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LARGE MENINGOTHELIAL MENINGIOMA IN A 27-YEAR-OLD PATIENT: CASE REPORT

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Abstract: *We report on the case of a 27- year-old male who presented right hemiparesis and gait disturbances. A large left parasagittal expansive process was detected on CT brain scan. Brain MRI delineated the solid, well circumscribed fronto-parietal mass. A provisional diagnosis of meningioma was made. Following a complete surgical resection of the tumour, a definitive diagnosis of WHO grade 1 meningothelial meningioma was determined based on histopathological findings. Postoperative CT brain scan confirmed that the tumour was completely resected. The patient was discharged with no motor deficit.*

INTRODUCTION

Meningiomas represent a broad and heterogeneous group of tumours. These dural-based tumours, that originate from arachnoid cap cells, are the most commonly encountered primary central nervous system tumours in adults (~37% of all intracranial lesions). Most of them have supratentorial localisation – parasagittal, falcine, skull base. They are relatively rare under the age of 18 years, most of them occurring over the age of 65 years. The female-male ratio is ~ 3:1.(1)

According to the World Health Organization, meningiomas are classified into 3 grades based on histologic features: grade 1 (~80%) – benign meningiomas, grade 2 (~18%) – atypical lesions and grade 3 (~2%) – anaplastic, malignant lesions.(2)

The clinical manifestations are dependent on localisation and size of the tumours. Some patients may be asymptomatic and others may experience neurologic deficit. Brain MRI is the gold standard investigation for diagnosing meningiomas.(3)

Certain conditions and risk factors have been associated with developing a meningioma: obesity, alcoholism, ionizing radiation exposure, hormonal factors such as hormonal replacement therapy and oral contraceptive pills, breast cancer etc.(4)

CASE REPORT

Mr. P.P. is a 27 year-old man with history of alcohol abuse, diagnosed with epilepsy in 2016 in chronic treatment with Carbamazepine, who presents in the Neurosurgery Department of Sibiu in February 2022 with right hemiparesis and gait disturbances. The symptoms began insidiously about 2 months prior to admission with progressive lower limb weakness followed by upper limb involvement.

Neurologic examination revealed right hemiparesis (lower limb>upper limb), loss of distal movement of the right lower limb, positive Babinski sign and brisk deep tendon reflexes on the right.

A brain CT scan was performed (figure no. 1) which outlines a left fronto-parietal parasagittal expansive process. It was followed by an MRI investigation which outlines a left fronto-parietal mass, well circumscribed, measuring 90/50/60 cm (AP/LL/CC) with Gadolinium retention, minimal mass effect and no peripheral edema (figure no. 2).

Figure no. 1. Initial CT brain scan: sagittal, coronal and axial view

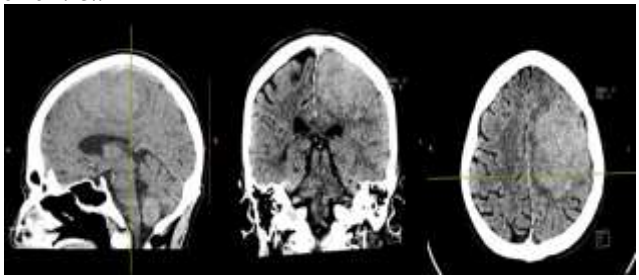

Figure no. 2. Brain MRI in sagittal T2-weighted, axial and coronal T1-weighted image

Surgical treatment was indicated in this patient. Informed consent was obtained from the patient and his family. The patient underwent a left fronto-parietal craniotomy with complete resection of the tumour mass. During surgery, the tumour was identified to be attached to the dura mater. The resection surgery was uneventful.

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At the macroscopic level the resected tumour was composed of multiple grayish fragments of elastic consistency sizing between 40/20/10 mm and 60/50/55 mm (figure no.3). A biopsy was performed and the histopathological report showed tumour proliferation with solid architecture, made of relatively large-sized cells with discrete pleomorphism: with oval nuclei and fine chromatin, small nucleoli and cytoplasmic inclusions, forming whorls and some psammoma bodies. It is organized in small lobules separated by conjunctival septa. This aspect pleads for a WHO grade 1 meningothelial meningioma.

Figure no. 3. Macroscopic aspect of the tumour

Postoperative evolution was satisfactory, no complications had occurred, and patient had his symptoms considerable improved. Neurologic examination showed no more hemiparesis with total recovery of the distal movement of the lower right limb, but with positive Babinski sign on the right still present (figure no. 4). The patient was discharged after 5 days postsurgery with significantly improved neurologic status.

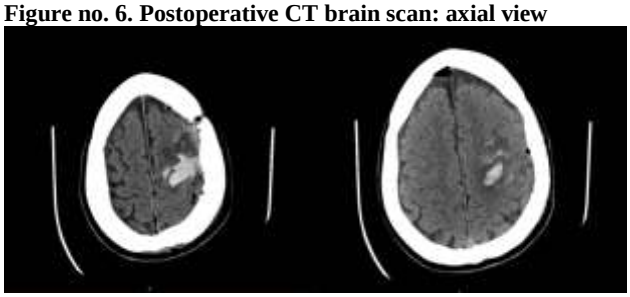
Figure no. 4. Neurologic examination after surgery

For tumour resection, the surgical team performed a fronto-parietal craniotomy. The necessary steps were: scalp incision followed by bone flap removal for accessing the area, hemostasis, incision of dura mater and removal of the tumour without affecting the nearby healthy brain tissue followed by reattachment of the bone flap, suture of the scalp incision and drain fixation. During the surgery it was discovered that the dura mater was adherent to the tumour process (figure no. 5).

Figure no. 5. Intraoperative steps

CT scanning 24 hours after surgery confirmed that the tumour mass was completely resected. It can be observed that the high-density mass presented in the preoperative CT was replaced by a hypo-density signal in the postoperative CT scan. It also outlines the presence of an intraparenchymal hematoma of 3,4/2/2,8 cm (LL/AP/CC), with peripheral edema and frontal bilateral pneumocephalus (figure no. 6).

Figure no. 6. Postoperative CT brain scan: axial view



DISCUSSIONS

According to WHO, Grade 1 meningioma is the most frequent type, frequency of 80-85% and it is considered benign. From all histopathological types of meningioma, meningothelial is one of the most common.

While there are no pathognomonic symptoms of meningioma, the clinical presentation of this case was typical for fronto-parietal distribution of the process with impairment of motor function of the contralateral limbs.

The patient history of epilepsy can be either corelated with the presence of the mass, or a consequence of alcohol abuse related by the patient.

The most efficient way to diagnose a meningioma is by imagining, especially magnetic resonance imaging. Normally, meningiomas are hyperintense on T2 and FLAIR sequences and isointense on T1. For those that cannot undergo MRI, contrast enhanced CT should be considered. On CT, bony changes, such as hyperostosis can be present and intralesional calcification is common. Another common feature is the involvement of cerebral vascularization, particularly for skull base meningiomas. On molecular level because of the expression of somatostatin receptor 2, meningiomas can be detected on PET examination after injection of somatostatin analogues.

According to WHO grade I meningioma has 9 histologic subtypes: meningothelial, fibrous, transitional, psammomatous, angiomatous, microcystic, secretor, metaplastic, lymphoplasmacyte rich. Grade I is characterized by low mitotic rate and absence of brain invasion.

Regarding the treatment, the medical decision between conservative and surgical intervention is based on the clinical presentation of the patient. For those with asymptomatic meningiomas it is acceptable periodic observation and imagining surveillance. If the size of the tumour is growing fast and the patient develops symptoms, the proper management is surgical resection.

The goal of meningioma treatment is complete resection of the tumour. If the surgery is not an option than stereotactic radiosurgery should be considered.(5)

The principles of this kind of surgery are maximum safe resection with low morbidity and no involvement of neurological functions. Although the focus is gross total resection, the extent of resection is determined by a series of tumour factors such as location, dimensions, consistency, involvement of important neurovascular structures. While the extent of resection is a critical factor regarding recurrence, achieving this goal should not be at the expense of neurological

function. In such situations, where the complete resection of the tumour is not possible, a subtotal resection should be considered to allow the preservation of neurological function. After this step, residual meningioma can be treated with postoperative fractionated radiotherapy or stereotactic radiosurgery.(6)

The aim of successful surgery is the improvement of neurologic medical condition, maximum resection of the tumour and biopsy provider. Before any decision is made, the patient should be informed about the risks of the intervention.

The role of pharmacotherapy is still not very well known, but there were partial responses to multikinase inhibitors.(7) For meningioma grade 1, with AKT mutations, AKT inhibitors can be considered.(8) Other agents did not show efficiency and clinical trials on targeted therapy have not been yet completed.(9)

REFERENCES

1. Toland A, Huntoon K, Dahiya SM. Meningioma: A Pathology Perspective. Neurosurgery. 2021;89(1):11–21.
2. Buerki RA, Horbinski CM, Kruser T, Horowitz PM, James CD, Lukas RV. An overview of meningiomas. Future Oncol. 2018 Sep;14(21):2161-2177.
3. Lim YS, Kim MK, Park BJ, Kim TS, Lim YJ. Long term clinical outcomes of malignant meningiomas. Brain Tumor Res Treat. 2013 Oct;1(2):85-90.
4. Wiemels J, Wrensch M, Claus EB. Epidemiology and etiology of meningioma. J Neurooncol. 2010 Sep;99(3):307-14.
5. Ruge MI, Tutunji J, Rueß D, Celik E, Baues C, Treuer H, Kocher M, Grau S. Stereotactic radiosurgery for treating meningiomas eligible for complete resection Radiat Oncol. 2021;16:22. https://doi.org/10.1186/s13014-021-01748-y.
6. Goldbrunner R, Stavrinou P, Jenkinson MD, Sahm F, Mawrin C, Weber DC, Preusser M, Minniti G, Lund-Johansen M, Lefranc F, Houdart E, Sallabanda K, le Rhun E, Nieuwenhuizen D, Tabatabai G, Soffietti R, Weller M. EANO guideline on the diagnosis and management of meningiomas. Neuro-Oncology. 2021;23(11):1821–1834. https://doi.org/10.1093/neuonc/noab150.
7. Kaley T, Barani I, Chamberlain M, et al. Historical benchmarks for medical therapy trials in surgery- and radiation-refractory meningioma: a RANO review. Neuro Oncol. 2014;16(6):829–840.
8. Weller M, Roth P, Sahm F, et al. Durable control of metastatic AKT1-mutant WHO grade 1 meningothelial meningioma by the AKT inhibitor, AZD5363. J Natl Cancer Inst. 2017;109(3):1–4.
9. Preusser M, Brastianos PK, Mawrin C. Advances in meningioma genetics: novel therapeutic opportunities. Nat Rev Neurol. 2018;14(2):106–115.