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Prostate carcinoma mimicking a sphenoid wing meningioma

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ABSTRACT

INTRODUCTION: We report here on a rare case of a large, lateral sphenoid wing tumor with radiographic and intraoperative findings highly suggestive of meningioma, yet pathology was in fact consistent with metastatic prostate adenocarcinoma.

PRESENTATION OF CASE: An 81 year-old male presented with expressive dysphasia, right-sided weakness and headaches. Imaging revealed a heterogeneously-enhancing lesion based on the left lateral sphenoid wing. The presumed diagnosis was strongly in favor of meningioma, and the patient underwent complete resection of the dural-based lesion. Final pathology confirmed the unexpected finding of a metastatic prostate adenocarcinoma. Although he tolerated surgery well, the patient was subsequently referred for palliative therapy given findings of widespread systemic disease.

DISCUSSION: Intracranial metastases may involve the dura, at times presenting with rare radiographic features highly suggestive for meningioma, as in our case here. This makes differentiation, at least based on imaging, a challenge. Elderly patients presenting with neurological deficits secondary to a newly-diagnosed, dural-based lesion should thus be considered for metastasis, prompting additional imaging studies (including body CT, MRI or PET) to rule out a primary lesion elsewhere. In some cases, this may affect the overall decision to proceed with surgical resection, or alternatively, to proceed directly to palliative therapy (the latter decision made in the context of widespread metastatic disease).

CONCLUSION: We conclude that dural-based metastatic lesions may mimic meningiomas, warranting thorough pre-operative work-up to exclude the possibility of metastasis. In certain cases, identification of widespread disease might preclude surgery and favor palliation, instead.

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1. Introduction

Radiographic features do not necessarily differentiate between meningiomas and metastatic dural-based tumors, particularly in the elderly patient. We report here on a rare case of a large, lateral sphenoid wing tumor with radiographic and intraoperative findings highly suggestive of meningioma, yet pathology was in fact consistent with metastatic prostate adenocarcinoma. In an otherwise healthy patient with no prior history for malignancy, and given the location of this expansive lesion within the lateral sphenoid wing, the finding of prostate metastasis was unexpected. This case highlights the importance of also considering metastasis during the work-up of an elderly patient with a new dural-based lesion that strongly mimics meningioma (based on radiographic studies), and should prompt additional body imaging to rule out widespread disease in the majority of such cases.

2. Case report

An otherwise healthy, highly functioning, 81 year-old, right-handed male presented with a two month history of expressive dysphasia, progressive right-sided weakness and headaches. Imaging revealed a large, well-demarcated, heterogeneously-enhancing lesion based on the left lateral sphenoid wing, with evidence of a dural tail attachment and subtle plaque-like hyperostosis along the squamosal temporal bone (Fig. 1A–E). The presumed diagnosis was strongly in favor of meningioma, and the patient underwent complete resection of the dural-based lesion. Intra-operatively, the lesion was red-brown and highly vascular, with evidence for overlying bony invasion. Final pathology in this case confirmed metastatic prostate adenocarcinoma (Fig. 1F). Given the pathological diagnosis, subsequent imaging with body CT and MRI identified pulmonary nodules, retroperitoneal lymphadenopathy and extensive osseous involvement of the entire spine, with a concomitant epidural tumor mass at T5 resulting in moderate canal stenosis (with no cord compression or edema). With this confirmation of stage IV metastatic disease, the patient was referred to medical and radiation oncology for adjuvant palliative therapy.

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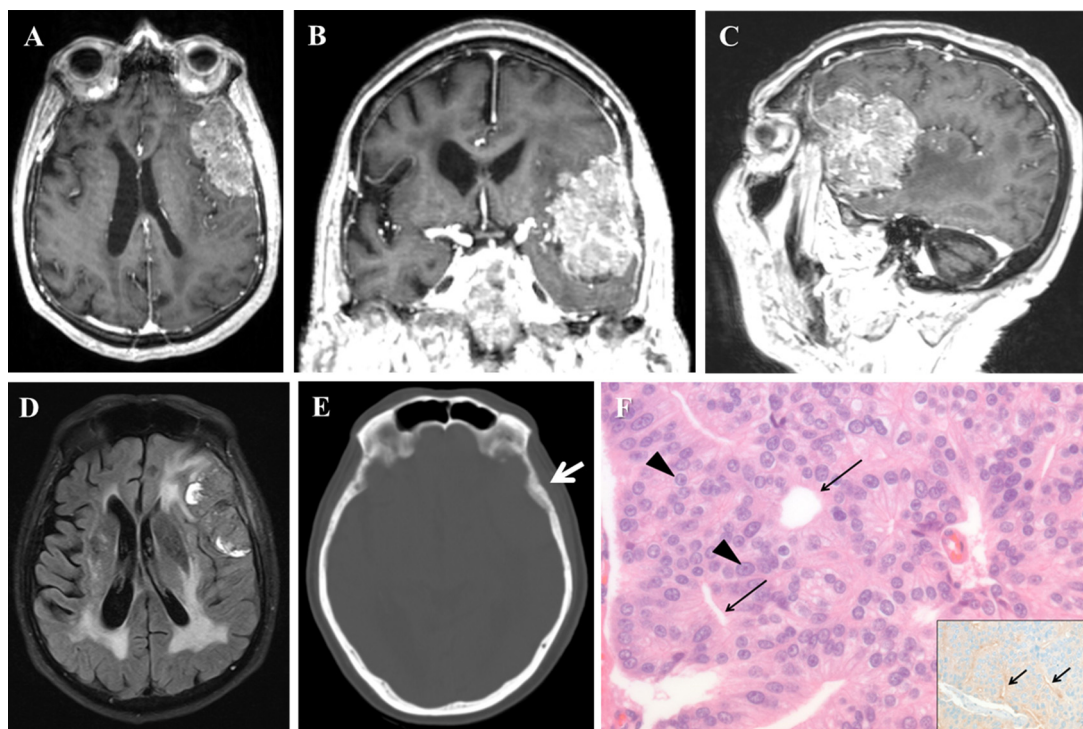


Fig. 1. Imaging and pathology features of a dural-based lesion in the left sphenoid wing.

(A–C) Axial, coronal and sagittal T1-weighted, contrast-enhanced MR images revealing a $6 \times 5 \times 4$ cm dural-based, enhancing lesion centered on the pterion. (D) Axial T2-FLAIR sequence illustrating lesion isointensity and peripheral cystic changes. (E) Non-contrast CT (bone window) revealing a subtle, plaque-like region of hyperostosis along the inner table of the left squamosal temporal bone (white arrow). (F) Pathological findings of meningeal infiltration showing adenocarcinoma with acinar formations (arrows) and no definitive neuroglial tissue identified therein. Small nucleoli were present in many nuclei (arrowheads) (H&E; original magnification: $400\times$). Of note, immunohistochemistry revealed positive staining for pancytokeratin, PSAP and PSA. The latter (inset) showed weak cytoplasmic and strong apical (arrows) staining (immunohistochemistry; original magnification: $400\times$). These findings were supportive of a prostatic origin for this metastatic adenocarcinoma.

3. Discussion

Intracranial dural metastases affect approximately 9% of patients with systemic cancer, with nearly one-fifth accounted for by metastatic prostate cancers [1]. Such lesions may involve the dura, at times presenting with rare radiographic features highly suggestive for meningioma [2,3]. This makes differentiation, at least based on imaging, a challenge. This phenomenon is exemplified by our case, wherein the radiographic findings were impressive and highly suggestive for meningioma, including intense contrast-enhancement, T2-FLAIR isointensity with peripheral cystic changes, and underlying hyperostotic features. However, our case is unique in that metastatic lesions are generally much smaller and often arise in the context of a known history of malignancy (as opposed to an otherwise healthy patient, as was the case here). Moreover, metastatic lesions arise in atypical locations for a meningioma; as illustrated by our case, the lateral sphenoid wing is a very rare site of predilection for prostate metastases, as evidenced by only one other report in the literature [4]. Unfortunately, advanced prostate cancer patients with dural metastases have been reported to have poor overall prognosis and survival [5]. In this context, elderly patients presenting with neurological deficits secondary to a newly-diagnosed, dural-based lesion should be considered for metastasis, prompting additional imaging studies (including body CT, MRI or PET) to rule out a primary lesion elsewhere. In some cases, this may affect the overall decision to proceed with surgical resection, or alternatively, to proceed directly to palliative therapy (the latter decision made in the context of widespread metastatic disease).

4. Conclusion

This case illustrates the unexpected pathological finding of a dural-based metastasis (prostate adenocarcinoma) arising from the lateral sphenoid wing of an elderly patient, that strongly resembled a meningioma on pre-operative neuroimaging studies. Here, the patient tolerated resective surgery well; unfortunately, once the pathology was identified, subsequent body imaging revealed widespread metastatic disease, thereby prompting palliative referral. We conclude that dural-based lesions in the elderly that are radiographically suggestive for meningioma still warrant consideration for the possibility of metastasis, often necessitating a more thorough work-up to include additional body imaging studies. For a smaller, relatively asymptomatic, dural-based metastatic lesion mimicking a meningioma, the consequences of “watching and waiting” may be significant, in fact. Moreover, the preoperative identification of widespread metastatic disease, in certain cases, might preclude surgical intervention and favor a more palliative approach.

Conflict of interest

Nothing to declare.

Sources of funding

Nothing to declare.

Ethical Approval

Nothing to declare, as this is a single case report. At our centre, we do not require ethical review by the Institutional Review Board for single case report studies (I have inquired into this already).

Consent

Written informed consent was obtained from the patient's wife (given that the patient is deceased), for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Lucas H Bradley – Helped with study concept, data collection, interpretation and writing the paper. Matthew R Burton – Assisted with writing the paper and review of the final draft. Murat Gokden – Contributed to data collection, interpretation and review of the final draft of the paper. Demitre Serletis – Contributed to study concept/design, data collection, data analysis and interpretation, initial draft, review of the final manuscript and final submission of the paper.

Research Registry

Not applicable – this is a single case report, not a systematic review or meta-analysis. Moreover, we attest that it is not a 'first in man' study, either.

Guarantor

Guarantor = Dr. Demitre Serletis

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