CASE REPORT

A LARGE SUPRASELLAR PSAMMOMATOUS MENINGIOMA WITH BEAK OF A KIWI BIRD ENHANCEMENT: A CASE REPORT OF A RARE VARIANT

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ABSTRACT

The suprasellar meningioma (SSM) is definded as a tumor, which originating from tuberculum sella, diaphragma sella, spnenum plenoidale or anterior clinoid processes, and, developing between the two optic nerves, displacing the chiasm backwards and upwards. SSM represents 5-10% of all intracranial meningiomas. The classic syndrome consists of a bitemporal visual field defects and a normal sella in an otherwise healthy middle-aged person. We report a case of SSM in a 43 years old female, suffering from headache and progressive visual deterioration for about three months.Magnetic resonance (MR) imaging revealed a homogeneously enhancing suprasellar lesion with a characteristic beak of a Kiwi bird enhancement along the sphenum plenoidale as a dural tail. She underwent surgical treatment via unilateral pterional approach, achieving complete tumoral resection. Histopathological evaluation revealed WHO grade 1 psammomatous meningioma which is a rare varient for intracranial meningiomas. There was no neurological deficit after surgery. The radiological imaging generally differentiates these tumors from other suprasellar tumors with a high degree of accuracy. The classical MR imaging finding is a homogeneously enhancing suprasellar mass with the characteristic anterior dural enhancement along the planum sphenoidale which resembles the beak of a Kiwi bird. Our case was confirmed histopathologically as a meningioma of psammomatous subtype which is the rarely seen varient in the intracranial region and the most common subtype in the spinal cord.

Key words: suprasellar meningioma, pterional craniotomy, psammomatous meningioma, beak of a Kiwi bird enhancement

Introduction

Meningiomas are common extraaxial tumors of central nervous system (CNS) accounting about 30% of all primary brain tumors.[1] They are derived from the meningothelial cells of arachnoid matter and are attached to the adjacent dura matter.[2] Suprasellar meningiomas (SSMs) represent 5-10% of all intracranial meningiomas.[3,4] The main presentation is visual deterioration manifested by progressive vision loss and visual field defect, especially bitemporally due to the optic chiasm compression. Management is the gross-total resection, however, it is challenging due to the complex anatomy of the region and the close relationship of the tumor with vital structures. Visual prognosis after surgery is variable and affected by various factors including the size of the tumor, age of the patient, preoperative visual functions, optic nerve encasement and duration of the symptoms.[5,6] Here, we report a large psammomatous SSM which is the least common among intracranial meningiomas reported in the literature.

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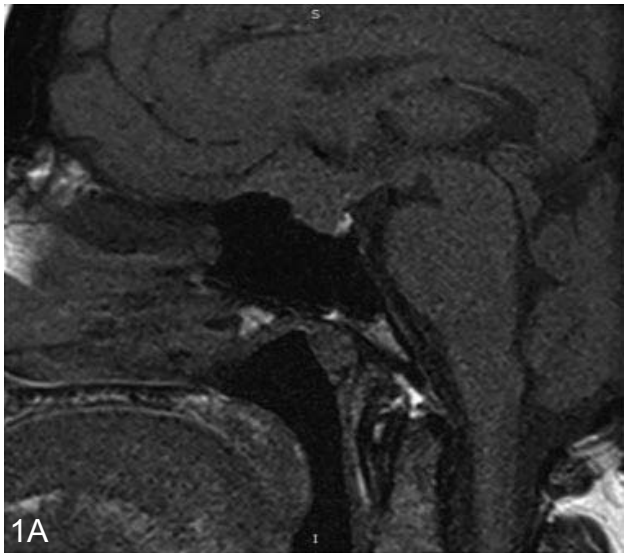
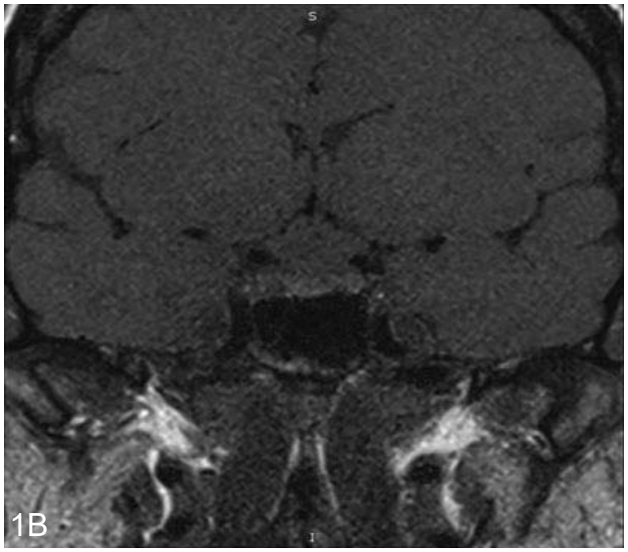
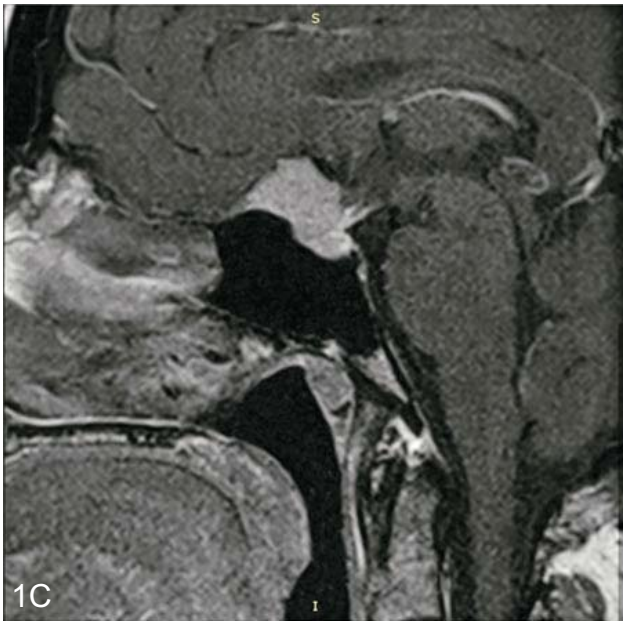
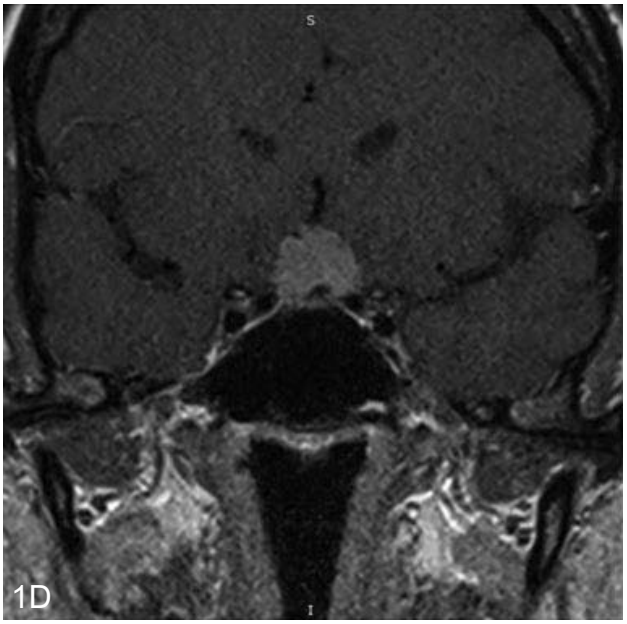
Case Report

A 43 year old female was admitted to our hospital with a three months history of visual deterioration and headache. Ophtalmological examinations revealed reduced visual acuity and bitemporal visual field defects suggestive for optic chiasm compression. She underwent magnetic resonace (MR) imaging of head, which revealed a 16x15x11 mm sized well defined lesion located along the frontal base, planum sphenoidale and tuberculum sellae withintrasellar extension. The tumor was in contact with pituitary stalk inferiorly. The optic chiasm was compressed and displaced superiorly (Fig. 1A-B).The lesion was isointense on T1 weighted MR images. Following contrast administration the tumor was homogenously enhanced with gadolinium. In addition, there was an obvious anterior extension to the planum sphenoidale as a dural tail which resembles the beak of Kiwi bird on sagittal view (Fig. 1C-D). There was no invasion to the cavernous sinus and vascular structures. MR angiography (MRA) did not show any narrowing of the anterior cerebral circulation (Fig. 1E). The endocrine tests to evaluate the hypothalamic pituitary axis were unremarkable.She underwent surgical treatment of the tumor via right pterional approach achieving comlete tumoral resection.The postoperative MR imaging (next day after surgery) revealed total excision









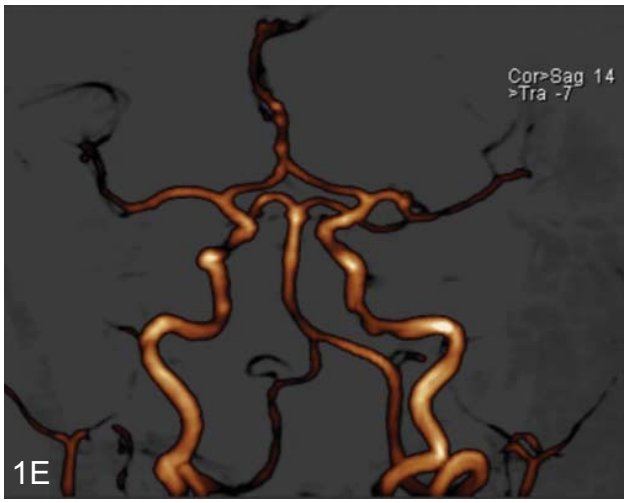
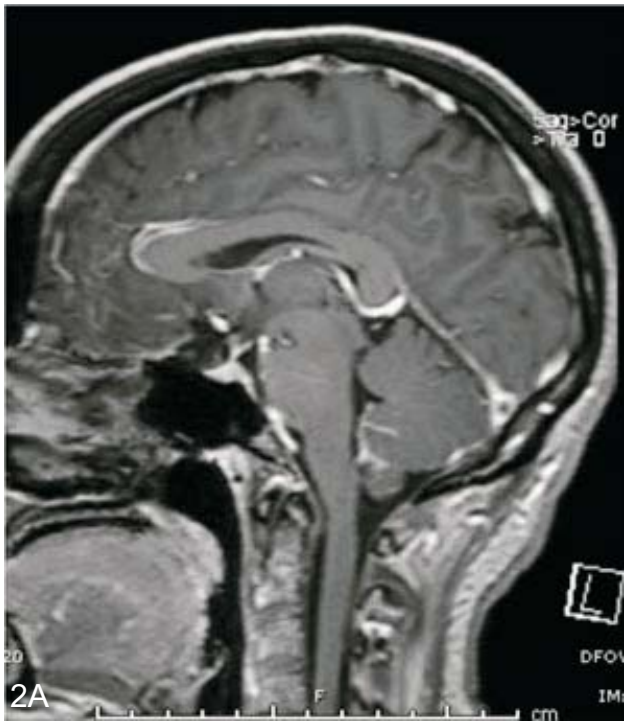
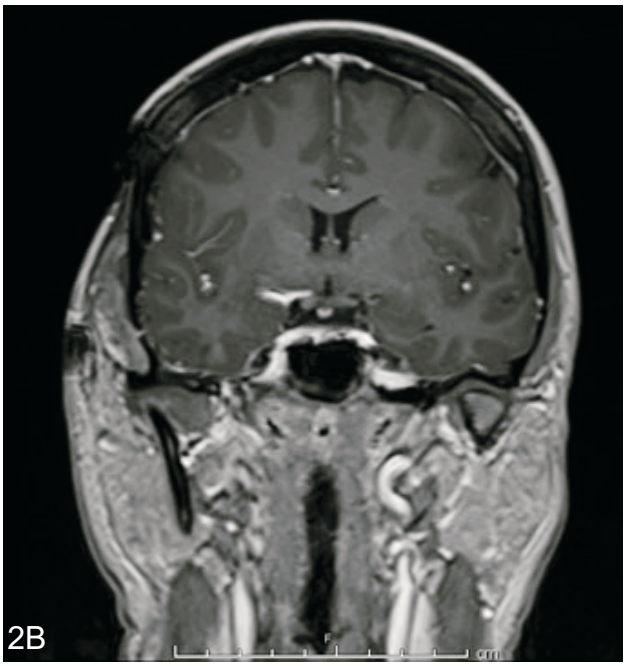


Figure 1: Preoperative MR imaging of the patient with suprasellar meningioma **A)** The sagittal T1 weigted MR image shows the isointense tumor located at the suprasellar region with intrasellar extension.The tumor was in contact with pituitary stalk inferiorly **B)** The coronal T1W MR image shows compression of the ortic chiasm by the tumor **C)** The contrast enhanced sagittal MR image shows homogenously enhancing well defined suprasellar mass with the dural tail sign **D)** The contrast enhanced coronal MR image shows the superior extension of the suprasellar lesion with displacement of the chiasm. The pituitary gland appears as normal. **E)** MR Angiography showing no narrowing of the anterior cerebral circulation

of the tumor (Fig. 2A-C). Histopathological evaluation revealed a moderately hypercellular meningioma with scattered concentric calcifications (psammoma





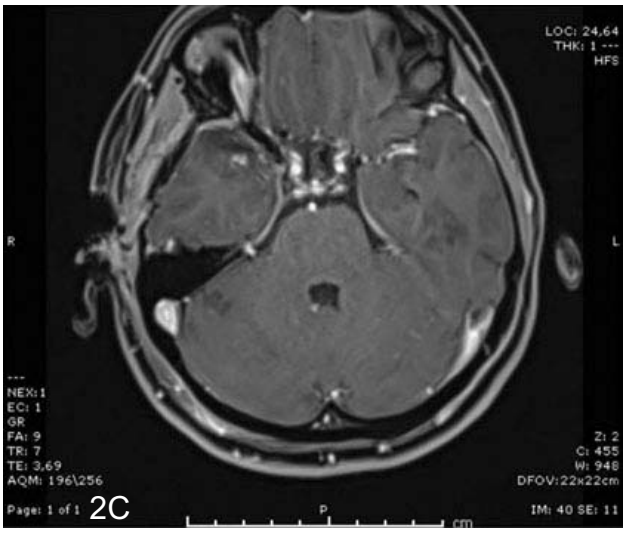
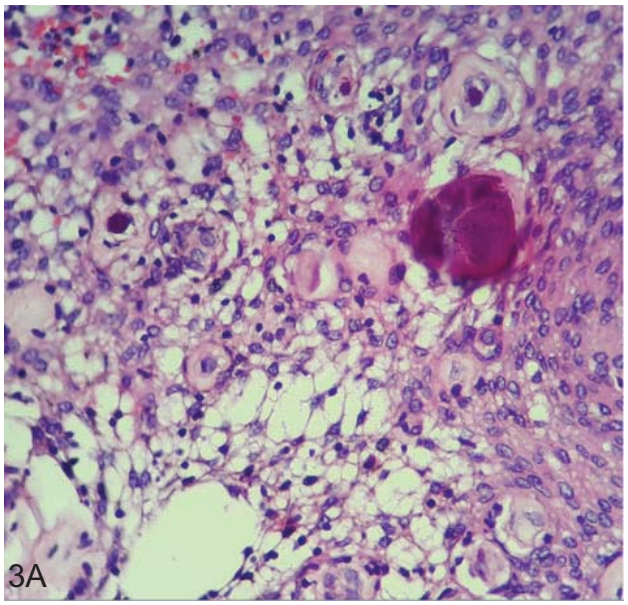


Figure 2: Postoperative MR imaging (the next day after surgery) of the patient with suprasellar meningioma **A)** The contrast enhanced sagittal MR image **B)** The contrast enhanced coronal MR image **C)** The contrast enhanced axial MR image show the total removal of the tumor. The pituitary gland appears as normal.

bodies). Tumour cells have regular nuclear features. There is no areas of necrosis and brain invasion (Fig. 3A-B). There was no neurological deficit after surgery and the patient recovered well.

Surgical Resection: In this operation, we preferred the right pterional approach to reach the tumor instead of subfrontal interhemispheric craniotomy (requiring bicoronal incision) in order to reduce the extent of



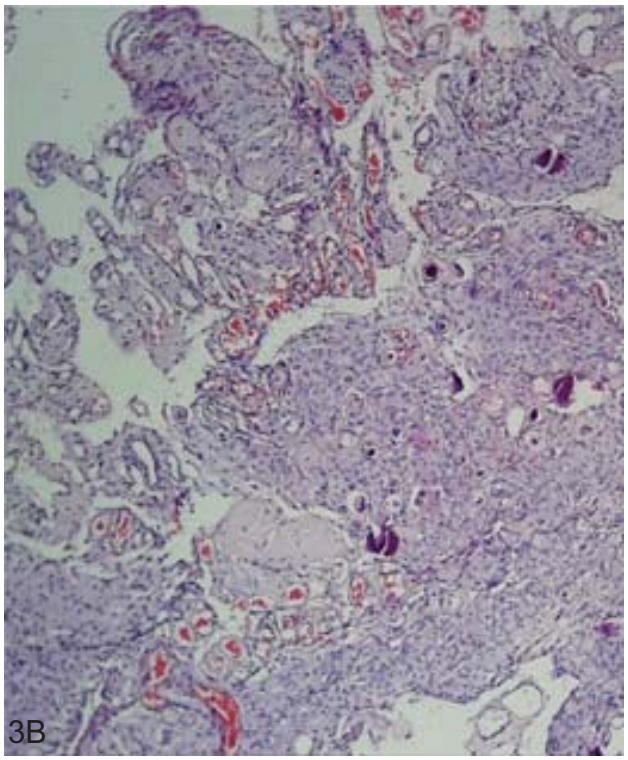


Figure 3: Microscopic appearance of the surgical specimen showing a moderately hypercellular meningioma with scattered concentric calcifications (psammoma bodies). Tumour cells have regular nuclear features.

the craniotomy and to have a better handling on the carotid system. After that, sylvian dissection was performed under a microscope and carotid and chiasmatic cisterns were reached. Bilateral internal carotid arteries (ICA), anterior cerebral arteries (ACA), and optic nerves were preserved well. The meningioma extending below the right frontal lobe was seen between the two optic nerves. Although the tumor was adjacent to both A1 and A2 segments of ACA, it was found that they were not surrounded by the tumor tissue, and the arachnoid bands in between were cut off with microscissors and the tumor was released by disconnecting from the anterior arterial system. Then, the parts of the tumor causing pressure on both optic nerves were excised and the nerves were released. Finally, the connection with the anterior clinoid processes in the pituitary fossa was burned with bipolar and excised. The neighbouring part to the stalk came freely when pulled by a microdissector and complete removal was achieved without complication.

Discussion

SSMs arise from the dura mater of tuberculum sella, diaphragma sella, spnenum plenoidale and anterior clinoid processes. They grow in the subchiasmal area and when they become large enough they comprese and displace the optic chiasm superiorly, and then optic nerves laterally resulting in the characteristic clinical presentation which is slowly progressing visual deterioration.[3] The radiological imaging generally differentiates these tumors from other suprasellar tumors with a high degree of accuracy. The classical MR imaging finding is a homogeneously enhancing suprasellar mass with the characteristic anterior dural enhancement along the planum sphenoidale which resembles the beak of a Kiwi bird. This finding helps in the differentiation of the lesion from pituitary masses when the pituitary gland is indistinguishable from the tumor. Since the surgical approaches are totally different, this differentiation is crucial. The surgical treatment of SSMs is challenging due to the complex anatomical structure of the suprasellar region and the close relationship of the tumor with vital structures including anterior visual pathways and anterior cerebral circulation arteries which may be encased by the tumor. Therefore the aim of management is total gross resection without injury to the nearby vital structures. There are several transcranial microsurgical approaches. We used unilateral pterional approach

in order to reduce the extent of the craniotomy and to have a better handling on the carotid system. We achieved complete tumoral excision without any neurological and ophtalmological morbidity. The patient recovered well. Histopathologically, the meningothelial meningioma is the most commonly encountered WHO grade 1 meningioma in the suprasellar region.[7,8] In the study of Fahlbusch and Schott[7] 79% cases of the 47 patients and in the study of Arkadiusz Wilk et al.[8] 77% of 18 patients with SSMs were meningothelial meningioma. Our case was psammomatous meningioma which is the rarely seen varient in the intracranial region and the most common subtype in the spinal cord.

Conclusion

SSMs are rarely seen intracranial meningiomas presenting with progressive vision loss and visual field defects. The radiological imaging generally differentiates these tumors from other suprasellar masses with a high degree of accuracy. The classical MR imaging finding is a homogeneously enhancing suprasellar mass with the characteristic anterior dural enhancement along the planum sphenoidale which resembles the beak of a Kiwi bird. Our case was confirmed histopathologically as a meningioma of psammomatous subtype which is the rarely seen varient in the intracranial region and the most common subtype in the spinal cord.

Conflict of Interest: None

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