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CASE STUDY

STAGED NEUROSURGICAL APPROACH TO COMPLEX SKULL BASE LESION

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ABSTRACT

Skull base tumors are a challenge to neurosurgeons. Starting from meningiomas, pituitary tumors to clival chordoma or acoustic schwannoma all demand a complex case planning and strategy (Koutourousiou *et al*., 2013). We present a skull base meningioma in a adult male treated in two stage surgery with complete tumor excision with no gross neurological deficit. Single stage exhausting prolonged surgery weighs inferior to staged surgery with good outcome with minimal complications.

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INTRODUCTION

Skull base tumors involve all three anterior, middle and posterior cranial fossa. Meningiomas are the most common lesion can be olfactory groove, planum sphenoidal, clinoidal or petroclival. Pituitary tumors and craniopharyngiomas are a well known entity. (Malekpour and Cohen-Gadol, 2014) Chordoma, chondroma, chondrosarcomas and glomus jugulare are the other entities. Treatment is a challenge specially in invasive lesions more so in middle and posterior cranial fossa. Our case was an adult male with middle and posterior cranial fossa involvement and was treated in a staged manner with minimal deficit.

MATERIALS AND METHODS

Our patient a 40 yr old adult male got admitted in our hospital with history of headache and episodic facial spasms for last 2 months. On examination no gross neuro deficit was seen. Patient underwent MRI brain which revealed contrast enhancing lesion in the petroclival region with compression of brainstem and surrounding structures as in Fig 1. Detailed discussion was done with patient regarding nature of disease, approach to surgical excision and likely risks and benefits. Single staged exhaustive presigmoid and retrosigmoid surgery to staged 1st stage presigmoid approach followed by 2 nd stage retrosigmoid approach was discussed. Patient gave consent for 2 nd option and we undertook the surgery. Patient underwent presigmoid subtemporal approach for the middle cranial fossa part of the tumour. Tumour was highly vascular, firm and piece meal excision could be obtained using CUSA. All neural elements were safeguarded. After a 6 hrs procedure patient was extubated without any deficit and shifted to iCU. Post op CT was satisfactory and patient was discharged after 4 th day to follow up after 2 months for the 2nd stage procedure. After 2months patient underwent a MRI as in Fig 2 which showed the remaining clival part of tumour. Patient underwent now retrosigmoid approach extending the earlier incision inferiorly in retromastoid region in a park bench position. Neurophysiological monitoring by SSEP and facial nerve and other lower cranial nerve monitoring was instituted. After a routine retromastoid craniotomy and retracting the cerebellum via subarachnoid approach to the lesion and piece meal excision of the tumor done microscopically from the cerebellopontine region and in front of brain stem using the CUSA.

RESULTS

After a 6 hrs surgical procedure complete excision of the tumour was done. Patient was extubated and mild facial nerve paresis was noticed which improved in following days. No other gross deficit was seen. Neurophysiological monitoring did not reveal any damage to neural structures. After 1 day stay in ICU patient was shifted to ward and after 4 days stay in hospital was discharged home. Post operative CT scan is as per Fig 3.

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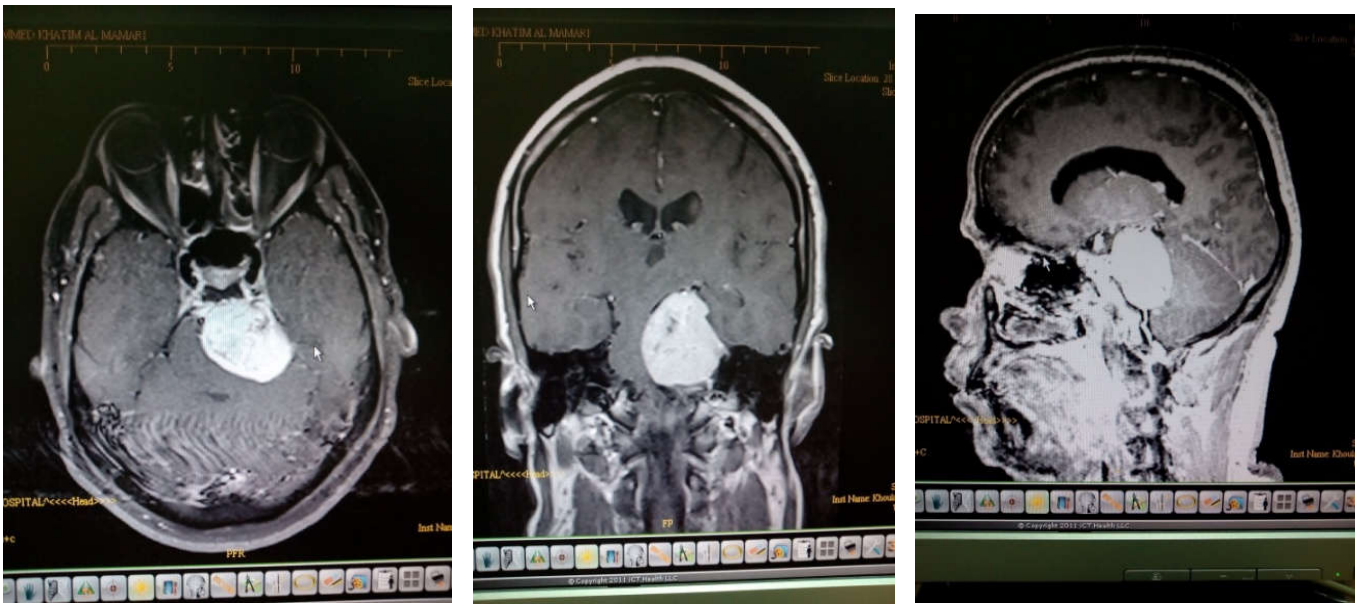

Fig.1. Pre operative MRI

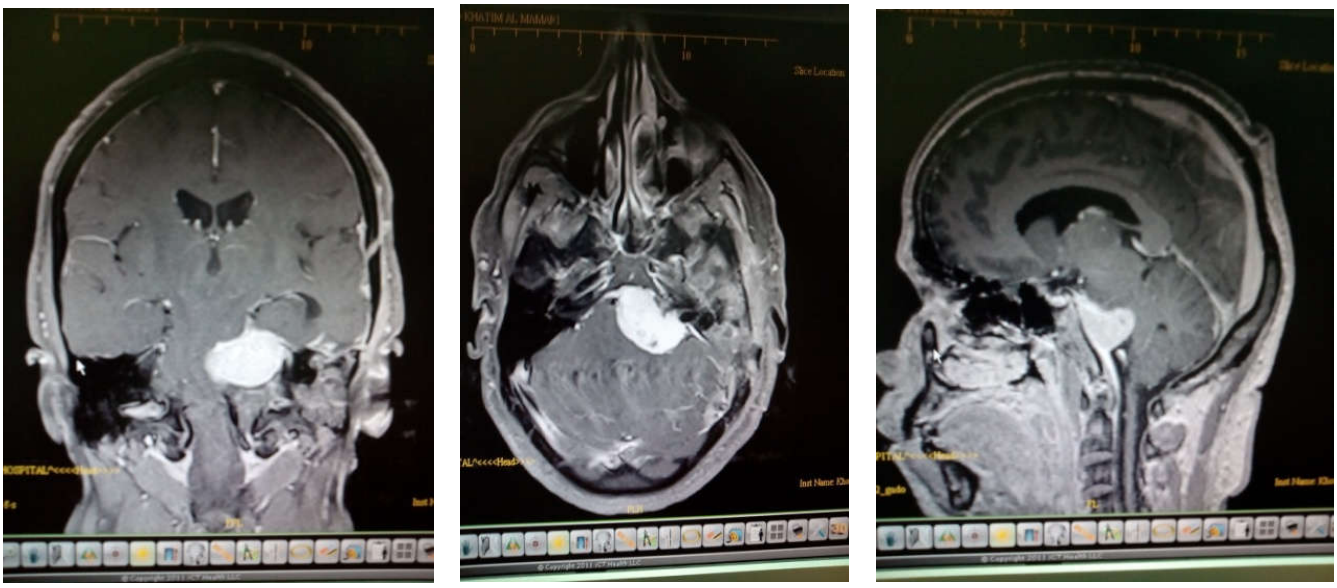

Fig.2. MRI after 1 st stage resection of supratentorial part

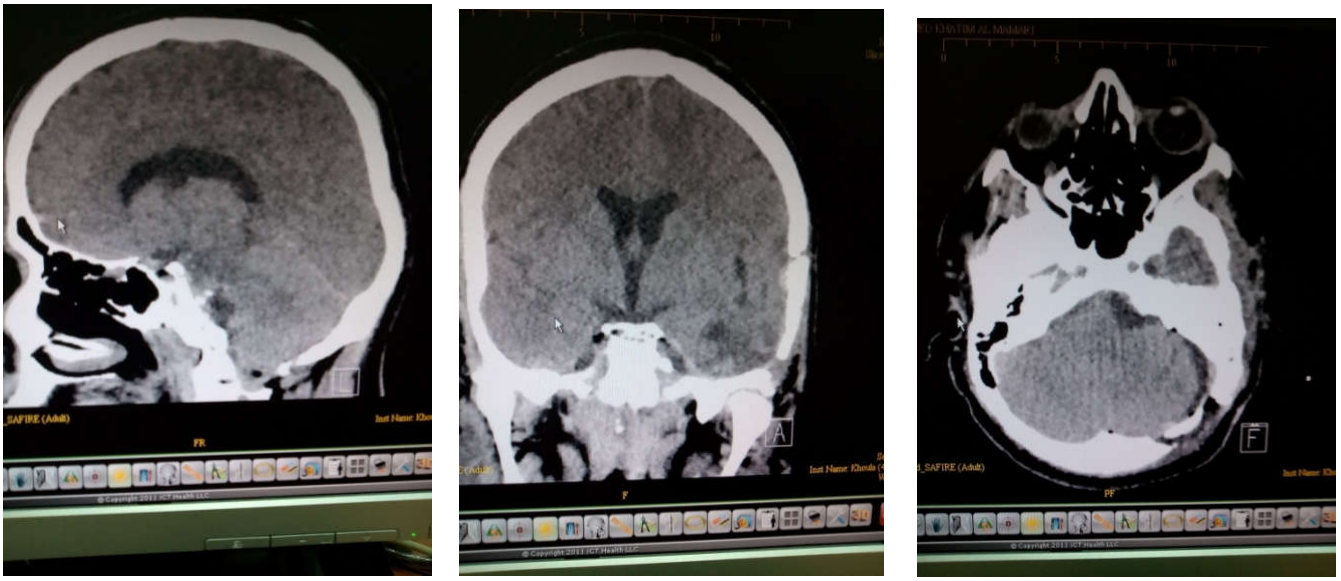

Fig.3. CT brain after 2 nd stage surgery

Histopathology revealed it to be WHO grade I meningioma and patient is on follow up in OPD.

DISCUSSION

Malekpour *et al* described in 2014 the Harvey Cushing's approach to complex skull base tumors in staged way for a better outcome (Malekpour and Cohen-Gadol, 2014). Yang K in 2017 described how to plan the surgery of petroclival meningiomas by preoperative simulation of abducens nerve course (Yang *et al*., 2017). Tajudeen BA in 2016 described ectopic pituitary adenomas presenting as erosive clival regions making hormonal assessment as prerequisite in preoperative planning which was done in our case (Tajudeen *et al*., 2017). Koutourousiou *et al*. described the endonasal endoscopic approach to complex skull base tumors specially massive invasive pituitary adenomas as a part of staged strategy (Koutourousiou *et al*., 2013). Masmitsu ABE in 1998 stressed the extensive preoperative planning on plastic skull models prior to venturing into complex skull base tumour surgeries (Masamitsu *et al*., 1998). Michell L in 2010 emphasized the importance of petroclival surgery and cranial nerve morbidities as a biggest challenge to manage (Era Michael L. DiLuna *et al*., 2010).

Conclusion

Staged surgical approach to complex skull base lesion versus single stage exhaustive prolonged surgery is more patient and surgeon friendly giving minimal neurodeficits better surgical outcome than to leave patient crippled with multiple neurodeficits. Our case report supports the idea of a staged approach to such lesions.

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