

Functional Outcome of Speech, Voice and Swallowing Following Excision of Glomus Jugulare Tumor

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Abstract : Background: Glomus jugulare tumors arise within the jugular foramen and are commonly seen in females particularly on the left side. Surgical excision of the tumor may cause lower cranial nerve deficits. Cranial nerve involvement produces hoarseness of voice, slurred speech, and dysphagia along with other physical symptoms, thereby affecting the quality of life of individuals. Though oncological clearance is mainly emphasized on while treating these individuals, little importance is given to their communication, voice and swallowing problems, which play a crucial part in daily functioning. Objective: To examine the functions of voice, speech and swallowing outcomes of the subjects, following excision of glomus jugulare tumor. Methods: Two female subjects aged 56 and 62 years had come with a complaint of change in voice, inability to swallow and reduced clarity of speech following surgery for left glomus jugulare tumor were participants of the study. Their surgical information revealed multiple cranial nerve palsies involving the left facial, left superior and recurrent branches of the vagus nerve, left pharyngeal, left soft palate, left hypoglossal and vestibular nerves. Functional outcomes of voice, speech and swallowing were evaluated by perceptual and objective assessment procedures. Assessment included the examination of oral structures and functions, dysarthria by Frenchey dysarthria assessment, cranial nerve functions and swallowing functions. MDVP and Dr. Speech software were used to evaluate acoustic parameters of voice and quality of voice respectively. Results: The study revealed that both the subjects, subsequent to excision of glomus jugulare tumor, showed a varied picture of affected oral structure and functions, articulation, voice and swallowing functions. The cranial nerve assessment showed impairment of the vagus, hypoglossal, facial and glossopharyngeal nerves. Voice examination indicated vocal cord paralysis associated with breathy quality of voice, weak voluntary cough, reduced pitch and loudness range, and poor respiratory support. Perturbation parameters as jitter, shimmer were affected along with s/z ratio indicative of voice fold pathology. Reduced MPD(Maximum Phonation Duration) of vowels indicated that disturbed coordination between respiratory and laryngeal systems. Hypernasality was found to be a prominent feature which reduced speech intelligibility. Imprecise articulation was seen in both the subjects as the hypoglossal nerve was affected following surgery. Injury to vagus, hypoglossal, gloss pharyngeal and facial nerves disturbed the function of swallowing. All the phases of swallow were affected. Aspiration was observed before and during the swallow, confirming the oropharyngeal dysphagia. All the subsystems were affected as per Frenchey Dysarthria Assessment signifying the diagnosis of flaccid dysarthria. Conclusion: There is an observable communication and swallowing difficulty seen following excision of glomus jugulare tumor. Even with complete resection, extensive rehabilitation may be necessary due to significant lower cranial nerve dysfunction. The finding of the present study stresses the need for involvement of a speech and swallowing therapist for pre-operative counseling and assessment of functional outcomes.

Keywords : functional outcome, glomus jugulare tumor excision, multiple cranial nerve impairment, speech and swallowing

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