Case 1294
Intracranial multiple meningiomas with different radiological findings and histological types

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Section: Neuroradiology
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Patient: 65 year(s), male

Clinical History

The patient was referred to hospital with forgetfulness and speech and gait disorders. Physical examination revealed right hemiparaesia and mixed aphasia. Cranial MR examination showed two extraaxial mass lesions at different locations.

Imaging Findings

The patient was referred to hospital with forgetfulness and speech and gait disorders. Physical examination revealed right hemiparaesia and mixed aphasia. Cranial MR examination showed two extraaxial mass lesions at different locations.
One of these appeared on the greater wing of the sphenoid bone, protruding to the left side of the middle cranial fossa and showing hyperintensity in T2-weighted sequences when compared with the brain parenchyma. The other lesion, which was validated to be highly calcified because of its marked hypointensity in all pulse sequences, was located at the level of the precentral gyrus in the left temporoparietal region. There were no findings for neurofibromatosis in the family history.
The prominent differences in radiological appearence led us to think that these tumours may not have identical histological pattern. Both lesions were excised totally following a broad frontotemporoparietal craniotomy in a single session. On the histopathological examination the lesion located on the sphenoid bone was found to be a myxomatous metaplastic meningioma (myxoid meningioma) grade 1 (WHO-93); the other lesion was found to be a psammamotous meningioma grade 1 (WHO-93).

Discussion

Meningiomas are very common intracranial tumours that rarely show intracranial multiplicity except in Recklinghausen disease. Multiple meningiomas were first described by Anfimov and Blumenau in 1889. Cushing and Eisenhard elucidated that multiple meningioma should be diagnosed after neurofibromatosis or reccurrences are excluded.

During the era before computed tomography was available, the incidence of multiple meningioma was reported to be 1.1%. Recently the reported incidence has increased up to 4.4-10.5% because of improvements in medical imaging and the widespread use of CT and MRI.

The pathogenesis of multiple meningiomas is not clear. The female predominance observed in multiple meningiomas led researchers to consider that hormonal stimuli may cause proliferation of meningiomatous tissue. However, this suggestion does not explain multiple meningiomas reported in males, as in the present case.

Zervas et al. reported that genetic susceptibility should be considered as a possible cause on the basis of congenital abnormalities of the mesodermal germ layer observed in the development of the meningiomas. Cases of multiple meningiomas reported in monozygotic twins also support this suggestion.

Multiple meningiomas are usually located unilaterally and they are thought to originate from a multicentric focus. The multiplicity of these tumours may be due to their spread via CSF or venous structures. However, this theory does not adequately explain the origin of multiple tumours of different histological type. In this situation assumptions about multifocal tumour development are more convenient.

Stangl et al. found two cases of multiple meningiomas with different histological types in their series of twelve multiple meningioma cases and concluded that in these cases the meningiomas developed independently. Moreover, the coincidental presentation of meningiomas together with other neuroepithelial tumours supports this hypothesis.

Recent developments in imaging techniques not only increased the number of cases of multiple meningiomas reported but also allowed suggestions to be made about the histological type of the lesions. Before CT and MRI were used widely this could only be detected incidentally after a reccurrence or autopsy.

In conclusion, multiple meningiomas may present without Recklinghausen disease and preoperative MR imaging may give information about the histological resemblence of the lesions, which may be helpful in planning the surgical procedure.

Final Diagnosis

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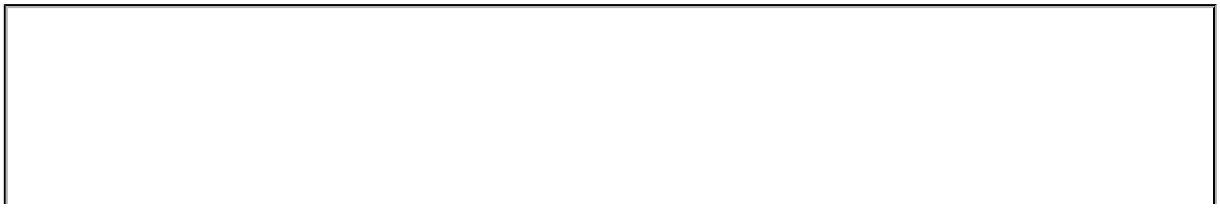
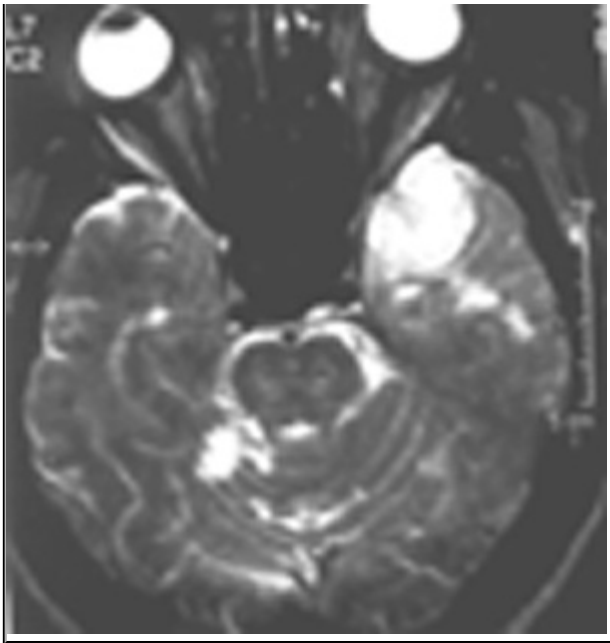
Figures

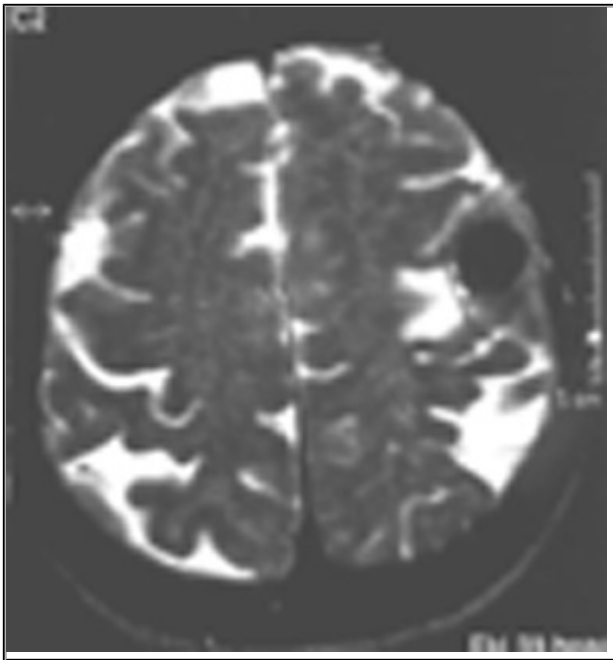
Figure 1 T2-weighted axial images





In the anteromedial part of the left middle cranial fossa an extraaxial hyperintense mass is seen.

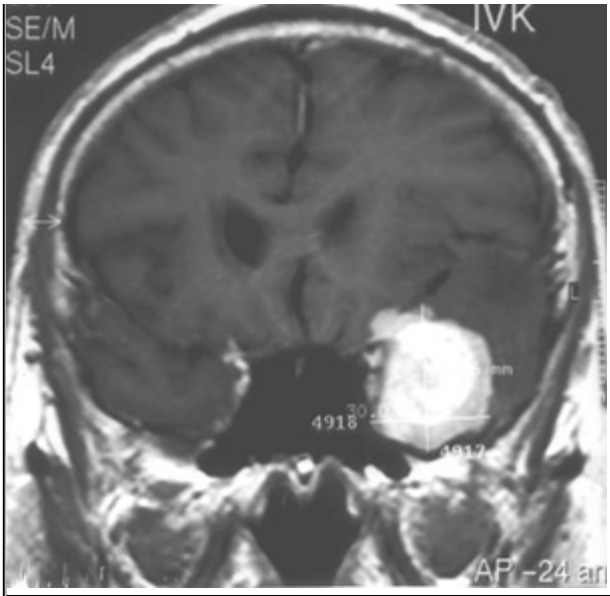
Area of Interest: unknown;
Imaging Technique: T2-weighted axial images;



In the left parietal region an extraaxial mass with marked hypointense signal intensity is seen.

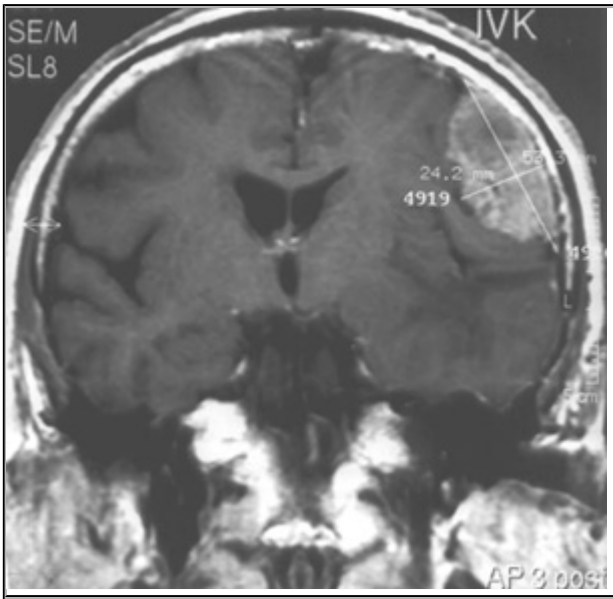
Area of Interest: unknown;
Imaging Technique: T2-weighted axial images;

Figure 2 Post-contrast T1-weighted images



The lesion located in the left temporal region shows marked contrast enhancement.

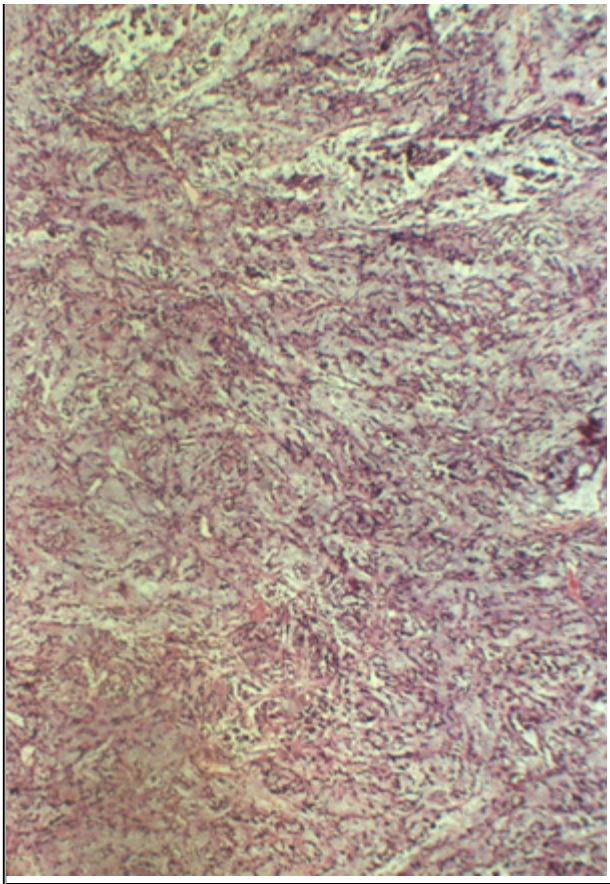
Area of Interest: unknown;
Imaging Technique: Post-contrast T1-weighted images;



The lesion located in the left parietal region shows moderate to low contrast when compared with the other lesion.

Area of Interest: unknown;
Imaging Technique: Post-contrast T1-weighted images;

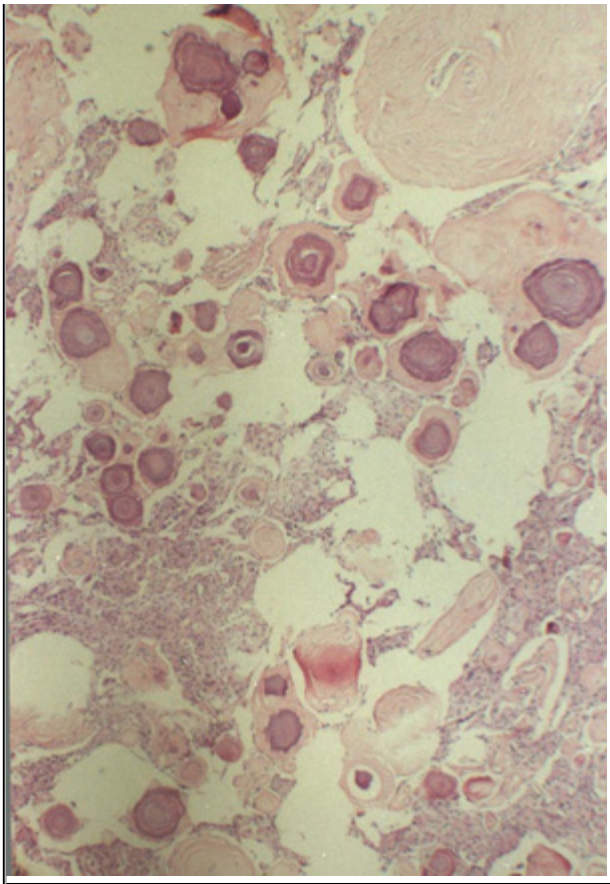
Figure 3 Histopathological examination



Myxomatous metaplastic meningioma having a stromal component with myxoid degeneration in broad areas (HE x 4).

Area of Interest: unknown;
Imaging Technique: Histopathological examination;

Figure 4 Histopathological examination



Psammomatous meningioma including multiple calcified psammom bodies with a meningothelial component in the background (HE x 4).

Area of Interest: unknown;
Imaging Technique: Histopathological examination;

References

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Citation

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