Case report

Intracranial plasmacytoma presenting as glioblastoma multiforme

Plasma cell tumors are a heterogeneous group of neoplasms that includes multiple and isolated plasmacytomas and other immunoproliferative diseases. An extremely uncommon form of the disease are solitary extramedullary plasmacytomas (SEPs) of the central nervous system (CNS) which account for less than 1% of all malignant tumors and about 14% of hematological malignancies.

A 37-year-old man came to the casualty department due to generalized seizures and a several-week history of a numbness of the left shoulder and left upper limb. Apart from severe obesity (weight 140 kg), he was otherwise healthy. Computed tomography (CT) of the head revealed a contrast-enhanced mass of 2.5 cm in diameter with surrounding edema in the right hemisphere. The patient was administered an anti-edema treatment and a control CT revealed a contrast-enhancing mass with dimensions of 37 mm × 32 mm × 36 mm surrounded by extensive edema (Fig. 1A) which strongly suggested glioblastoma multiforme (GBM). Due to the radiological picture and the lack of response to the anti-edematous treatment the patient was referred to the urgent surgery (radical resection of the tumor) without any other preliminary diagnostics (MRI or biopsy). Surprisingly, the histopathological examination of the surgical specimen revealed the features of plasmacytoma showing immunoreactivity for CD138 (Fig. 1B), CD79A, CD3, GFAP, Ki67, vimentin, and CD10 and no reactivity for CD20, BCL6 and CD31. The bone marrow biopsy, bone scintigraphy as well as blood (calcium, β2-microglobulin, albumin, M-protein) and urine (M-protein) tests did not show any pathology.

Three months after the resection a control magnetic resonance imaging (MRI) of the head showed a 23 mm × 16 mm × 21 mm tumor with an irregular marginal contrast enhancement corresponding to either post-operative changes or a residual/recurrent mass (Fig. 1C). The positron emission tomography with 2-deoxy-2-[fluorine-18]-fluoro-D-glucose integrated with the computed tomography (18F-FDG PET/CT) did not reveal any other CNS pathology except of an enhanced glucose uptake (SUV 1.5) around the mass which indicated post-operative changes (Fig. 1D).

The patient was scheduled for radiotherapy to the volume of the post-operative pathological mass (contrast enhanced on

Fig. 1 – (A) CT scan showing contrast-enhanced tumor surrounded by an extensive edematous zone. (B) CD138 expression in the tumor (100×). (C) MRI after tumor resection showing surgical bed and irregular marginal contrast enhancement. (D) PET-CT scan showing enhanced glucose uptake at the site of tumor resection.

Keywords:
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Surgery
Radiation therapy
Combined therapy
MRI and of increased tracer uptake in 18F-FDG PET/CTJ with a 2 cm margin of normal tissues and irradiated with 6 MV X-rays to a total dose of 45 Gy in 28 fractions. At the admission to the radiotherapy department, after a several week rehabilitation the patient’s performance status was good (KPS 100) and did not change during irradiation. The treatment tolerance was monitored weekly based on the EORTC/RTOG post-radiation complications scale. At the completion of radiotherapy the skin reaction was estimated as a 1st degree complication; the CNS, eyes and cochlea did not present any acute complications. In contrast to SEPs the tumor can be considered in patients with diffuse lesions or locally established. The literature suggests an optimal dose in tumors measuring less than 5 cm in diameter – 40 Gy in 20 fractions. Nevertheless, three patients in another case series recovered after either radical or subtotal resection of CNS SEPs patients are better candidates for radiotherapy [7]. Nevertheless, three patients in another case series recovered after either radical or subtotal resection of CNS SEPs although two of them did not receive adjuvant radiotherapy [5]. Our experience suggests that some CNS SEPs indicate radiologically other malignancies and, consequently, an elective surgery is appropriate in patients with resectable lesions.

Radiotherapy is a well-established adjuvant treatment but should also be considered a radical treatment for non-resectable tumors [2]. A dose–response relationship has not been unequivocally established. The literature suggests 40 Gy in 20 fractions as an optimal dose in tumors measuring less than 5 cm in diameter and 50 Gy in 25 fractions for larger masses [8]. The irradiated volume usually includes the mass or its surgical bed with a 2–3 cm margin [3]. Radical whole-brain radiotherapy with a total dose of 36 Gy and up to 45 Gy boost to the tumor can be considered in patients with diffuse lesions or in those ineligible for a surgery [1].

**Conflict of interest**

None declared.

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### Table 1 – Clinical data of patients presenting with intracranial plasmocytoma.

<table>
<thead>
<tr>
<th>Age(years)/sex</th>
<th>Symptoms</th>
<th>Localization</th>
<th>Treatment</th>
<th>Bone flap inv.</th>
<th>Progression to MM</th>
<th>Follow-up</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>50/F</td>
<td>Motor aphasia</td>
<td>Left temporal lobe and thalamus</td>
<td>RT alone</td>
<td>No</td>
<td>No</td>
<td>48 mos</td>
<td>[1]</td>
</tr>
<tr>
<td>51/F</td>
<td>Diplopia</td>
<td>Pituitary/sphenoid</td>
<td>Surgery + RT</td>
<td>No</td>
<td>No</td>
<td>8 yrs</td>
<td>[5]</td>
</tr>
<tr>
<td>51/F</td>
<td>Mental status change</td>
<td>Left parietal lobe</td>
<td>Surgery + RT</td>
<td>Yes</td>
<td>No</td>
<td>2 yrs</td>
<td>[5]</td>
</tr>
<tr>
<td>43/F</td>
<td>Headache</td>
<td>Falx</td>
<td>Surgery + RT</td>
<td>No</td>
<td>No</td>
<td>8 yrs</td>
<td>[5]</td>
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<tr>
<td>30/M</td>
<td>Headache</td>
<td>Clivus-dural</td>
<td>Surgery + RT</td>
<td>Yes</td>
<td>Yes</td>
<td>3 mos</td>
<td>[5]</td>
</tr>
<tr>
<td>47/M</td>
<td>Headache</td>
<td>Right parietal lobe</td>
<td>Surgery + RT</td>
<td>Yes</td>
<td>No</td>
<td>25 yrs</td>
<td>[5]</td>
</tr>
<tr>
<td>65/M</td>
<td>Hemiaparesis</td>
<td>Right parietal lobe</td>
<td>Surgery alone</td>
<td>No</td>
<td>No</td>
<td>1 mo</td>
<td>[5]</td>
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<tr>
<td>75/M</td>
<td>Vertigo, hoarseness, swallowing difficulty</td>
<td>Left posterior</td>
<td>Surgery + RT</td>
<td>Yes</td>
<td>Yes</td>
<td>4 yrs</td>
<td>[5]</td>
</tr>
<tr>
<td>82/F</td>
<td>Mental status change</td>
<td>Left parietal lobe (1) Frontal mass adjacent to the cerebral falx (2) in diploe</td>
<td>Surgery alone</td>
<td>Yes</td>
<td>Yes</td>
<td>6 mos</td>
<td>[5]</td>
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<tr>
<td>64/M</td>
<td>Seizures, hemiparesis</td>
<td>Right parietal lobe</td>
<td>Surgery + RT</td>
<td>Yes</td>
<td>Yes</td>
<td>5 mos</td>
<td>[6]</td>
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<tr>
<td>37/M</td>
<td>Seizures, hemiparesis</td>
<td>Right temporal lobe</td>
<td>Surgery + RT</td>
<td>No</td>
<td>No</td>
<td>26 mos</td>
<td>Our study</td>
</tr>
</tbody>
</table>

Abbreviation: RT – radiation therapy.
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REFERENCES