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CASE STUDY

SYNCHRONOUS CEREBRAL MENINGIOMA AND ARTERIOVENOUS MALFORMATION

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ABSTRACT

A brain tumor associated with an arteriovenous malformation (AVM) is very rare. A 36 yr old female presented with two separate lesions, one in right front parietal (FP) and other in left FP area on MRI. The right side lesion was a tumor and the left side was an AVM. The right side lesion was removed first and was a meningioma, the left side lesion was an AVM and was observed. As it was Spetzler Martin grade - 4 without bleeding. We discuss the operative strategy in case of synchronous disease and review of literature.

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INTRODUCTION

The association of a brain tumor and an arteriovenous malformation (AVM) is rare. While there have been a number of reports, few of these have reported the details of the operative strategy, particularly the approaches used based on the preoperative information of both lesions. We describe our chosen strategy in case of two such synchronous lesions with review of literature.

Case report

A 36 yr old lady presented with complaints of headache and vomiting. Her level of consciousness was normal and she had no neurological deficits. MRI revealed a 6-7 cm. Lesion, isointense on T1W and hypo intense on T2W on right frontoparietal region, showing uniform homogenous contrast enhancement with mass effect on ipsilateral lateral ventricle, suggestive of a meningioma. There was another lesion on the left frontoparietal area near sensorimotor strip with flow voids and drainage into deep veins, suggestive of AVM (Spetzler Martin grade 4). The patient's headache was likely caused by the right side large meningioma. So we planned to resect it and later to do cerebral angiogram and decide about the AVM. The meningioma was very vascular but totally resected carefully. And the AVM was successively managed conservatively as it was high grade and never bled.

DISCUSSION

There have been 74 reported cases of brain tumor associated with AVM to the best of our knowledge (Hirohito Yano *et al.*, 2013). The rate of this rare association was reported to be 0.1% (Licata *et al.*, 1986). There is a male predominance (Male:47, Female:27). The ages ranged from 0 to 70 yrs, the median age was 28.5. The age of onset was unlikely to be related to the association of brain tumor and AVM and seemed more likely to depend on the kind of brain tumor involved. There are several hypotheses about the etiology and timing of the development of the two lesions in terms of which occurs first and whether one lesion causes the other. Environmental factors and viruses have also been speculated as triggers (Hirohito Yano *et al.*, 2013). Concerning the histology of brain tumors involved in these cases, there were 12 cases of pilocytic astrocytoma (Lombardi *et al.*, 1991; Soltanolkotabi *et al.*, 2012), 10 of astrocytoma (Kroh *et al.*, 1994; Suzuki *et al.*, 2002; Borges *et al.*, 2003), 6 of malignant astrocytoma (Borges *et al.*, 2003; Goodkin *et al.*, 1990; Nazek *et al.*, 1988), 20 of oligodendroglioma (Nazek *et al.*, 1988; Lombardi *et al.*, 1991; Malcolm *et al.*, 1991), 3 of glioblastoma (Borges *et al.*, 2003; Warren, 1969) of meningioma (Hirohito Yano *et al.*, 2013), 5 of acoustic tumors and 3 of pleomorphic xantho astrocytoma (Hirohito Yano *et al.*, 2013).

Other tumors include haemangioblastoma, haemangiopericytoma, ganglioneuroma, craniopharyngioma. In the remaining two cases, histology was simply described as glioma (Hirohito Yano *et al.*, 2013).

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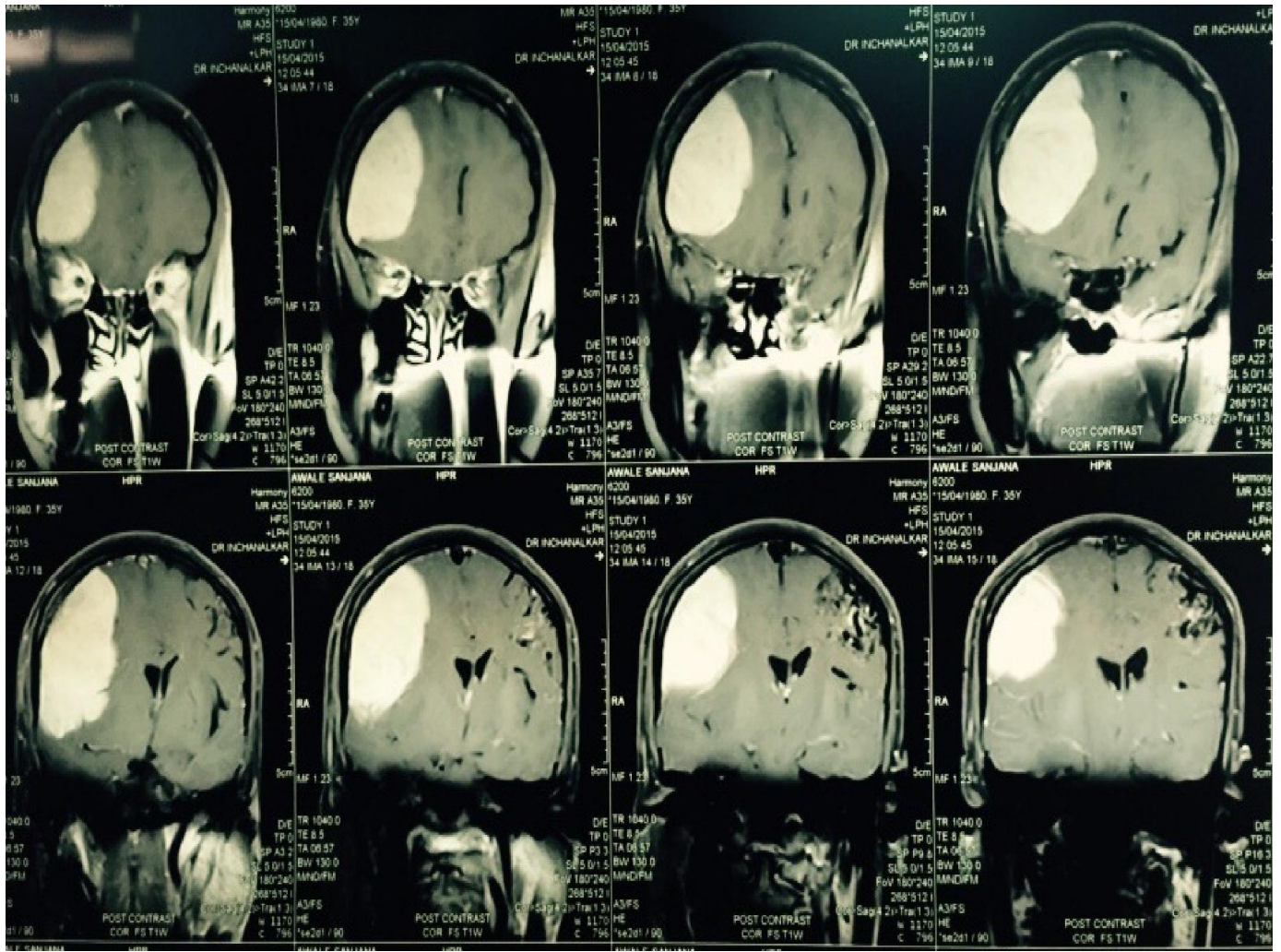


Fig. 1. Preoperative MRI showing the tumour



Fig. 2. Specimen showing the meningioma

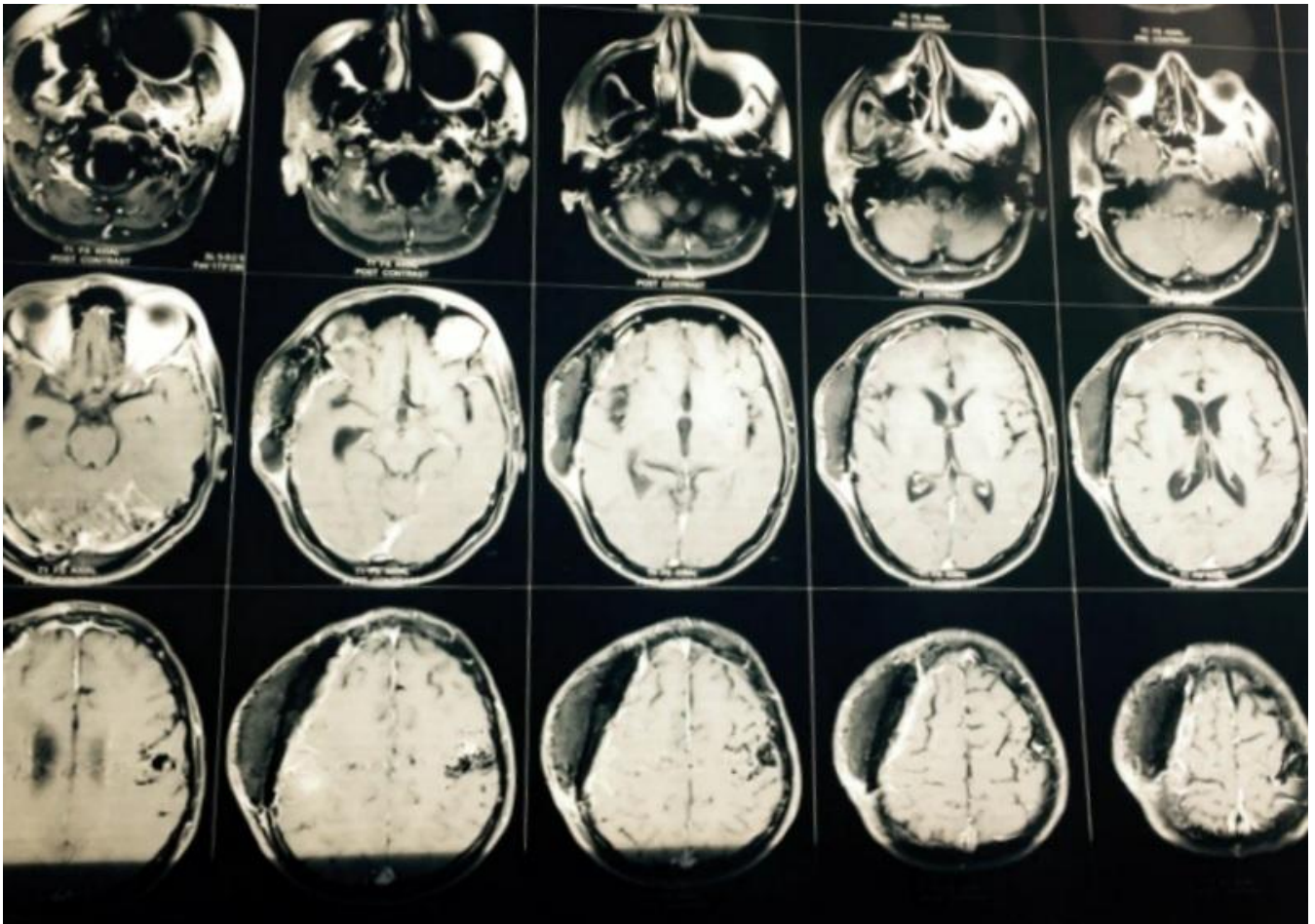


Fig. 3. Postoperative scan with craniotomy defect and total excision of the tumour



Fig. 4. Preoperative cerebral angiography showing the arteriovenous malformation

In the present case the histology was a meningioma. We diagnosed both the lesions preoperatively and decided to remove the tumor first as it was big causing mass effect and most likely the cause of her headache. The tumor was gradually microscopically dissected all around from the brain. There were lot of vessels around the periphery and lot of bleeding encountered. It was also involving the dura which was also excised in to. The dura was replaced with artificial dura. Once the patient recovered from this surgery, we obtained a new MRI and did a cerebral angiogram for the AVM. It was a nidus of 3 cm, in eloquent area draining in deeper veins (Spetzler Martin grade 4). It didnt bled anytime. Considering all this we decided to observe it. And treat it subsequently if it becomes symptomatic.

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