Interesting Image
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A Case of Extracranial Metastasis of Glioblastoma Multiforme Seen on Bone Scintigraphy

Kemik Sintigrafisinde Görülen Glioblastoma Multiforme'dan Ekstrakraniyal Metastaz Olgusu

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Abstract

Glioblastoma multiforme (GBM) is the most common primary malignant tumor of the central nervous system in adults. It is known for its devastating intracranial progress thus attributing to its very short survival. Here, we report a case of 37-year-old female with GBM post surgery, chemotherapy and radiotherapy who presented with pain in right hip region. She was referred to our department for evaluation of skeletal metastasis. Tc-99m methylene diphosphonate bone scan revealed an expansile lesion involving the right iliac blade along with extensive lytic bony lesions throughout the axial skeleton.

Keywords: Glioblastoma multiforme, bone scan, metastasis, Tc-99m MDP, extraosseous

Öz

Glioblastoma multiforme (GBM), erişkinlerde merkezi sinir sisteminin en sık görülen primer malign tümörüdür. Yıkıcı intrakraniyal gelişimi ve bu nedenle çok kısa bir hayatta kalma oranı ile bilinir. Bu çalışmada sağ kalça bölgesinde ağrı şikayeti ile başvuran, ameliyat, kemoterapi ve radyoterapi uygulanan 37 yaşındaki bir kadın GBM hastası sunuldu. İskelet metastazının değerlendirilmesi için bölümümüze sevk edildi. Tc-99m metilen difosfonat kemik taraması, aksiyel iskelet boyunca geniş litik kemik lezyonları ile birlikte sağ iliak kemiği kapsayan ekspansil bir lezyon ortaya çıkardı.

Anahtar kelimeler: Glioblastoma multiforme, kemik taraması, metastaz, Tc-99m MDP, ekstraosseöz

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Figure 1. A 37-year-old female, known case of glioblastoma multiforme (GBM) status post-surgery followed by adjuvant chemotherapy and radiotherapy presented to our hospital OPD with recent onset pain in the right hip region 1 year post surgery. Initial workup with contrast-enhanced magnetic resonance imaging brain revealed no residual or recurrent disease at the primary tumour site. Patient was referred to the nuclear medicine department for whole body skeletal screening. Tc-99m methylene diphosphonate (MDP) whole body bone scan in anterior and posterior views (A and B) revealed heterogeneous increased tracer uptake involving right iliac blade, right 7th rib and L2 lumbar vertebra.

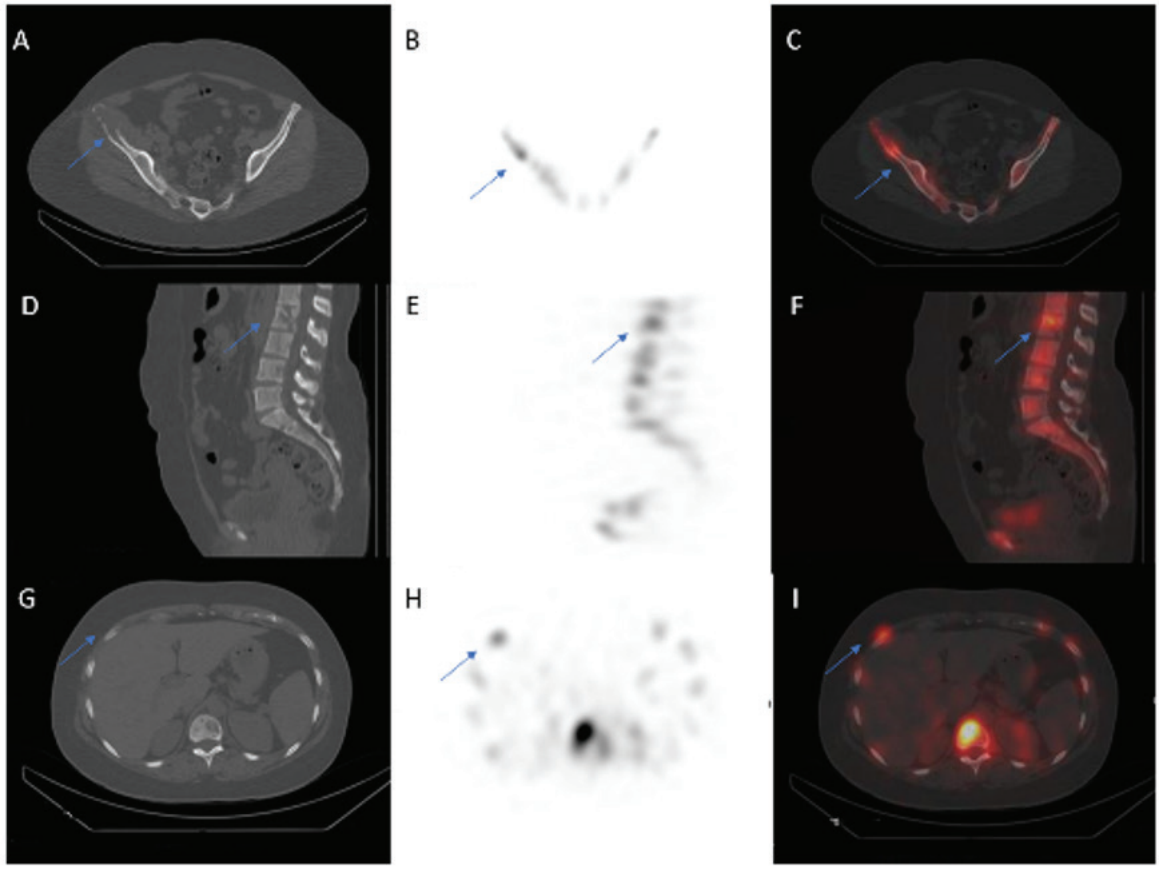

Figure 2. Thorax and pelvis with lumber region single photon emission computed tomography/computed tomography (SPECT/CT) was performed. The transaxial and sagittal CT, SPECT, fused SPECT/CT images of the lumbar region showed a lytic expansile lesion measuring 5x5 cm seen in the right iliac blade with soft tissue component (A, B, C). The lesion was infiltrating into the surrounding muscular structure. Multiple, well-defined lytic lesions involving left clavicle, left 7th rib, bilateral scapulae, bilateral pelvic bone, bilateral proximal femur, and multiple cervical, thoracic, lumbosacral, vertebrae were also seen on the CT images (D, E, F). A biopsy of the right iliac lesion was performed, which was suggestive of metastasis from GBM. GBM has an extracranial metastasis rate of 0.4-0.5% (1). Only limited cases have reported till now of extracranial metastasis of GBM (2,3,4,5,6,7,8). Radiotherapy has been suggested as one of the causes for the extracranial involvement of GBM caused by metaplasia of tumor cells and barrier breach (9). Disruption of dura due to surgery and certain chemotherapeutic agents has also been postulated as a causative factor for extracranial spreads of GBM (10,11). This case presented with multiple extracranial metastases 1 year post-surgery, and chemoradiotherapy. Extracranial metastasis, although being rare, should be considered a possibility in post-surgery, chemotherapy, and radiotherapy patients. Further research is required to determine whether ancillary therapy can have positive causation with extracranial metastasis and the role Tc-99m MDP bone scan plays in the evaluation of GBM patients.

Ethics

Informed Consent: Patient consent was obtained.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: H.V., V.D., Design: H.V., V.D., Data Collection or Processing: H.V., A.M., V.D., Analysis or Interpretation: H.V., A.M., V.D., Literature Search: H.V., A.M., V.D., Writing: H.V., A.M., V.D.

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References

1. Simonetti G, Silvani A, Fariselli L, Hottinger AF, Pesce GA, Prada F, Gaviani P. Extra central nervous system metastases from glioblastoma: a new possible trigger event? Neurol Sci 2017;38:1873-1875.
2. Seo YJ, Cho WH, Kang DW, Cha SH. Extraneural metastasis of glioblastoma multiforme presenting as an unusual neck mass. J Korean Neurosurg Soc 2012;51:147-150.
3. Ricard JA, Cramer SW, Charles R, Tommee CG, Le A, Bell WR, Chen CC, Flanagan E. Infratentorial glioblastoma metastasis to bone. World Neurosurg 2019;131:90-94.

4. Rossi J, Giaccherini L, Cavallieri F, Napoli M, Moratti C, Froio E, Serra S, Fraternali A, Ghadirpour R, Cozzi S, Ciammella P, Iaccarino C, Pascarella R, Valzania F, Pisanello A. Extracranial metastases in secondary glioblastoma multiforme: a case report. BMC Neurol 2020;20:382.
5. Sibanda Z, Farahani N, Ogbonnaya E, Albanese E. Glioblastoma multiforme: a rare case of spinal drop metastasis. World Neurosurg 2020;144:24-27.
6. Undabeitia J, Castle M, Arrazola M, Pendleton C, Ruiz I, Úrculo E. Multiple extraneural metastasis of glioblastoma multiforme. An Sist Sanit Navar 2015;38:157-161.
7. Shastin D, Mathew RK, Ismail A, Towns G. Cervical spinal glioblastoma multiforme in the elderly. BMJ Case Rep 2017;2017:bcr2016217742.
8. Forsyth TM, Bi WL, Abedalthagafi M, Dunn IF, Chiocca EA. Extracranial growth of glioblastoma multiforme. J Clin Neurosci 2015;22:1521-1523.
9. Rosen J, Blau T, Grau SJ, Barbe MT, Fink GR, Galldiks N. Extracranial metastases of a cerebral glioblastoma: a case report and review of the literature. Case Rep Oncol 2018;11:591-600.
10. Pietschmann S, von Bueren AO, Kerber MJ, Baumert BG, Kortmann RD, Müller K. An individual patient data meta-analysis on characteristics, treatments and outcomes of glioblastoma/ gliosarcoma patients with metastases outside of the central nervous system. PLoS One 2015;10:e0121592.
11. Beauchesne P. Extra-neural metastases of malignant gliomas: myth or reality? Cancers (Basel) 2011;3:461-477.