Intradiploic meningioma of the skull: Case report and review of the literature


Summary

An intraosseous calvarial meningioma appeared as a solitary lytic lesion on the plain X ray of the skull. The computerized tomography (CT) of the head showed the lesion confined to the diploe. Only three cases of totally osteolytic intraosseous meningiomas are described in the literature. This is the first case with a CT clearly showing the tumor confined to the bone. It is also the only one with a follow-up magnetic resonance (MR) showing no skull or intracranial tumor.


Case report

A 30 year old man referred a slowly growing lump, slightly painful, in the left parietal region. He related his complains to a mild head injury three months before, and he also referred a mild head injury over the same localization when a child.

On examination, there was a palpable mass in the left parietal region with 2.5 cm in diameter. The skin was not adherent to the mass that seemed to involve the bone. The physical and neurological examination showed no abnormalities. Chest roentgenogram and laboratory investigation were normal. The skull roentgenogram showed an osteolytic lesion with irregular margins 1.5x3 cm (Fig. 1). Computerized tomography (CT) of the head showed an intradiploic hipodense lesion that deformed both tables without eroding them (Fig. 2). A left parietal skin flap centered to the lesion was fashioned. The periosteum was intact and the lesion was seen

(MR) showing no tumor in the skull or intracranial. Metastatic carcinoma, myeloma, hemangioma, eosinophilic granuloma and epidermoid are diagnosis that come first to our mind when confronted with a solitary osteolytic lesion.

Fig. 1.– Plain skull X ray revealing an osteolytic lesion with irregular margins in the parietal region.
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Fig. 2—Computerized tomography (bone window) showing the tumour inside the diploe with both tables deformed.

immediately below. A burr hole was placed close to the lesion that was removed piecemeal. Both tables were paper thin. A greyish amorphous mass was completely removed leaving a normal underlying dura. The cranial defect was reconstructed with methyl methacrylate.

The postoperative course was uneventful. Eight months later a follow-up magnetic resonance (MR) of the head, did not show any skull or intracranial tumor (Fig. 3).

On pathological examination tumor was composed by massive areas of psammomas bodies, with small meningotheliomatous nests supported by a connective stroma (Fig. 4). The image was typical of a psammomatous meningioma.

Discussion

It is generally accepted that meningiomas have their origin in arachnoid cells7, 9, 15, 17. There is a great resemblance between the fine structure of meningioma and arachnoid cells4.

Ectopic meningiomas outside the meninges, are frequently reported in the literature1, 2, 3, 5, 6, 16, 19, 20. In the head they tend to occur along the cranial nerves. This may be explained by the presence of clusters of arachnoid cells4, 9.

Primary intrasosseous meningiomas of the skull associated with osteolytic lesions are rarely reported9, 5, 17. Most of these meningiomas are associated with osteoblastic lesions3, 18, 21. To our knowledge there are only three reports of totally intrasosseous meningiomas associated with osteolytic lesions (Table 1). That a meningioma can cause an osteolytic lesion instead of the common osteoblastic reaction was recognized by Cushing, although he did not mention any case of intrasosseous meningioma in a group he designed as «Meningioma without dural attachment»9. McWhorter in 1976 was the first author to report a case of an osteolytic meningioma entirely intrasosseous11. Husaini's case in 1969 and McWhorter's case in 1976 were the first reports of osteolytic meningiomas, but the case of Husaini had dural involvement9. Pearl in 1979 published the second case of a totally intrasosseous osteolytic meningioma9. Lee and Kaneko in 1988 published two cases of intrasosseous meningiomas with osteolytic lesions, both cases had extrasosseous involvement11, 13. Ghobashy 1994 reported the third case of a totally intrasosseous meningioma with an osteolytic lesion9.

<table>
<thead>
<tr>
<th>Authors &amp; year</th>
<th>Age (yrs)</th>
<th>Sex</th>
<th>Tumor location</th>
<th>Histological findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>McWhorter, et al, 1976</td>
<td>42, M</td>
<td></td>
<td>Left temporal</td>
<td>Psammomatous</td>
</tr>
<tr>
<td>Pearl, et al, 1979</td>
<td>44, F</td>
<td></td>
<td>Right frontal</td>
<td>Meningotheliomatous</td>
</tr>
<tr>
<td>Ghobashy, et al, 1994</td>
<td>65, F</td>
<td></td>
<td>Right frontal</td>
<td>Transitional</td>
</tr>
<tr>
<td>Present case</td>
<td>30, M</td>
<td></td>
<td>Left parietal</td>
<td>Psammomatous</td>
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</tbody>
</table>
There are several possible explanations for the origin of these intraosseous lesions, without dural contact. Arachnoid cells may be trapped in a suture during embryological development, during delivery or may be captured in the bone during a fracture. A significant number of patients with a meningioma have a history of trauma in the same region of the meningioma. In Cushing series 93 from 295 meningiomas had a history of trauma. Our patient referred a mild head trauma three months before he became symptomatic. As the meningioma was not near a suture a possibility is that it resulted from the head injury. The problem of a link between head trauma and subsequent brain tumors is not only a classical discussion but also a legal one. There are good studies denying this relation although there are also good reports showing a link. Zulch proposed some criteria to evaluate posttraumatic tumors and we consider that our case does not meet those criteria because the head trauma was mild and the time interval between the trauma and the development of the tumor was short.

Conclusion

It’s our opinion that this meningioma had an intraosseous origin. In fact the CT of the head shows clearly the meningioma confined to the parietal bone without dural contact and the follow-up MR didn’t show any skull or intracranial tumor.

The reason for the intraosseous localization of the meningioma remains unclear because the tumor was not near a suture and there was only a mild head injury.

Most of the primary intraosseous meningiomas of the skull are associated with osteoblastic lesions. Only three cases of totally intraosseous osteolytic meningiomas are described in the literature. Are these lesions really rare or rarely reported?

References

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