



# INCIDENCE OF FACIAL DISABILITY IN PATIENTS WITH CEREBELLOPONTINE ANGLE TUMOUR RESECTION-A RETROSPECTIVE STUDY

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## ABSTRACT

**BACKGROUND AND PURPOSE:** The cerebellopontine angle tumours(CPA) are usually benign and their complete removal leads to the recovery of the patient. The very complex anatomical structure of CPA leads to neurological dysfunction to the structures involving in this region. The most common complications following radiosurgery are cranial neuropathy, hydrocephalus, and brainstem/cerebellar injury. Complications following surgery include headache, hemorrhage, stroke, vascular injury, infection, cranial nerve injury, tumour recurrence, CSF leak, and death.Facial palsy is one of the complication that causes the facial disability of the patient post resection. Postoperative facial nerve weakness significantly resolves with time but the transient paresis causes physical disability along with psychosocial problems. Monitoring and treatment of delayed post operative cranial nerve VII palsy and radiosurgery are important aspects that should be better focused.

**AIM:**The aim of the study was to evaluate the incidence of facial disability in patients with cerebellopontine angle tumour resection.

## OBJECTIVES

1. To evaluate the severity of facial nerve paralysis by using House-Brackmann facial grading scale
2. To evaluate the facial disability through facial disability index questionnaire.

**METHODOLOGY:** Patients who have already underwent cerebellopontine angle tumour resection during the period of March 2018-December 2021 were initially contacted through telephone and were informed to attend the Neurosurgery outpatient department at SVIMS Tirupati for review, those subjects whoever met the inclusion criteria post tumor resection were informed about the study and consent was taken. Subjects whoever were willing to participate in the study visited the Neurosurgery outpatient department for review and they were observed and evaluated for facial nerve paralysis.Subjects who had difficulty to visit the OPD for the review,willing to participate were observed and evaluated through virtual mode.

**STATISTICAL ANALYSIS:** Analysis of the data was done and pie charts were drawn for the percentage obtained for each grade according to HBFSGS (1-6). Percentage of incidence of facial nerve palsy among both the genders were represented in separate pie diagrams. Another pie chart diagram represented the percentage of facial disability that was calculated using FDI questionnaire through which the scores were screened and level of disability was found out.

**RESULTS:** Results showed that there is a significant incidence of facial disability in patients post tumour resection and there is a need for facial rehabilitation following the resection.

**CONCLUSION:** Results suggest that there is a need for facial rehabilitation following Cerebellopontine angle tumour resection so that facial palsy can be corrected and the facial functioning along with the facial disability Index can be improved as well.

**KEY WORDS:** CPA tumour , Facial nerve palsy, Facial disability, House-Brackmann facial grading scale, Facial disability index questionnaire.

## INTRODUCTION

- The term "Brain tumour" refers to mixed group of neoplasms originating from intracranial tissue and the meninges with degree of malignancy ranging from benign to malignant. The native structures of the cerebellopontine angle are the source of two expressions of neoplasia such as schwannoma and meningioma as well as few space occupying lesions, such as the arachnoid cyst, giant aneurysms and arteriovenous malformations.[1]
- The cerebellopontine angle is a region of highly intricate anatomy which is located in the lateral area of the brain.[ 2,3]
- Cerebello pontine angle tumours are defined and confined to area of cerebellopontine angle. Cerebellopontine angle tumours account for about 5%-10% of all intracranial tumours.[4]
- The extraneous products of the embryonic development contribute different tissue to the Cerebellopontine angle, from where other rare tumours take origin such as dermoid and epidermoid cysts.
- These tumours usually appear within the parenchyma area or outside the parenchyma area and affect the cranial nerves, especially affect the facial nerve and vestibulocochlear nerve. Complete axonal disruption of facial nerve results from various etiologies.[5]
- Facial paralysis has potentially devastating functional and psychological consequences for patients.
- Facial nerve is a mixed nerve consisting of motor sensory and parasympathetic fibres.[6]
- The facial nerve preservation post surgery needs monitoring so as to know the facial muscle weakness post resection of the CPA tumour.[6]
- For patients with poor prognosis of facial nerve function, if it was not possible to perform anatomical preservation during surgery, Facial nerve plastic surgery is recommended to repair the nerve (masseter nerve-facial nerve anastomosis). If the anatomical preservation was done during surgery, the strict rehabilitation should be followed up and the recovery of Facial nerve function should be persistently observed.[6]
- Facial palsy or even transient paresis of the face causes facial disability post CPA tumour resection and it may lead to patient morbidity.[7,8]
- The neurofibromatosis 2 is the causative risk factor noted as the origin for the tumour of CPA region, the exact pathogenesis is through genomic inactivation of NF2 via loss of chromosome 22q or NF2 gene mutation.
- The main aim of surgical management is complete tumour removal while preserving neurologic function as far as possible.

## NEED OF THE STUDY

1. Post surgical CPA tumour patients there is facial muscles weakness due to paresis of facial nerve.
2. Majority of studies had shown that there is damage of facial nerve and weakness of facial muscles following the surgery of CPA tumour , but it has been found that is lack of awareness and consistency in exercise adherence with respect to facial rehabilitation.
3. This study focuses on screening the degree of facial nerve recovery, on presence of synergic, autonomous synkinesis ,mass movement and spasm of facial muscles in subjects with CPA tumour resection.
4. The purpose of this observation at the study is to throw light on incidence of facial disability in post surgical CPA tumour patients and to evaluate the facial muscle weakness so as to educate the patient about the need to adhere to exercises and for the further follow up with the department of physiotherapy.

## AIM OF THE STUDY

The aim of the study is to evaluate the incidence of facial disability in patients with cerebellopontine angle tumour resection.

## OBJECTIVES OF THE STUDY

- To evaluate the weakness of facial paralysis by using House brackmann facial grading scale in patients who had underwent CPA tumour resection.
- To evaluate level of facial disability following tumour resection by facial disability index.

**MATERIALS AND METHODOLOGY****MATERIALS:**

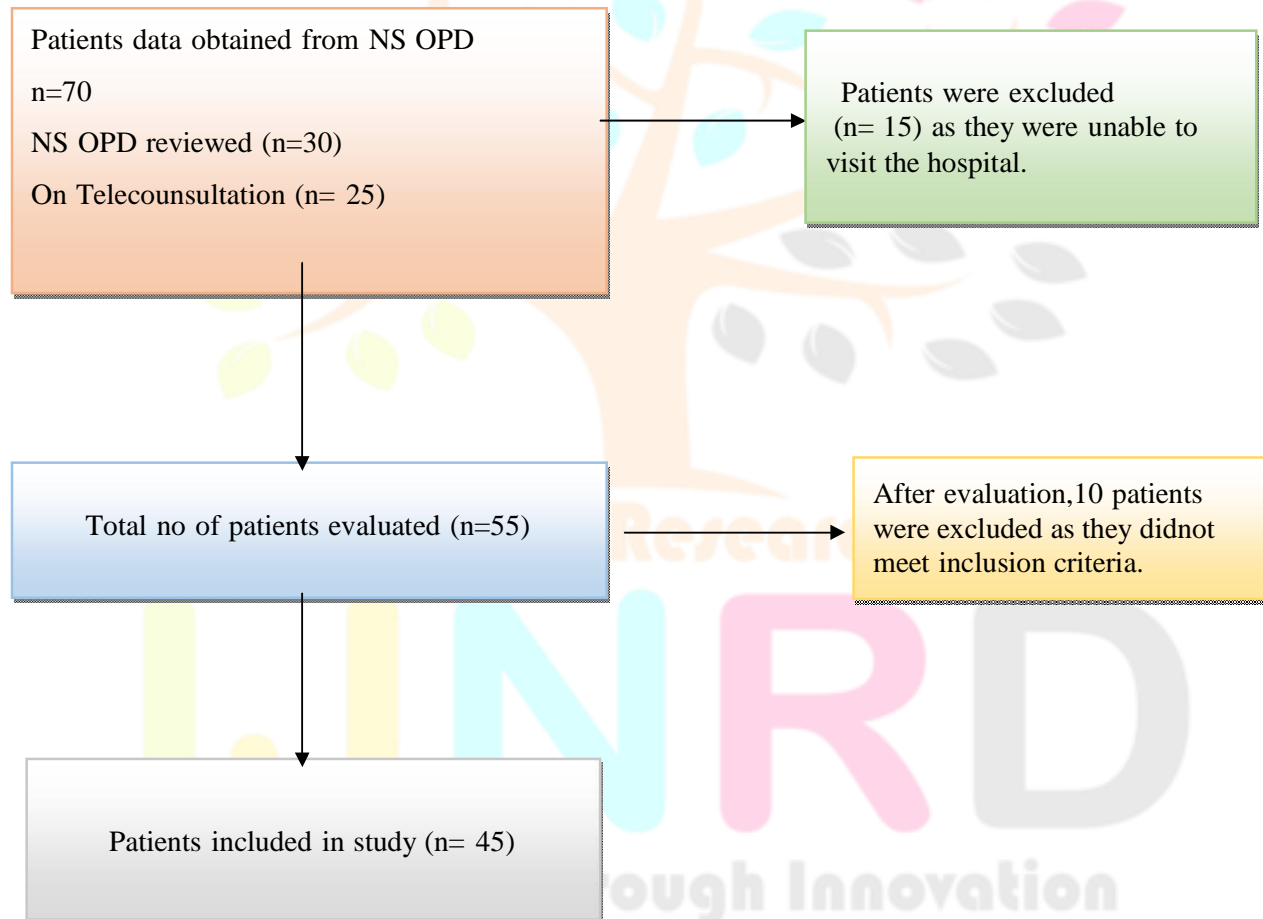
1. House-Brackmann facial grading scale
2. Facial disability Index questionnaire
3. Medical records

A retrospective study was done by using patient data from Neurosurgery department SVIMS Tirupati. Study Design:

- Retrospective study
- Study Sample Period: March 2018-December 2021
- Source of Data: Neurosurgery department, OPD
- Study Duration: December 2021-August 2022

**METHODOLOGY**

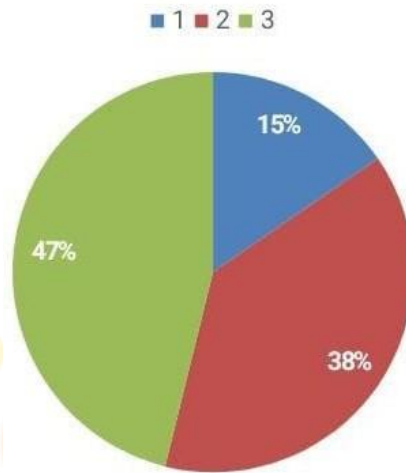
This study has been conducted at Neurosurgery OPD at SVIMS Tirupati, patients who had undergone CPA tumour resection during the period March 2018 –December 2021 were called for review to Neurosurgery OPD. Those subjects who ever signed the consent form were evaluated for facial muscle weakness, deviation of mouth and graded according to HBFGS and level of disability was screened out using FDI questionnaire. Those patients who ever were unable to attend for the review at the time of the study at NS OPD were evaluated and screened after taking consent through virtual mode via mobile.

**CONSORT FLOW DIAGRAM**

**STATISTICAL ANALYSIS**

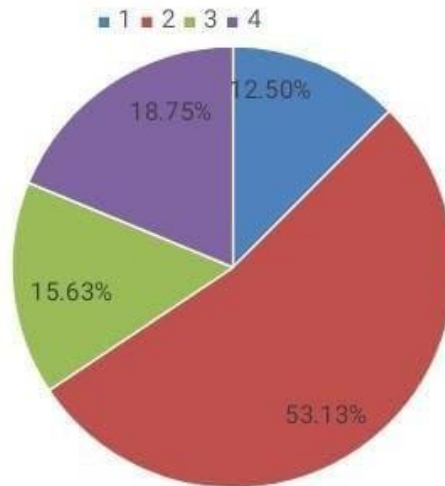
Subjects were initially observed and graded according to HBFGS. The data was taken and entered inspreadsheet after which data analysis was done through MS excel spread sheet.

**% OF MEN**

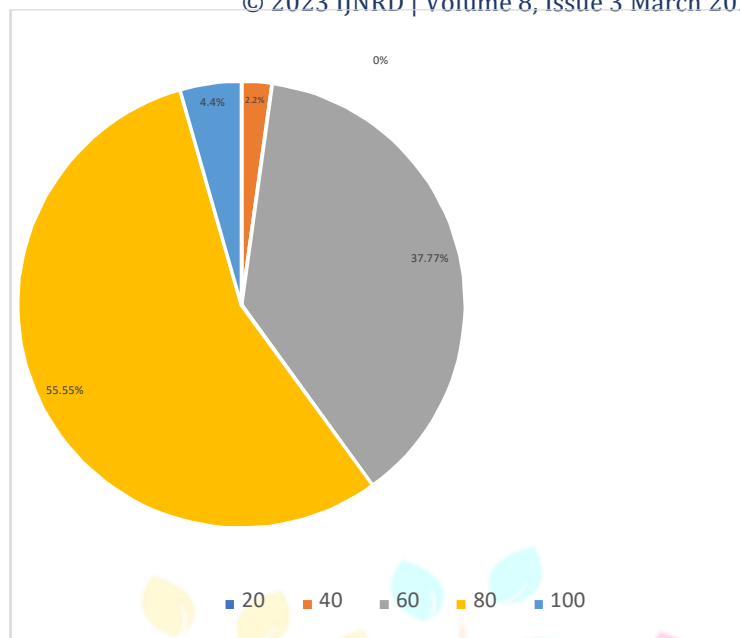


The percentage of incidence of each grade in men was represented in above pie chart. Subjects with grade 3 of HBFGS represents highest incidence of facial nerve paralysis with 47% in men and there found to be 0 incidence of subjects with grade 4,5,6. Subjects with grade 1 and 2 were found with an incidence of 15% and 38% respectively.

**% of WOMEN**



The above pie represents the data of incidence of facial paralysis in women subjects observed and evaluated by using HBFGS. Subjects with grade 2 are high in incidence with 53.13% followed by grade 3 where the incidence is noted as 15.63% subjects with grade 5 and 6 facial paralysis were found to be as 0 incidences. Subjects with grade 1 and 4 are with 12.50% and 18.75% incidence respectively.



Limits >/=	20	40	60	80	100
No of subjects	0	1	17	25	2
Percentage	0%	2.22%	37.777%	55.55%	4.44%

The data of the subjects was entered into spread sheet and ms excel is used to draw the analysis after entering the FDI questionnaire total score. Data was analysed using MS excel spreadsheet. The results showed the highest incidence of facial disability as 55.5% with FDI score ranging from 60-80. The least is of 0 where there are no subjects from 0-20 score of FDI. Subjects within the range of 40-60 of FDI score are with 37.7% of total incidence. Subjects with FDI score ranging from 20-40 and 80-100 are with 2.2% and 4.4% respectively.

## RESULTS

The results showed there is significant incidence of facial paralysis and decreased Level of facial disability in patients who have already undergone CPA tumour Resection.

## CONCLUSION

The present study evaluated the percentage of incidence of facial disability in subjects with CPA tumour resection which emphasized on the aspect of facial rehabilitation and the need for exercise adherence.

This study concluded that facial paralysis is a most common complication seen in subjects with CPA tumour resection which has to be monitored and managed through facial rehabilitation.

## LIMITATIONS

1. The limitation of the study is that HBFSGS was not evaluated prior to tumour resection.
2. After evaluation, Subjects were referred to the physiotherapy centres but further follow up was not done.

## RECOMMENDATIONS

1. Pre post rehabilitation HBFSGS evaluation of subjects helps in comparing the level of facial disability.

## REFERENCES

1. Dr Patricia A McKinney Paediatric Epidemiology Group, Unit of Epidemiology and Health Services Research, University of Leeds, 32 Hyde Terrace, Leeds LS2 9LN, UK; Brain tumours: incidence, survival, and aetiology: 2012 vol:26, 67-74
2. Abiswas pk, sardar mh, saha gc, hossain mz, hossain ms, paul t, azad kak. Evaluation of extra axial cerebellopontine angle tumours through MRI. Journal of Dhaka medical college 2018 volume;26 :6-10
3. Dr.muthu retnam .T Programme: M.Ch. NEUROSURGERY Month and year of submission: November - 2002-Cerebellopontine angle lesion.vol:1:41-47
4. Raqeeb Haque 1, Teresa J Wojtasiewicz, Paul R Gigante, Mark A Attiah, Brendan Huang, Steven R Isaacson, Michael B Sisti. Efficacy of facial nerve-sparing approach in patients with vestibular schwannomas.2011 novomener 115(5):917-23.
5. Albathil, Sam Oyer , Lisa E Ishii , Patrick Byrne , Masaru Ishii , Kofi O Boahene Early Nerve Grafting for Facial Paralysis After Cerebellopontine Angle Tumour Resection With Preserved Facial Nerve Continuity.JAMA plastic surgery-2016 Jan-Feb;18(1)P:54-60
6. Oystein Vesterli Tveiten, Mathew L Carlsen, Frederik Goplen, Erling Myrseth, ColiN L w Driscoll, Rapuvathana Mahesparana. Patient-versus physician-reported facial disability in vestibular schwannoma: An international cross-sectional study December 2016 Journal of Neurosurgery vol 127(5): page 1-10
7. John Lee, MD; Kevin Fung, MD, FRCSC; Steven P. Lownie, MD, FRCSC, FACS; et al Lorne S. Parnes, MD, FRCSC Assessing Impairment and Disability of Facial Paralysis in Patients With Vestibular Schwannoma 2007;133(1):56-60
8. Przemysław Kunert, Beata Smolarek, Andrzej Marchel. Facial nerve damage following surgery for cerebellopontine angle tumours. Prevention and comprehensive treatment. Neurol Neurochir Pol.2011 Sep-Oct;45(5):480-8

