Sylvian Cleft Meningioma: Surgical approach and postoperative morbidity

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ABSTRACT

***Background**: Meningiomas without dural attachments are rare, and are commonly diagnosed postoperatively. We here report a case of meningioma and examine the surgical options.*

***Method**: We reviewed the case record of the patient who presented with a right sylvian cleft meningioma as well as relevant literature on the subject.*

***Result**: Brain CT scan performed on a 73-year-old woman on admission for non-specific symptoms revealed a heterodense temporoparietal mass which was demonstrated on carotid angiography as being fed by the middle cerebral artery. Preoperatively, a glioma was considered as being most probable because of its radiological features. The mass, which at surgery was found to be located in the sylvian fissure, was however histologically confirmed to be a meningotheliomatous meningioma with fibroblastic component*

***Conclusion**: The surgical approach to meningioma of the sylvian cleft is a prime determinant of outcome following tumour resection. Making an appropriate approach largely depends on making a correct preoperative diagnosis for which a high index of suspicion is necessary.*

KEYWORDS: Sylvian fissure Meningioma; Postoperative morbidity; Surgical approach.

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INTRODUCTION

Generally believed to arise from the meninges, meningiomas account for 13 to 18% of all intracranial neoplasms[1]. They have a tendency to favour certain sites; and in practice, they are found to be attached to any one of the three meninges. Although the majority are attached to the dura, it is generally held that they arise from the arachnoid villi included in this structure[2]. Meningiomas without dural attachment[3] are rare. Deep sylvian meningioma, a term applied by Cushing and Eisenhardt[4] who also reported two cases, comes under this category. To date, less than 50 of such cases have been reported in the literature. In many of them, the diagnosis was made retrospectively; with gliomas featuring high among the preoperative differential diagnoses. In this paper, we report an additional case of this rare tumour seen at the Kochi Medical School Hospital, Japan, with the aim of highlighting the importance of having it as one of the differentials in cases of suspicious mass lesions with similar features. This is because the optimal approach to the tumour (which carries a smaller chance of postoperative morbidity) is determined by a correct preoperative diagnosis.

CASE REPORT

T.A. is a 73-year-old woman who was observed to be having difficulty recalling names of close relatives during a routine admission for investigation of chronic diarrhoeal disease at a peripheral hospital. Following brain CT scan done to rule out intracranial pathology, a mass was discovered in the right temporo-parietal region, and patient was referred to our service. Her past medical history was not contributory, and apart from slight disorientation to person and time, patient appeared neurologically intact.

Brain CT scan (Fig. 1A, 1B) showed a right hyperdense temporo-parietal mass which enhanced markedly on injection of contrast medium. It was calcified in part and showed evidence of trapped subarachnoid space. It had a clear demarcation and there was displacement of the basal ganglia and midline structures to the left without evidence of infiltration of the surrounding structures.

Carotid angiography revealed a distinct tumour blush in the right temporo-parietal region, with its main feeding vessel arising from the middle cerebral artery (Fig. 2A and 2B).

Plain skull x-ray was normal, and there was no evidence of chronic raised intracranial pressure. Other routine tests were within normal limits.

Based on these findings, a diagnosis of glioblastoma was made and the patient was scheduled for surgery.

The tumour was approached via a right temporo-parietal craniotomy, with corticotomy of the middle temporal gyrus. It was very vascular and had a relatively firm consistency. There was no apparent attachment to surrounding structures. Total excision was performed with the aid of Cavitron Ultrasonic Sunction Aspirator (CUSA).

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Pathological examination of the excised tissue returned a diagnosis of meningotheliomatous meningioma with fibroblastic component. There was no evidence of malignancy (Fig. 3A and 3B).

Subgaleal fluid collection, which appeared four days postoperatively, was conservatively managed, and patient could be discharged home three weeks after surgery without new neurological deficits. Her disorientation however persisted, and one month later, she was readmitted for insertion of a ventriculoperitoneal shunt because of progressive hydrocephalus.

Table I. Major symptoms in 24 reported cases of deep sylvian meningioma

Symptoms[a]	No. of cases	Percentage
Convulsive seizures	7	29.2
Fainting spells	3	12.5
Headache	12	50.0
Visual disturbance	4	16.7
Mental symptoms	1	4.2
Disorientation	1	4.2
Hemiparesis	1	4.2
Vomiting	2	8.3

[a]Some cases presented with more than one symptom

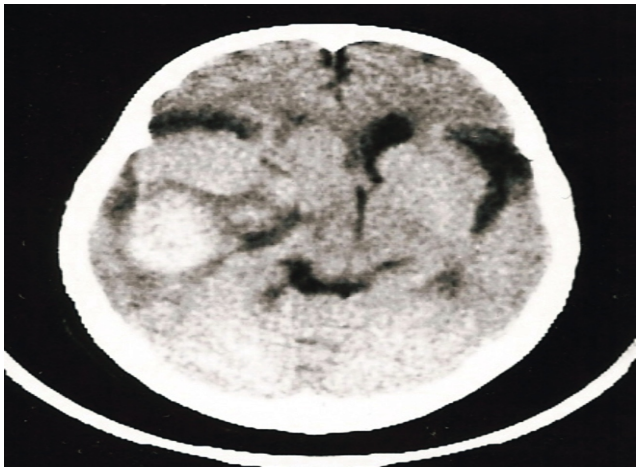

Fig. 1a

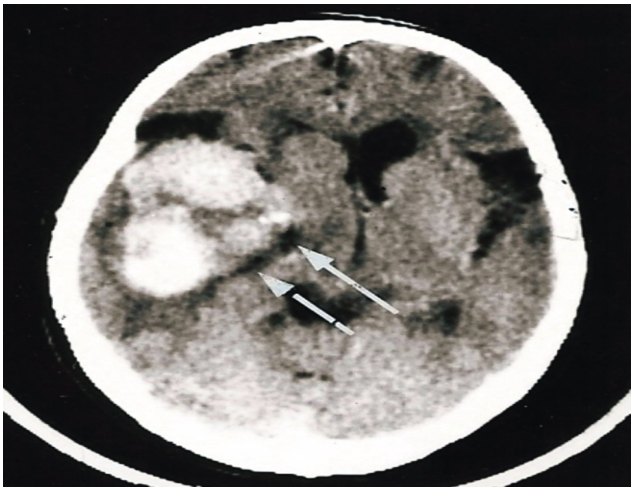

Fig. 1b

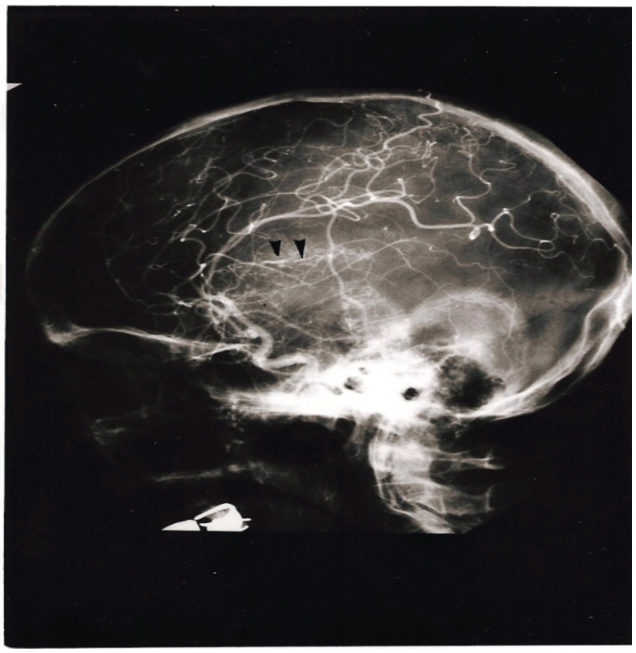

Fig. 2a

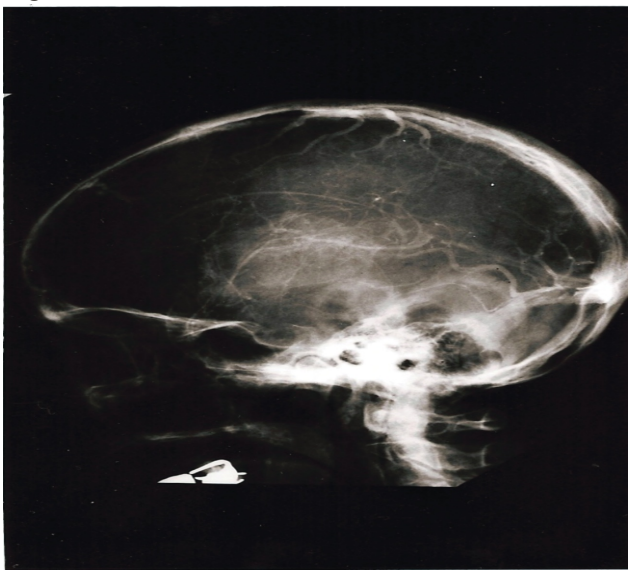

Fig. 2b

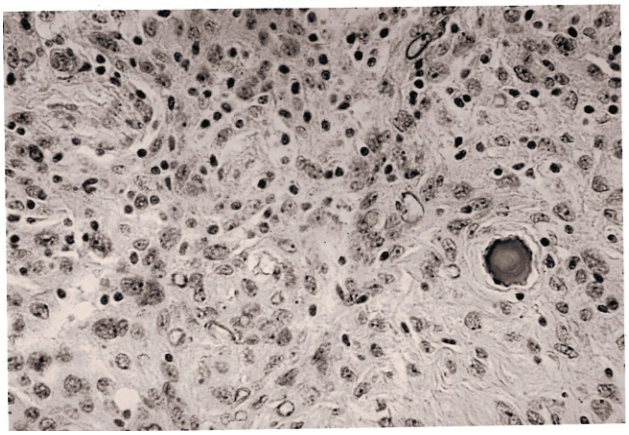

Fig. 3a

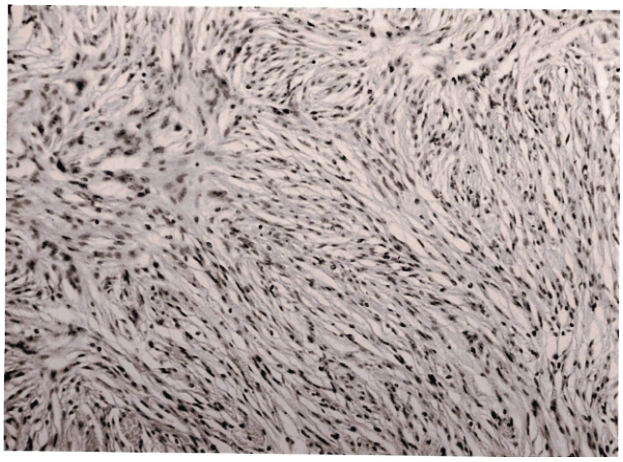

Fig. 3b

DISCUSSION

Meningiomas without dural attachment were grouped into four categories by Cushing and Eisenhardt[5] based on their location. They include: (1) Intraventricular meningiomas,(2) Subcortical meningiomas, which are thought to arise from the lateral margin of the superior tela,(3) Meningiomas of the sylvian cleft and (4) A subtentorial psammomatous type of inconclusive origin. Intraventricular meningiomas are indistinguishable from the surface tumours and may arise in the tela choroidea, or in the stroma of a choroid plexus[1].

Like other meningiomas without dural attachment, deep sylvian meningiomas are considered to arise from leptomeningeal extensions within the sylvian fissure[6]. Although they present with a wide range of clinical symptoms, headaches and seizures were the most frequently encountered among the 24 cases we reviewed occurring in about 50% and 29% respectively (Table I). It is noteworthy that in many of the reported cases, actual diagnosis of the tumour was established only after histological examination of the excised tissue. This may partly be due to its rarity on the one hand, and the necessity to rule out more common intra-axial tumours such as gliomas and malignant lymphomas[6], on the other. Consequently, insufficient attention is given to the possibility of its existence during the preoperative workup. Okamoto et al consider that some of the operative morbidities following tumour resection are partly related to the inappropriate approach to it due to uncertain preoperative diagnosis[7]. Relatively small tumours are easier to manage, and we agree with Tsuchida *et al*[8] that when tumour size is reasonable and diagnosis certain, a trans-sylvian route would afford a more appropriate approach.

The importance of angiography in making a correct diagnosis cannot be overemphasised a point that has been stressed by other authors[9]. A typical angiographic finding is "splitting" of the branches of the middle cerebral artery thereby outlining the mass[10]. Other suggestive findings include upward displacement of the middle cerebral artery with flattening of the insular curvature, and abundant vascular supply to the tumour from insular arteries. However, these findings are by no means specific; and Okamoto et al have demonstrated the value of stereoscopic angiography in helping to establish the diagnosis[7]. Also relevant is the fact that there is no apparent connection between tumour and the external carotid circulation as evidenced by the absence of middle meningeal artery dilatation as well as failure of tumour to opacify on selective catheterisation of the external carotid artery.

The CT features of meningioma of the sylvian cleft are those of an extra-axial mass. The tumour is usually seen as an iso- or slightly hyper-dense mass with considerable perifocal oedema. It is situated lateral to the insular cortex; and very importantly, the grey matter of the displaced claustrum and basal ganglia can usually be clearly identified without evidence of tumour infiltration. Part of the subarachnoid space may occasionally be seen insinuated between tumour and normal brain tissue.

CONCLUSION

A good index of suspicion is essential in order to make a diagnosis of deep syvian meningioma preoperatively. CT findings of an extra-axial mass in the region of the syvian fissure, including presence of trapped subarachnoid space between lesion and normal brain, in addition to the finding of typical angiographic features should alert one to the diagnosis. Since the trans-sylvian route averts the need to incise the temporal cortex, and reduces the chances of damaging vital blood vessels with the attendant morbidity thereof, it would probably be better to use this approach if the diagnosis is established preoperatively.

LEGENDS

Fig. 1. Preoperative CT scan
Plain CT (A). A lobulated mass with moderate perifocal oedema and low density areas within its substance can be seen in the right temporo-parietal area.
Enhanced CT (B). Tumour is well enhanced on administration of contrast medium. Note very low density suspected to be trapped subarachnoid space between tumour and normal brain tissue (arrows).

Fig. 2. A and B. Right carotid angiogram
The right middle cerebral artery is stretched and displaced superomedially with elevation of the sylvian point. Note tumour stain in the temporo-parietal region with its feeder (arrow heads) arising from the middle cerebral artery.

Fig. 3. Photomicrographs of separate areas of tumour showing meningotheliomatous (A), and fibroblastic (B) features.

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