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Case Report

Ultra early cranial and spinal metastasis in a post-operative case of 4th ventricle medulloblastoma case: a case report

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ABSTRACT

Medulloblastoma is a type of brain tumour that occurs primarily in children and is relatively rare in adults. It has a tendency to spread through the cerebrospinal fluid pathways and can metastasize to other parts of the body, including the bones. Osseous extra-neural metastasis is uncommon, but the radiologic findings are usually sclerotic, lytic, or mixed when it occurs. In this paper, we present a case of medulloblastoma metastasizing to the cervical, dorsal and lumbar spine as well as intracranial spread and describe the magnetic resonance appearance of the lesion and also emphasize the importance of recognizing the imaging findings of metastatic lesions in patients with a history of medulloblastoma.

Keywords: Medulloblastoma, Spinal metastasis, Leptomeningeal spread

INTRODUCTION

In the past 20 years, the prognosis of medulloblastoma has significantly improved due to advancements in surgery, chemotherapy, and radiotherapy, as well as differences in treatment for localized versus metastatic disease.[1] Recent studies indicate that patients without metastasis, including cerebrospinal fluid spread, have an overall disease-free survival rate of 10 years. However, if extracranial metastases occur, bone involvement is the most common (80%), with the pelvis, long bones, and spine being the most frequently affected areas in descending order of frequency.[2]

CASE REPORT

A 7-year-old male presented with a sudden onset of headache, episodic vomiting, and difficulty walking. Neurological examination showed a cerebellar syndrome with no motor or sensory deficit.

Imaging studies, including computed tomography (CT) and magnetic resonance (MR) of the brain, revealed a large, well-circumscribed, and heterogeneous lesion located in the mid cerebellar hemisphere, measuring 4.1×2.5 cm, without tentorial attachment. The lesion appeared predominantly hyperdense on plain CT and had a heterogeneous low signal intensity on T1-weighted images, with nonhomogeneous central bright signal areas on T2-weighted images and fairly heterogeneous post-contrast enhancement. The cerebellar hemisphere, vermis and 4th ventricles were compressed, and there was a sharp interface between the lesion and brain.

The patient underwent surgery at the posterior fossa, during which the tumour was found to be soft and easily removable with suction. The tumour was clearly separated from the cerebellum, and the tentorium was free of any tumour, indicating an intra-axial lesion.

A frozen section of the tumour revealed the presence of malignant small round cells, and histopathological analysis showed the presence of nodules of small round cells with some neurocytic differentiation. The surrounding tissue was collagen-rich, which was indicative of a desmoplastic medulloblastoma. Following the surgery, the patient was sent for radiotherapy to but

patient did not turn for radiotherapy. The patient later developed fever, and altered sensorium and was hospitalised again.

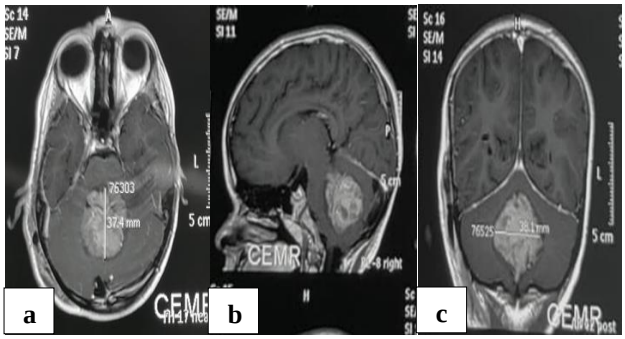

Figure 1 (a-c): Heterogeneous low signal intensity on T1-weighted images, and exhibited nonhomogeneous central bright signal areas on T2-weighted images, accompanied by fairly heterogeneous enhancement following contrast administration.

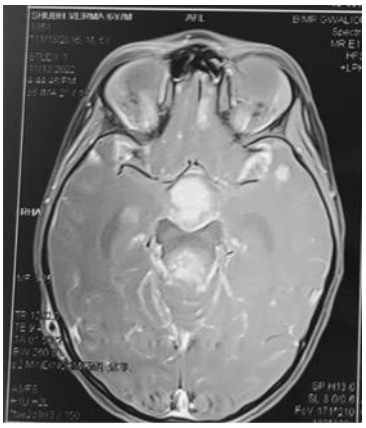

Figure 2: Post-op MRI-brain s/o. In a post-operative case of medulloblastoma present study shows residual/recurrent lesion in the 4th ventricle with associated leptomeningeal, parenchymal and suprasellar cistern metastases.

Contrast magnetic resonance imaging (MRI) brain with whole spines screening was done which showed residual/recurrent lesion in the 4th ventricle with associated leptomeningeal, parenchymal and suprasellar cistern metastasis.

There is evidence of multiple dural based enhancing lesions seen scattered in whole spine (cervical, dorsal and lumbar spine) with associated diffuse dural thickening suggestive of multiple drop metastases. The metastatic lesions are causing multifocal cord and thecal sac compression most significant at D2-D3, D11-D12 and L3 to 51 levels.

There is evidence of long segmental T2 hyperintensity seen in the cervical cord extending from cervico-medullary junction to C6 vertebral body level.

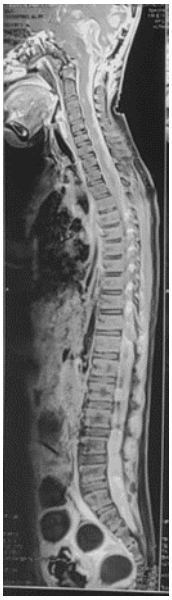

Figure 3: Post-operative MRI spine. The metastatic lesions are causing multifocal cord and thecal sac compression most significant at D2-D3, D11-D12 and L3 to S1 levels. There is evidence of long segmental T2 hyperintensity seen in the cervical cord extending from cervico-medullary junction to C6 vertebral body level.

DISCUSSION

Medulloblastoma, also known as a primitive neuroectodermal tumour originating in the cerebellum, comprises roughly 20% of childhood brain tumours and 1% of adult cases. It ranks third among central nervous system tumours prone to metastasizing systemically, following glioblastoma and meningioma.[3] The consensus among experts' points to a hematogenous route for its spread. Additionally, dissemination via shunt tubing has been documented, wherein tumor cells escape into systemic circulation due to breaches in the blood-brain barrier, often occurring during tumor surgery involving cerebrospinal shunt insertion.[4]

In the context of medulloblastoma, the timeline for the emergence of extraneural metastases following initial diagnosis is a critical consideration. Studies have revealed an average interval of 18 months, with notable instances of metastasis manifesting as late as 13 years post-diagnosis.[5,6] Our case adds to this discourse, demonstrating metastatic occurrence within 1 year after diagnosis.[7]

Notably, long-term survival prospects exist for adult patients undergoing treatment for medulloblastoma.[8] However, the prognosis is adversely affected in cases with metastasis at presentation.

Given the potential for delayed recurrence, diligent surveillance of all patients is imperative. Management of tumour recurrences demands a proactive approach, with aggressive therapeutic interventions yielding sustained

responses in select individuals. Adjuvant chemotherapy is recommended for high-risk patients, yet its efficacy in mitigating recurrences, particularly those of a distant nature, remains ambiguous within the standard-risk cohort.[9]

This underscores the necessity for further investigation into optimal therapeutic strategies tailored to the risk profiles of medulloblastoma patients.[10]

CONCLUSION

The incidence of systemic metastases in medulloblastoma patients is relatively low, with spinal involvement being particularly uncommon and sometimes mimicking spondylodiscitis on imaging. Unfortunately, therapeutic options for individuals with extra neural metastases are scarce, leading to a persistently poor prognosis despite ongoing efforts to improve treatment strategies.

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REFERENCES

1. Abacioglu U, Uzel O, Sengoz M, Turkan S, Ober A. Medulloblastoma in adults: treatment results and prognostic factors. Int J Rad Oncol Biol Physics. 2002;54(3):855-60.
2. Algra PR, Postma T, Van Groeningen CJ, Van der Valk P, Bloem JL, Valk J. MR imaging of skeletal metastases from medulloblastoma. Skeletal Radiol. 1992;21(7):425-30.
3. Millard NE, De Braganca KC. Medulloblastoma. J Child Neurol. 2016;31(12):1341-53.
4. Riffaud L, Saikali S, Leray E, Hamlat A, Haegelen C, Vauleon E, et al. Survival and prognostic factors in a series of adults with medulloblastomas. J Neurosurg. 2009;111(3):478-87.
5. Childhood cancer by the ICCC. In: Howlader N, Noone AM, Krapcho M, editors. SEER Cancer Statistics Review, 1975-2009 (Vintage 2009 Populations). National Cancer Institute. 2012.
6. Smoll NR, Drummond KJ. The incidence of medulloblastomas and primitive neurectodermal tumours in adults and children. J Clin Neurosci. 2012;19(11):1541-4.
7. Riffaud L, Saikali S, Leray E, Hamlat A, Haegelen C, Vauleon E, et al. Survival and prognostic factors in a series of adults with medulloblastomas. J Neurosurg. 2009;111(3):478-87.
8. Franceschi E, Giannini C, Furtner J, Pajtler KW, Asioli S, Guzman R, et al. Adult Medulloblastoma: Updates on Current Management and Future Perspectives. Cancers (Basel). 2022;14(15):3708.
9. Franceschi E, Minichillo S, Mura A, Tosoni A, Mascarin M, Tomasello C, et al. Adjuvant chemotherapy in average-risk adult medulloblastoma patients improves survival: a long term study. BMC Cancer. 2020;20(1):755.
10. Franceschi E, Hofer S, Brandes AA, Frappaz D, Kortmann RD, Bromberg J, et al. EANO-EURACAN clinical practice guideline for diagnosis, treatment, and follow-up of post-pubertal and adult patients with medulloblastoma. Lancet Oncol. 2019;20(12):e715-28.

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