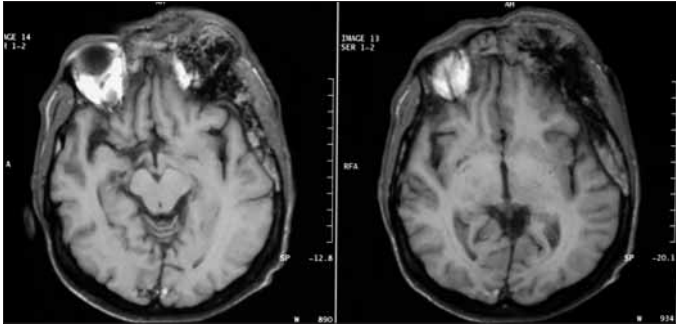


Figure 2. The calvarial mass extends into the orbital compartments on T1-weighted MRI

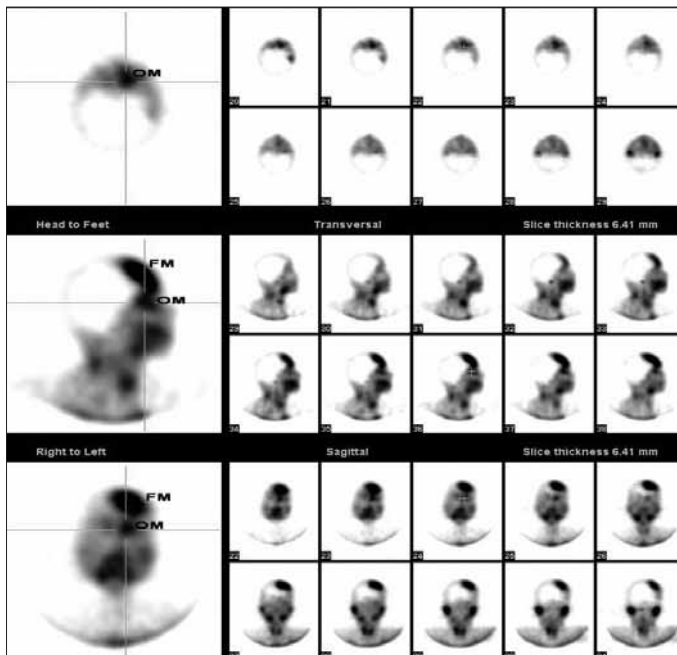


Figure 2. Tc-99m MIBI SPECT image of the cranium shows the increased activity corresponding to myelomatous lesion on left orbit and frontal bone (OM: Orbital mass, FM: Frontal mass)

tumour represents less than 1% of all orbital tumours [1-2]. Tc-99m MIBI imaging has been reported to be useful for the detection of a variety of tumours, including myeloma. In myeloma, uptake of Tc-99m MIBI reflects both activated mitochondria and the density of malignant plasma cells. Tc99m-MIBI uptake of lesion is related to percentage of plasma cell infiltration [3-7].

References

1. Fung S, Selva D, Leibovitch I, Hsuan J, Crompton J. Ophthalmic manifestations of multiple myeloma. *Ophthalmologica*. 2005;219(1):43-8.
2. Ajithkumar TV, Sivasankar C, Ramachandran K. Orbital multiple myeloma: case report and review of computed tomography features. *Australas Radiol*. 2002;46(1):119-20.
3. D'Sa S, Abildgaard N, Tighe J, Shaw P, Hall-Craggs M. Guidelines for the use of imaging in the management of myeloma. *Br J Haematol*. 2007;137(1):49-63.
4. Mele A, Offidani M, Visani G et al. Technetium-99m sestamibi scintigraphy is sensitive and specific for the staging and the follow-up of patients with multiple myeloma: a multicentre study on 397 scans. *Br J Haematol*. 2007;136(5):729-35.
5. Villa G, Balleari E, Carletto M et al. Staging and therapy monitoring of multiple myeloma by 99mTc-sestamibi scintigraphy: a five year single center experience. *J Exp Clin Cancer Res*. 2005;24(3):355-61.
6. Catalano L, Andretta C, Pace L et al. Tc99m-sestaMIBI uptake in nonsecretory multiple myeloma. *Hematology*. 2005;10(4):335-8.
7. Bacovsky J, Scudla V, Myslivecek M, Nekula J, Vytrasová M. Scintigraphy using (99m)Tc-MIBI (sestamibi), a sensitive parameter of activity of multiple myeloma. *Neoplasma*. 2005;52(4):302-6.