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## Case Report

# Postoperative CP angle tumor leading to dysphagia: A case report

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## Abstract

Cerebellopontine angle (CPA) tumors belong to a diverse group of benign and malignant tumors that arise in the region between the cerebellum and pons. These tumors can cause a variety of symptoms which include but are not restricted to hearing loss, tinnitus, facial numbness, dizziness, and dysphagia. Dysphagia is a common symptom of patients with CPA tumor as it leads to compression of cranial nerves responsible for swallowing. Surgical removal of the same can also cause dysphagia due to inflammation in the area surrounding tumor site. Dysphagia can significantly impact a patient's quality of life, making it difficult to eat and drink safely and effectively thus leading to malnutrition, dehydration, and aspiration pneumonia. This case report features a 26-year-old female patient who developed dysphagia following surgery for vestibular schwannoma, a benign CPA tumor. Screening and instrumental evaluation of swallowing suggested a moderate degree of oral and pharyngeal phase dysphagia. A customized therapy plan was made putting emphasis on dietary modification, compensatory and therapeutic techniques. This case report highlights the significance of adopting an interdisciplinary approach in the management of dysphagia.

**Keywords:** Cerebellopontine angle tumor, Dysphagia, Swallowing therapy, Effortful swallow, Mendelsohn

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## 1. Introduction

A triangular region marked by the pyramid anteriorly, the tentorium superiorly, pons medially, cerebellum dorsally and the petrous part of temporal bone to its antero-medial side is named as cerebellopontine angle (CPA). By virtue of its location, CPA holds anatomical as well as clinical importance as this region is occupied by the CPA cistern. CPA cistern accommodates the cranial nerves V, VI, VII, and VIII. It is also known to fall in the course of anterior inferior cerebellar artery.<sup>1</sup> Cerebellopontine angle (CPA) tumors belong to a group of benign and malignant tumors that arise in the CPA with low potential for malignancy (approximately 1%).<sup>2</sup> CPA tumors are the most common neoplasms in the posterior cranial fossa, which accounts for 6–10% of all intracranial tumors.<sup>3</sup> Patients with posterior fossa tumors (PFTs) usually exhibit clinical symptoms such as increased intracranial pressure, focal neurological deficits with deformities in the

brain stem, and cranial nerves.<sup>4</sup> These structures are essential in the precise and efficient execution of swallowing. Therefore, dysphagia might occur as a clinical manifestation of the tumor in place or after its surgical removal.<sup>5</sup> Immediate postoperative occurrence of dysphagia accounts for at least 31% of all cases with dysphagia post CPA tumor removal.<sup>6</sup> The risk of dysphagia after CPA tumor surgery depends on a number of factors, including the size and location of the tumor, surgical approach used, and the patient's unique anatomy. Patients with large tumors or tumors that are located close to the nerves involved in swallowing are at higher risk of developing dysphagia.<sup>7</sup> The severity of dysphagia after CPA tumor surgery can also vary widely. Some patients may just have mild form of it, while others may have severe dysphagia that requires tube feeding. Early identification of individuals who are at risk of dysphagia is important as it helps in providing early therapeutic and diagnostic care in order to

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The Mann Assessment of Swallowing Abilities (MASA) was used to evaluate the stage and severity of dysphagia. On administration, the total score obtained was 155, which suggested a moderate degree of oral and pharyngeal phase dysphagia (**Table 2**).

**Table 2:** MASA scoring.

Domain	Scoring
Alertness	10
Cooperation	10
Auditory Comprehension	10
Respiration	10
Respiratory rate for swallow	5
Dysphasia	5
Dyspraxia	5
Dysarthria	4
Saliva	4
Lip seal	3
Tongue movement	8
Tongue strength	8
Tongue coordination	10
Oral preparation	6
Gag	3
Palate	6
Bolus clearance	5
Oral transit	6
Cough reflex	3
Voluntary cough	8
Voice	6
Trache	10
Pharyngeal phase	5
Pharyngeal response	5

### 3) Instrumental

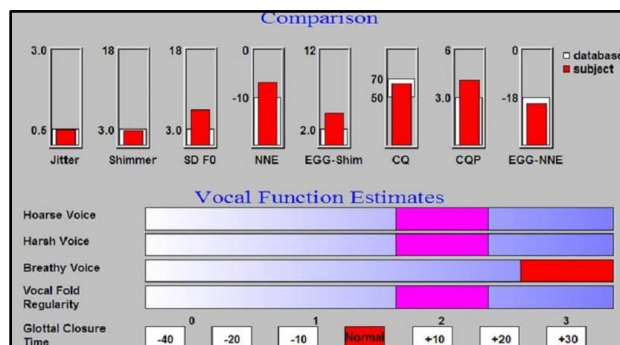
As a part of instrumental evaluation, Video Fluoroscopy, Video Laryngoscopy and Electrolottography (EGG) were carried out.

Video Fluoroscopy findings revealed mild dysphagia in the oral preparatory, oral and pharyngeal stages of swallowing. This was characterized by anterior spillage, mild lingual, vallecular residue (weak lingual tone) and a swallow reflex delay (**Table 3**).

**Table 3:** Video fluoroscopic findings.

Stages of swallow	Findings
Oral preparatory + Oral	Anterior spillage of material during oral preparatory stage of swallow. Mild residue on tongue surface post swallow. Delayed oral onset before bolus was propelled posteriorly.
Pharyngeal	Mild delay in pharyngeal reflex to the level of valleculae Mild residue in valleculae post swallow.
Esophageal	Esophageal screen not completed

Video Laryngoscopy findings revealed swollen left pyriform fossa, immobile left vocal cord and aryepiglottic folds. Moderate hoarse voice with severe breathy component and moderate vocal fold irregularity were found on EGG (**Figure 3**).

**Figure 3:** Vocal parameters (using Dr. Speech)

### 4. Management

An individualized intervention plan was made with the objective of restoring oral feeding while continuously ensuring appropriate nutrition and hydration as well as safe swallowing. Treatment regime included diet modification, compensatory and therapeutic strategies. The dietary modification involved advice from SLP and dietician who ensured that the clinical suggestions were balanced with the patient's nutritional requirements. Changing the consistency of food and liquids was the key aspect of it. Compensatory strategies included postural adjustments and oral sensory awareness. In this case, chin-up posture was found to be the best position that improved oral bolus transit. Thermo-tactile stimulation (presenting a cold bolus) was initially presented as part of the sensory stimulation program. Multiple taste stimuli (such as lemon juice, sugar, and salt) were also used for this purpose. Once the patient began to consistently react to these stimuli over the course of sessions, the texture of the bolus was changed to one that required chewing. Therapeutic strategies mainly included oro-motor and swallowing exercises such as effortful swallow, supraglottic swallow and Mendelsohn technique.

#### 4.1. Outcome of treatment

Up on re-evaluation after one month of intensive swallowing therapy, the patient demonstrated no signs of dysphagia and aspiration.

**Table 4** shows post treatment MASA score, which improved from 155 to 189. It also shows that oro-motor control exercises, such as range-of-motion and resistance drills for the tongue, lip, and jaw improved the oro – musculature strength and resistance thus resulting in better bolus formation and prevention of anterior spillage of bolus.

**Table 4:** Comparison of Pre- & Post- therapy outcomes

Pre-therapy	Post-therapy
MASA Score – 155	MASA Score - 189
Severity – Moderate	Severity - No abnormality
Difficulty initiating swallowing and clearing bolus	No difficulty in swallowing and clearing bolus
Aspiration and choking while swallowing	No signs of aspiration or choking
Cough during and after a meal	No cough during swallowing
Poor oro-musculature strength and resistance	Adequate oro-muscular strength and resistance

## 5. Discussion

The overall impact of dysphagia following CPA tumor removal is debilitating in an individual's life.<sup>6</sup> The detrimental effects of such disorders are not only restricted to the level of feeding and communication but also hamper social existence of a person.<sup>10</sup> The current case study is an attempt to present detailed assessment and management of dysphagia in a patient with post-operative vestibular schwannoma, a benign CPA tumor.

The assessment procedures included video fluoroscopy, video laryngoscopy, EGG, MASA, audiological test profile and other speech and language screening and diagnostic tools. Among all procedures Video fluoroscopy, video laryngoscopy are crucial in identifying anatomical deformity while MASA provides information about severity of dysphagia and aspiration.

The treatment approaches were focused to improve the patient's quality of life and reduce their risk of malnutrition and aspiration. The aim of the management plan for the patient was two dimensional: firstly, to strengthen oro-motor functioning and secondly, to facilitate swallowing. To strengthen oro-motor functioning, oro-motor control exercises were employed. To facilitate swallowing functions, effortful swallow, supraglottic swallow and Mendelsohn maneuver techniques were employed. These exercises were beneficial in managing the oral and pharyngeal phases of dysphagia.

Similar case study had been conducted on post-operative oro-pharyngeal dysphagia after surgical removal of metastatic tumors in the cerebellum.<sup>11</sup> The study focused on controlling limited upper esophageal sphincter opening during swallowing using chin tuck, head rotation, effortful swallow, jaw exercises and Mendelsohn maneuvers to reduce aspiration and enhance bolus clearance.

## 6. Conclusion

Dysphagia is a common complication that may arise following CPA surgery. However, timely diagnosis and appropriate management can lead to a positive outcome for most patients. Moto of presenting this case report was to emphasize the management of a patient with a CPA tumor, incorporating appropriate investigations and intervention strategies and adopting an interdisciplinary approach to the management of dysphagia. Furthermore, this study highlights the need to use an individualized intervention plan in managing dysphagia.

## 7. Source of Funding

None.

## 8. Conflict of Interest

None.

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