

Outcome of Surgery in Sellar and Suprasellar Tumors Using Subfrontal Approach

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ABSTRACT

Aim: To study the outcome of surgery by subfrontal approach using Karanofsky's performance scale.

Methods: This descriptive and observational study was carried out at Department of Neurosurgery, Lahore General Hospital Lahore from 15th March 2013 to 15th September 2013. Thirty patients of sellar and suprasellar lesions were included. The head was positioned in slight extension. Bi-coronal skin incision and scalp flap was made by sharp dissection, preserving the supraorbital nerves bilaterally. Craniotomy was performed with the lower margin as low as possible at the supraorbital margin. The dura was opened horizontally along the lower margin of the frontal lobe to minimize damage to the bridging veins. The self-retaining brain retractors were used to retract the frontal lobe to approach the sellar region. Under the microscope, the tumor was dissected from the surrounding structures. The pituitary stalk was preserved as well.

Results: There were 17 (56.7%) males and 13 (43.3%) females with mean age of 27.93±17.79 years. As far as tumor is concerned, pituitary adenoma was found in 14 (46.7%) patients, craniopharyngioma in 11 (36.7%) patients, arachnoid cyst in 2 (6.7%) patients, benign giant cell tumor of the sphenoid bone in 1 (3.3%) patient, olfactory groove meningioma in 1 (3.3%) patient and keratin flakes in 1 (3.3%) patient. Karnofsky performance scale was 30 in 9 (30%) patients, 60 in 1 (3.3%), 70 in 2 (6.7%), 80 in 11 (36.7%) patients and 90 in 7 (23.3%) patients.

Conclusion: We conclude that this surgical approach is very useful and accurate for removal of large tumors in the sellar and suprasellar region. The large tumor can be removed via this approach without significant morbidity.

Key words: Sellar, suprasellar, tumors, subfrontal approach

INTRODUCTION

Sellatursicais the piece of sphenoid bone, in which pituitary organ rests. It involves two sections; adenohypophysis or foremost pituitary and neurohypophysis or back pituitary organ. Both have diverse embryological, morphological and utilitarian attributes. Pituitary tumors are the most well-known tumors in the sellar district.

Sellar and suprasellar district is firmly identified with the essential structures which incorporate carotid supply routes, optic chiasma and hypothalamus. These structures can confine the aggregate extraction of the tumor. Tumor resection relies upon: (I) size of the tumor (ii) consistency (iii) intrusion of the cerebrum parenchyma.¹ Proper endocrinological appraisal and sufficient administration in the preoperative period and watchful medical procedure under the magnifying instrument decrease the dreariness and mortality.²

Postoperative intricacies in subfrontal approach incorporate anosmia, diabetes insipidus and frontal flap syndrome.³ The other natural methodology is transphenoidal, which is utilized in unadulterated intrasellar or with focal suprasellar expansion. On the off chance that the tumor is somewhat expelled by the transphenoidal approach, the lingering tumor can be extracted by subfrontal approach.⁴

Complications of transphenoidal approach incorporate injury to visual pathways, diabetes insipidus, huge cranial neuropathies and damage to the carotid courses⁵.

Satisfactory pre and postoperative hormonal appraisal ought to be performed in these patients in light of the fact that hormonal insufficiencies prompt poor result.⁶

METHODOLOGY

This descriptive and observational study was carried out at Department of Neurosurgery, Lahore General Hospital Lahore from fifteenth March 2013 to fifteenth September 2013. Thirty patients of sellar and suprasellar injuries who exhibited to the bureau of neurosurgery, Lahore General Hospital, Lahore were incorporated. The head was situated in slight augmentation. Bi-coronal skin entry point and scalp fold was made by sharp analyzation, safeguarding the supraorbital nerves reciprocally. Craniotomy was performed with the lower edge as low as conceivable at the supraorbital edge. The dura was opened on a level plane along the lower edge of the frontal flap to limit harm to the crossing over veins. Oneself holding mind retractors were utilized to withdraw the frontal flap to approach the sellar district. Under the magnifying lens, the tumor was analyzed from the encompassing structures. The pituitary stalk was protected also

RESULTS

The mean age of the patients was 27.93±17.79 years. There were 17 (56.7%) guys and 13 (43.3%) females. Six (20%) patients created postoperative diabetes insipidus while it didn't happen in 24 (80%) patients. To the extent tumor is concerned, pituitary adenoma was found in 14 (46.7%) patients, craniopharyngioma in 11(36.7%) patients, arachnoid blister in 2(6.7%) patients, benevolent monster

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cell tumor of the sphenoid bone in 1 (3.3%) quiet, olfactory section meningioma in 1 (3.3%) patient and keratin drops in 1 (3.3%) understanding. Karnofsky execution scale was 30 out of 9 (30%) patients, 60 out of 1 (3.3%), 70 of every 2 (6.7%), 80 of every 11 (36.7%) patients and 90 of every 7 (23.3%) patients.

Table 1: Age distribution of patients (n=30)

Age (Years)	No.	Percentage
Upto 10	5	16.7
11-20	9	30.0
21-30	2	6.7
31-40	7	23.3
41-50	3	10.0
51-60	2	6.7
61-70	2	6.7
Mean±SD	27.93±17.79	

Table 2: Incidence of tumors(n=30)

Tumor type	No.	%
Pituitary adenoma	14	46.7
Craniopharyngioma	11	36.7
Arachnoid cyst	2	6.7
Benign giant cell tumor of the sphenoid bone	1	3.3
Olfactory groove meningioma	1	3.3
Epidermoid	1	3.3
Total	30	100.0

P 0.001

DISCUSSION

The objective of surgery is add up to extraction of the tumor with protection of the optic mechanical assembly, veins and pituitary stalk. Understanding the life systems of this area is the way to achieve this objective. The careful methodology relies on the area of the tumor. On the off chance that the tumor is prevalently intra-sellar, the methodology is typically through a transsphenoidal course. It tends to be either trans-nasal or transthemoid. Favorable circumstances of the transthemoidal approach is short separation to the sella, negligible tissue analyzation and less odds of contamination, yet the impediments are diagonal view to the sella, anticosmatic and the danger of injury to neurovascular structures.⁷

Suprasellar tumors which attack the enormous sinus singularly are best drawn nearer by a frontotemporal transcavernous approach.^{8,9}

Add up to extraction of the tumor in the principal setting gives the best long haul result of the patients. The bigger the tumor, more will be the odds of harm to the imperative intracranial structures.¹⁰ The subtemporal approach is utilized for extraction of tumors reaching out into the back fossa,² however this methodology may effectively harm the worldly projection and careful perspective of this methodology is tight and badly arranged.

Baskin utilized subfrontal approach in 47% of his patients. The outcomes show that aggregate extraction of the tumor was accomplished in just seven patients, six of whom have had no repeat. In any case, 91% of the patients are abating and two kicked the bucket. The consequence of this examination is that subtotal evacuation pursued by radiotherapy is a satisfactory treatment for tumors.¹¹

Yasargil et al utilized various methodologies in an investigation of 144 patients. Add up to extraction of the tumor was accomplished in 90% of the patients and 7% had repeat. It proposes that essential aggregate expulsion of tumor yields the best long haul result for the patients. Subsequently, early determination at a phase when the tumor is still little, enhances the odds of finish expulsion and accomplishing great outcomes¹²

In our investigation, mortality is 23.3% while Symon and Sprich¹³ announced 24 patients experiencing radical extraction, the repeat rate was 4% and mortality was 17%, which is similar with our examination. In another investigation led by Fischer et al¹⁴ who treated 37 patients with sellar and suprasellar tumor, the rate of tumor repeat or inability to react to treatment was 57%. The general death rate was 8%.

CONCLUSION

It is concluded that injury dehiscence is altogether higher in ceaseless conclusion as contrast with interfered with conclusion for crisis midline laparotomy entry point for summed up peritonitis.

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