Postoperative speech impairment

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- Effects of Neuromuscular Electrical Stimulation on Chronic Dysphagia in a Single Subject after Anterior Cervical Discectomy and Fusion Surgery: A Case Report
- Scoping review of communication impairment management in adults with brain tumours
- Cerebellar Mutism/Posterior Fossa Syndrome Following Resection of Posterior Fossa Tumor in Pediatric Patients: Assessing Pathophysiology, Risk Factors, and Neuroradiographic Features
- Time Course and Predictors of Persistent Postoperative Dysphagia in Patients with Congenital Heart Disease Following Cardiac Surgery
- Swallowing Function After Pioneering Partial Face and Whole Eye Transplant: Clinical Insights
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- Expert consensus on auditory intervention and language rehabilitation of CHARGE syndrome

Postoperative speech impairment refers to a decline or alteration in a patient's ability to speak after undergoing a surgical procedure. This condition can range from mild word-finding difficulties to complete loss of speech (aphasia), and may be temporary or permanent, depending on several factors.

Common Causes of Postoperative Speech Impairment

Neurosurgical procedures:

Surgeries involving the dominant hemisphere (especially the left frontal or temporal lobes) can affect Broca's or Wernicke's areas.

Brain tumor resections, epilepsy surgery, or AVM clipping.

Stroke or ischemia during or after surgery.

Anesthesia-related complications:

Hypoxic events (low oxygen during surgery).

Prolonged intubation causes vocal cord injury.

Cranial nerve injury:

Injury to cranial nerves IX, X, or XII may affect articulation or phonation.

Edema or mass effect:

Postoperative swelling can temporarily impair speech centers or tracts.

Psychogenic causes:

Postoperative stress, delirium, or conversion disorders.

Clinical Evaluation

Neurological exam: Assess fluency, comprehension, repetition, naming, reading, and writing.

Imaging: MRI or CT to rule out new ischemic events, edema, or hemorrhage.

Laryngoscopy: If vocal cord dysfunction is suspected.

Neuropsychological testing: For subtle deficits or rehabilitation planning.

Types of Speech Impairments

Dysarthria: Impaired articulation due to muscle weakness or incoordination.

Aphasia: Language dysfunction (e.g., expressive, receptive, global).

Apraxia of speech: Motor planning disorder, not due to weakness.

Management Strategies

Speech and language therapy (SLT): Early and tailored intervention.

Medical treatment: Reduce cerebral edema (e.g., steroids), manage seizures.

Surgical revision: In rare cases, to relieve pressure or reposition structures.

Multidisciplinary care: Neurologists, neurosurgeons, ENT, rehabilitation teams.

Prospective multicentre cohort studies

A multicentre European study addresses a longstanding question in pediatric neurosurgery outcomes: is tumor volume associated with the risk of developing cerebellar mutism Syndrome (CMS), particularly its core feature—postoperative speech impairment (POSI)?

The study prospectively evaluated 360 children undergoing surgery for posterior fossa tumors, with speech status assessed within two weeks post-op and categorised into habitual speech, reduced speech, severely reduced speech, and mutism. Preoperative MRI was used to calculate tumour volume using BrainLab Elements SmartBrush™ [1].

Strengths

Robust sample size from multiple European centres enhances generalisability.

Semi-automated volumetric analysis reduces measurement bias.

Stratified risk model for medulloblastoma offers actionable clinical value.

Key Findings

No association was found between tumor volume and POSI when considering all tumor types.

A significant correlation was discovered for medulloblastoma: every 1 cm^3 increase in volume slightly elevated the risk of POSI (OR 1.04).

An optimal cut-off volume of 16.5 cm^3 was identified. Children with medulloblastoma below this threshold had a 13% risk, while those above faced a 50% risk.

Limitations

The finding applies only to medulloblastomas, limiting generalisability across posterior fossa pathologies.

Functional outcomes beyond speech (e.g., cognition, motor) were not assessed.

The predictive value of the model needs external validation in non-European cohorts.

Implications for Clinical Practice

This study presents a clear volumetric threshold for assessing POSI risk in children with medulloblastoma. It underscores the value of preoperative planning not just for technical feasibility but also for predicting neurological outcomes. The proposed cut-off can help guide shared decision-making and family counselling, as well as prompt early speech therapy referral in high-risk cases.

Final Thoughts

While the overall volume of posterior fossa tumours may not be a universal predictor of postoperative speech impairment, this paper sheds light on a valuable exception. The findings for medulloblastoma could be incorporated into future risk models and decision-support systems in paediatric neuro-oncology.

1)
Laustsen AF, Avula S, Grønbæk J, Pizer B, Nyman P, Nilsson P, Frič R, Hjort MA, Beneš V, Hauser P, Pálmafy B, Rutkauskiene G, Wilhelmy F, Brandsma R, Sehested A, Mathiasen R, Juhler M. Tumour volume as a predictor of postoperative speech impairment in children undergoing resection of posterior fossa tumours: a prospective, multicentre study. Acta Neurochir (Wien). 2025 Apr 3;167(1):97. doi: 10.1007/s00701-025-06459-x. PMID: 40178678.