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REVIEW ARTICLE

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Surgery of Sphenoid Wing Meningioma with Vascular Encasement in Hadhramout University Al-Borj Hospital

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ABSTRACT

Background: Sphenoid Wing Meningioma surgery is one of the challenging surgeries in the field of neurosurgery. This is due to either a vasculature encasement or the tumor invasion to optic canal or cavernous sinus.

Objective: This study is developed mainly to assess the possibility of performing total excision of the tumor in order to decrease its compression on the neural structures and decrease brain edema.

Method: During period from March 2014 - March 2022; 50 patients of Sphenoid Wing Meningioma underwent to surgery.

Results: Headache was the most common presenting complain (60%), followed by convulsions (20%). The least common presenting complains were motor deficit (10%), visual change (4%), and heaviness of speech (6%). The tumor was totally resected in the most cases (90%) and only (10%) remanent of the tumor was left in the cavernous sinus and the main vascular structure (ICA). However, these results depend on surgical strategy of our teachers who are learning it.

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Introduction

Sphenoid wing meningioma represent 17- 25 % of all intracranial meningioma , this is the third most common site of origin for meningioma , after convexity and parasagittal areas. Sphenoid wing meningioma need to be removed as completely as is possible [1,2].

Meningioma should and can be removed completely unless in rare instances which it is attached to important blood vessels or neural structure of brain so neurosurgeon leaves very thin fragment of tumor on these important structures to keep patient in good quality of life.

The aim of this study is excision of tumor to remove brain compression without damage to important vascular or neural structure and decrease brain edema, this surgery is challenging either to vascular encasement or the tumor invasion.

Patient and Methods

In this prospective study 50 patient underwent to surgery Marsh 2014 – Marsh 2022 All cases had sphenoid wing meningioma.

Each patient was evaluated clinical and radiological prior to decision for surgery and follow up post operatively at multiple time points 3,6,12 month.

Table 1, 2 clarify the clinical and radiological finding for patients

Table 1

Clinical	Number of cases	Percentage
Headache	30	60 %
Convulsion	10	20%
Motor deficit	5	10%
Heaviness of speech	3	6%
Visual change	2	4%
Cognitive change	0	0%

Table 2: Radiological Assessment

Sphenoid ridge Origin	Number of cases	Percentage
Medial	20	40 %
Middle	10	20 %
Lateral	20	40 %

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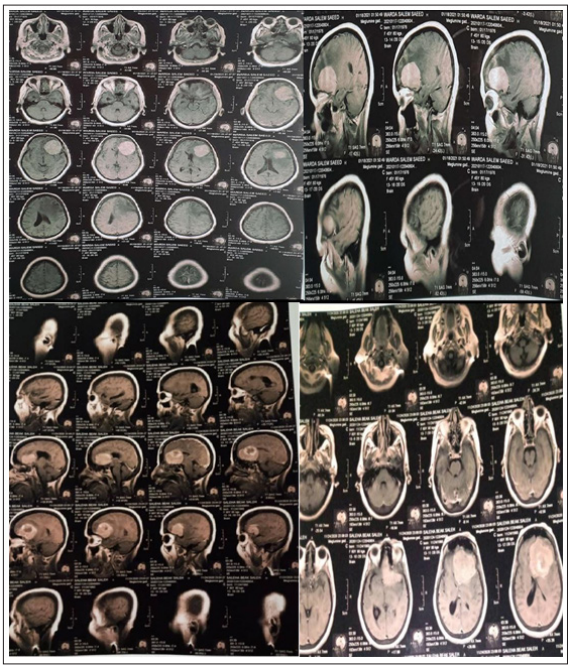

Figure 1: Preoperative Brain M.R.I

Pre-operative radiological evaluation was focus on identifying tumor association with brain edema extension of tumor into optic canal or cavernous sinus and encasement to vascular structures.

Surgical Technique

In this study all patient underwent for surgery under general anesthesia, we use pterional approach for all patients then remove the bone flap following by drilling of sphenoid ridge after drilling we preceded to extradural de vascularization of tumor then open the dura basely Identify the tumor dissection of brain tissue on surface of it de vascularization of tumor surface began medial to lateral and anterior to posterior to avoid injury to vasculature structures then internal de bulking and detachment of tumor from its dural insertion along sphenoid ridge.

If the fibrous tumor was attached to neurovascular structure our surgical experience was to leave small fragment of tumor to avoid injury for vascular structures total resection of tumor in the most cases (90%) only (10%) of the cases leave remnant of tumor on the cavernous sinus and the main vascular structure (I.C.A).

The result depended on surgical strategy of our teacher who learning it

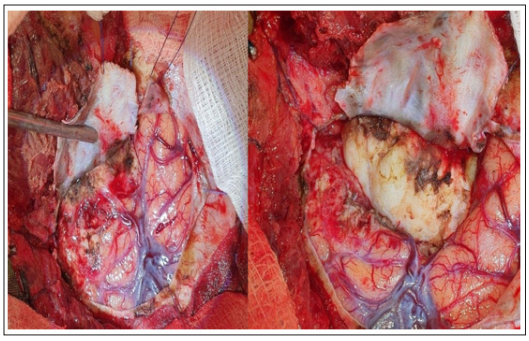

Figure 2

Results

Between Marsh 2014–Marsh 2022. 50 patients diagnosed with sphenoid wing meningioma underwent to surgery in Hadramout university - Al- Borj Hospital female was 30 patient represent (60%) while male 20 patient represent (40%) the most age group affected was 50 -59 years represent (50%) as describe in Table 3,4,5

Table 3

Gender	Number of cases	Percentage
Female	30	60 %
male	20	40 %

Table 4

Age	Number of cases	Percentage
40 -49	10	20 %
50- 59	25	50 %
60- 70	15	30 %

Table 5

Side	Number of cases	Percentage
Right	27	54 %
Left	23	46 %

from Table 1 we show the most complaint of patient as headache represent 60% .

follow by convulsion (20%) motor deficit (10%) visual change and heaviness of speech were less common complaint (6%, 4%).

Table 6

Major artery	40 case	80 %
Cavernous sinus	5 cases	10 %
Optic canal	5 cases	10 %

Table 7

Headache	
Visual change	Improved
Speech change	

Table 8

Complication	Number of cases
Aphasia	1
Right side weakness	2

Pre-operative radiological evaluation and post-operative clinically follow up as describing Table 6,7,8 we recorded the most cases had vascular encasement represent (80%) post operatively clinically follow up there is improvement in patients' complaints (headache, visual change, speech change).

But we have two complicated case first one aphasic and right-side weakness second case had right lower limb weakness this case improved within 6 weeks but first case starts to say wards within 2-3 months but right lower limb was improved to grade 5 within 4 weeks she is still complaint of upper limb weakness till now proximal grade 4 and distal grade 2.

Discussion

Sphenoid wing meningioma surgery is challenging in neurosurgical field either to vascular encasement or due to the tumor invasion to optic canal or cavernous sinus.

In our study we note the main complaint of patients is headache represent (60%) compared to the finding of other studies that note cognitive decline was the first symptom in other studies the visual deficit was the most symptom [3-5].

In pre-operative radiological assessment anterior circulation arterial encasement was the main point of view in our study this agree with previous studies have arterial encasement to be present in all most of cases of sphenoid wing meningioma [6].

The surgical treatment of sphenoid wing meningioma was performed in 1938 by Cushing and Eisenhardt there is different approaches have been described for exposing sphenoid wing meningioma [7-10].

In our study we using pterional approach which is allows for adequate and safe surgery but in other literature different alterature approaches we did not using due to time consuming and excessively invasive [11,12].

Tumor extension to optic canal and cavernous sinus can be approached using clinoidectomy and different triangles as described in literature our surgical strategy was left thin segment of tumor capsule on the important vascular structures and we did not using clinoid – ectomy during Surgery for all cases [13-19].

Sphenoid wing meningioma surgery is very difficult and is association with many risks and complication [19].

We reported two case complication post-surgery one case aphasic and right side weakness other case had right lower limb weakness this case completely improved within 6 weeks but first case start to say words within 2-3 month but right lower limb weakness improved within 4 weeks right upper limb weakness still till now since 2 years ago. slightly Improved to grade 2 this is not correlated with study of Adrian Bulasa et al, 9 December 2020.

That consider visual deterioration is the most frequent complication but correlated with champagne et al, reported an aphasia and hemiparesis are the immediate post-operative complication in his study [6].

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