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Comparative Study of Various CP Angle Region Tumors in Western Rajasthan

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Abstract: ***Introduction*: Tumors of the cerebellopontine (CP) angle account for 5%-10% of all intracranial tumors. Schwannomas are the most common tumor with usual presentation as hearing loss and non-acoustic tumors usually presented with variety of symptoms and sign from headache to cranial nerve deficit to cerebellar features to brainstem compression features. *Aim*: Evaluation of the incidence of various CP angletumors in western Rajasthan and comparison of histopathology with surgical outcome and complications. *Methods*: A prospective study was conducted in Neurosurgery department of Dr. S. N. Medical College, Jodhpur, Rajasthan for 2 years duration from September 2019 to August 2021. Total 30 patients were evaluated during this period. Evaluation was done on demography, histopathology, clinical and radiological aspects and post-operative outcomes. Simple statistical methods like table and graphs were used. *Results*: Tumors of the CP angle account for 5%-10% of all intracranial tumors. Most common extra-axialCP angle tumor is Schwannoma (46%), followed by Meningioma (23%), Epidermoid (20%), Arachnoid cysts (15%).41-50 years is the most common age group involved. Schwannomas are common extra-axial CPA followed by meningiomas and others. Overall, most common presenting symptom was hearing loss, followed by headache, tinnitus and others. Complication was seen in 10cases in the form of cranial nerve deficit, hydrocephalous, cerebellar symptoms, hematoma and wound infection. *Conclusion*: Schwannomas are the most common tumor with usual presentation as hearing loss and non-acoustic tumors usually presented with variety of symptoms and sign from headache to cranial nerve deficit to cerebellar features to brainstem compression features.***

Keywords: Extra-Axial, Cerebellopontine Angle tumor, Brain tumor, Trigeminal neuralgia

1. Introduction

Cerebellopontine angle concerns with the region of brain located between the superior and inferior limbs of angular cerebellopontine fissure formed by the petrosal cerebellar surface folding around pons and the middle cerebellar peduncle[1].5th to 11th cranial nerve are located near or within the angular space between the two limbs commonly referred to as the Cerebellopontine angle. Tumors of the cerebellopontine angle account for 5%-10% of all intracranial tumors[2]. Acoustic neuromas (vestibular schwannomas), arising from the neurilemmal junction of the vestibular nerve, account for between 70%–80% of these tumors. Other sources of tumor in this region include the meninges (meningioma, arachnoid cysts), epidermal cell rests (giving rise to epidermoid cysts, dermoid cyst, and cholesteatomata), arachnoid villi/granulations and primary intrinsic lesions glioma, ependymoma), fat cells (lipomas), tumors extending from the cranial base (for example, glomus jugulare tumors), vascular lesions (haemangiopericytoma), and secondary tumors[3-4]. We designed a study to evaluate the outcomes of CP angle region surgery at tertiary center of western Rajasthan.

2. Material and Method

A prospective study was conducted on all patients admitted with diagnosis of CP angle space occupying lesion (SOL) in neurosurgery department of Dr. S. N. Medical College, Jodhpur in 2 years duration from September 2019 to August 2021. Patients were examined neurologically and sent for radiological investigations (MRI Brain) after routine investigation. Patients with decreased hearing were sent for audiometry. After making final diagnosis all patients underwent retromastoid suboccipital craniotomy and tumor excision. Outcome of surgery was monitored in the form of morbidity (cranial nerve or other neurological deficit) and mortality, comparison of histopathological diagnosis was done and Data reported. V-P shunting was done in patients with hydrocephalus preoperatively. Follow up of patient was done up to 3 months postoperatively. Statistical analysis was done by table and charts by comparison.

3. Results

A total of 30 patients were evaluated with the age between 15 to 60 years. Youngest been a 15 year old child with headache and oldest been a 60 year old male with headache and right sided hearing loss. Comparison in incidence of various CP angle tumors was done in various age groups (Table 1). Incidence of tumor was highest among the age group 40 to 60 (53%). About gender difference, a total of 19 patients were male (63 %) and a total of 11 patients were females (37%). The most common presenting complaint was progressive hearing loss (90%) followed by others (Table 2). Most common histopathological tumor been Schwannoma accounted for 53% of cases, followed by epidermoid 7cases

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(23%) and meningioma 4 cases (13%).3 case of Arachnoid cyst was reported among the patients (10%). Presentation of CP angle tumor was found after 4th decade. Schwannoma patients presented mainly in 5th and 6th decade and equal incidence was found in males and females, male: female-1: 1. Among meningiomas also presentation was in 5th and 6th decade and equal incidence among males and females. Epidermoids presentation were highest at younger age group, peak between age group 20 to 40, and incidence was higher in males than females, male: female-5: 2. About 22 patients required VP shunting prior to tumor excision and among these majority of cases were of schwannoma. In one patient post-operative mortality was noted, rest were discharged in hemodynamically stable condition. Complication was seen in 10cases in the form of cranial nerve deficit, hydrocephalous, cerebellar symptoms, hematoma and wound infection. (Figure 1)

Table 1: Age incidence of various CP angle tumors

Tumor type	< 10 yrs	11-20 yrs	21-30yrs	31-40 yrs	41-50yrs	51-60yrs	61-70yrs	Total
Schwannoma	0	1	2	1	5	4	1	14
Meningioma	0	0	0	2	1	2	1	6
Epidermoid Cyst	0	0	5	2	0	0	0	7
Arachnoid Cyst	2	1	0	0	0	0	0	3
Total	2	2	7	5	6	6	2	30

Table 2: Presenting Symptoms and number of patients

Symptoms	Schwannoma	Meningioma	Epidermoid	Arachnoid cyst
Hearing loss	11	2	4	0
Tinnitus	2	1	0	0
Headache	10	3	6	2
Dizziness	2	0	0	2
Facial numbness	5	0	6	1
Diplopia	5	3	3	0

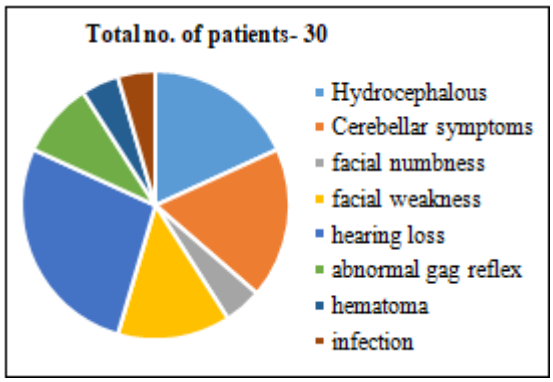

Figure 1: Postoperative complications of CP angle tumor surgery

4. Discussion

The aphorism "A CP angle tumor is an Acoustic neuroma (Vestibular schwannoma) Until proven otherwise" is well recognized by neurosurgeons. The purpose of this study was to analyze a large series of CP angle tumor & study the perioperative clinical and radiological data and postoperative results in 30 patients.5

In our study of evaluation of CP angle tumors, we evaluated 30 cases. Out of these 14 came out to be schwannoma, which reveals a percentage of 46%. These data match the previous study in literature which suggests 70%-80% incidence[6-7]. Though prevalence in literature is more in females, we have an equal incidence among males and females in patients of schwannoma.8Clinical features among the patients with vestibular schwannoma in the present study are similar to those previously reported. The high percentage of patients with unilateral sensorineural hearing loss emphasizes the importance of excluding the diagnosis of vestibular schwannoma in such a patient population. Epidermoid presents early as compared to schwannomas and meningiomas and tends to involve multiple cranial nerves along with a hearing deficit[9]. Epidermoids are also higher among the male population rather than females. As per literature, epidermoids are common at an early age which is found in our study, and also the involvement of multiple cranial nerves is seen. Though the literature suggests gender equality in epidermoids, in our study epidermoids are common in males compare to females. The incidence of CPA epidermoids in patients with Trigeminal neuralgia has also been variously reported as 0.2 to 5.5% in the literature.1[0, 11, 12, 13]We treated 6 patients with TN who had meningiomas and 5 patients with TN who had schwannomas in the same study. Meningiomas though less incidence among study population but the presentation was the same as per literature in 5th and 6th decade and an equal prevalence among males and females. Though most patients present at late stages of CP angle tumors but outcome following surgery was good and there was improvement among patients with cranial nerve deficit over the period of time[14]. Despite meticulous surgical techniques we could not achieve expected results in some cases and faced some new complications. (Figure 1). Improvement in the hearing was not seen in some of the patients who had earlier profound hearing loss. Little information regarding the association of HCP and CPA tumors has been published, particularly with regard to schwannomas and meningiomas, the diagnosis is made either clinically by the presence of typical symptoms (either normal pressure HCP or high intracranial pressure) that are not related to the tumor mass itself or radiologically by the presence of ventricular enlargement[15, 16]. In our study 22 patient had preoperative hydrocephalus, for whom preoperative ventriculo-peritoneal shunting was done. Hydrocephalus did not subside in 3 cases postoperatively and in one case new onset of hydrocephalus was noted due to hematoma in the CP angle region postoperatively. In comparison with previous studies, all complications were found in almost the same incidence[17, 18]. Hearing deficit and facial weakness were found most commonly in patients with vestibular schwannoma. Other complications were found to be associated with CP angle region surgery, not specifically biased to any tumor type. The Retromastoid approach is familiar with neurosurgeons in our institution and it leads to

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fewer post-operative complications among patients of CP angle tumors. As only one mortality and no additional deficit in patients post-operatively.

5. Conclusion

CP angle tumor presents usually with hearing loss, though cranial nerve and cerebellar symptoms may be present in some. Usual presentation is at later stages with large size of tumor and usually total hearing loss. Due to big size of tumor hydrocephalus is common association with tumors and VP shunt is needed prior to surgery. Schwannomas are the most common tumor with usual presentation as hearing loss and non-acoustic tumors usually presented with variety of symptoms and sign from headache to cranial nerve deficit to cerebellar to brainstem compression features.

Early intervention leads to better outcome and less post-operative morbidity. Size also an important factor in post-operative outcomes, as small size tumors leads to less complications.

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