



MANAGEMENT OF ORO PHARYNGEAL DYSPHAGIA SECONDARY TO SURGICAL EXCISION OF VESTIBULAR SCHWANNOMA- A SINGLE CASE STUDY

Divya Sivagnanapandian

Lecturer, Department of Speech Language Pathology. MERF Institute of Speech and Hearing, Chennai.

Ms. Divya.S*

Lecturer, Department of Speech Language Pathology, MERF- Institute of Speech and Hearing, New No: 1, Old No: 1/1 South Canal Bank Road, Mandaivelipakkam. Chennai.Tamilnadu, India. *Corresponding Author

ABSTRACT

Dysphagia is defined as difficulty in swallowing food (Smithard D.G, 2007). The prevalence of dysphagia varies depending on the concomitant medical disorders. A population-based study found the overall prevalence of dysphagia to be 13.5%. Conditions that are commonly associated with dysphagia are stroke, infectious diseases, trauma and neurodegenerative diseases. Dysphagia occur due to post operative removal of tumour. This case report is about an individual who undergone surgical excision of Vestibular schwannomas (VS) at cerebellopontine angle (CPA; 80–95%) that resulted a lower cranial nerve paresis and dysphagia. Swallowing assessment; management of dysphagia and the client's progress were documented.

KEYWORDS : Dysphagia, Vestibular schwannomas, Lower cranial nerve paresis, swallowing

INTRODUCTION

Vestibular schwannomas (VS) are the most common tumours of the cerebellopontine angle. Preservation of neurological function and elimination of complications is a principal goal of any surgical procedure on excision of tumour. The facial numbness caused by trigeminal paresis (incidence 0–4.7%) Darrouzet et. al (2004). The lower cranial nerves can be injured during removal of large vestibular schwannomas, which should impinge on jugular foramen contents and CN IX, X, and XI. Lanman & Brackmann (1999); Wiet & Raslan (1986) . Acute lower cranial nerve deficits could result in dysphagia and aspiration. In some cases, it is necessary to provide nutrition through a nasogastric feeding tube or to prevent the risk of aspiration. Re-education and rehabilitation of swallowing techniques and manoeuvres are crucial for management. In cases with severe problems and risk of aspiration pneumonia, tracheostomy and percutaneous endoscopic gastrostomy can be an option. Swallowing and voice outcomes following surgical excision of acoustic neuromas (vestibular schwannomas)are rarely reported and poorly studied. It is understood that facial nerve palsy can result in difficulty with eating and drinking and that compensatory efforts can be of benefit for optimizing oral intake (deSwart BJ. et. al, 2003)

CASE REPORT

The client came to the department of Speech Language Pathology with the complaint of difficulty in swallowing. The client has recurrent cough. The client was under Ryle's tube for past one month. The client was also a known case of Bipolar mood disorder and was undergoing treatment since 20 years; he was a known case of vestibular schwannoma (right); the client had undergone Right Retromastoid Craniotomy and total excision of lesion was done on 6/2/2017 at Neurosurgical centre. The client had history of diabetes since 4 years and was under medications. Videolaryngoscopy was done and reveals Right vocal fold palsy. The client had developed symptoms of Right Lower Cranial Nerve Paresis with right vocal fold palsy.

Pre-morbid Status

The client had history of gait problem and double vision. And he had hearing loss since 10 years. The client's language and cognitive skills were intact.

Post morbid Status:

The client had unsteady gait. He had difficulty to swallow (under

Ryle's tube), the client is oriented but sluggish with decreased alertness and his range of motion is slow.

Cranial Nerve Examination:

Cranial Nerve	Findings
Trigeminal nerve	Facial anesthesia Loss of temperature/pain sensation Loss of sensation (anterior 2/3 of tongue) No weakness, asymmetry, tremors or fasciculations in jaw Weakness in jaw lateralization and closure is noted Decreased hyolaryngeal excursion
Facial nerve	Reduced facial expression of eyes. Drooping of eyes : present Not able to maintain intra oral pressure. Poor labial retraction and pursing Poor lip seal Ipsilateral upper and lower face weakness Reduced hyoid elevation Dry mouth, loss of lacrimation/ Diminished jaw opening/closing Loss of taste (anterior 2/3 of tongue)
Vagus nerve	Gag reflex: present Breathy voice quality Inability to vary pitch Difficulty swallowing (dysphagia) Impaired laryngeal closure Impaired true vocal cord adduction Right vocal fold paralysis
Accessory nerve	Adequate
Hypoglossal nerve	No fasciculation or tremors were observed. Reduced tongue protrusion

Cognitive and Language Profile:

The client was able to follow one-step command. He understand most of the conversation; also conversation repair is present and is able to follow communication strategies.
Spontaneous speech: Reduced

Cerebellar Testing:

Finger to nose test: Present (sluggish).
Pronator drift test: Negative.

Unsteady gait: Present.
Range of motion: Slow.

Oral Peripheral Mechanism Examination

ARTICULATOR	STRUCTURE	FUNCTION
Face	Eye drooping: : Present Eyelid closure: Present (partially) Abnormal movements (grimaces, spasms, etc) - Absent Drooling: Absent Mouth breathing- Present	Deviation to anyone side Rising of eyebrows- Left side: Present. Right side : Restricted
Lips	Deviation: Towards right side Lip closure: Absent. Symmetrical/ Asymmetrical	Retraction:- Absent Puckering: - Absent. Rounding:- Absent Pursing: - Absent. Lateral movements: - Present. Lip strength against resistance: Inadequate
Teeth	Normal Missing teeth Alignment:- Normal	
Tongue	Normal	Elevation: Affected Retraction: Present Protrusion: Present Lateral movements: Present Range of motion: Slow
Soft Palate	Normal	Movement (elevation / depression): Present.
Jaw	Normal	Opening / Closing: Present. Lateral Movements: Present (limited) Chewing Deviation towards Left side

Vegetative Skills

Sucking, Chewing, Drooling, Blowing and Biting : Restricted

Swallowing Profile

The following clinical symptoms of dysphagia were observed while providing different consistency of food,

- Delay in swallow and multiple swallow: Present
- Reduced laryngeal elevation
- Cough during swallow
- Gurgly voice: Present
- Aspiration: Present
- Recurrent cough was observed to be present.
- Pooling of saliva: Present

Voice profile:

Voice quality: Hoarse voice (Predominantly Breathy)

Pitch glide: Could not be done

Loudness range/MPD : The client variation in loudness is restricted due to Ryles tube).

Pharyngeal stage deficits such as reduced pharyngeal constriction, reduced laryngeal elevation, and poor airway protection are more related to impact on the glossopharyngeal and vagus nerves. Such deficits pose greater concerns for swallowing safety because of the potential for aspiration risk. In addition to the motor function of the nerves, sensory functions may also be affected, thus increasing the potential for silent swallowing dysfunction. This suggests the importance of formal, instrumental evaluation of swallowing functions.

OBJECTIVE EVALUATION

FEES (Fibro optic Endoscopic Evaluation of Swallowing) was done and revealed to have Penetration and Aspiration with the semisolid food contrasts. Pooling was present at Bilateral Pyriform Fossa.

QNST (Quick Neurological Screening Test) was done and found to have appropriate eye tracking; finger to nose test was present (Slow in range of motion); left right discrimination and figure recognition and production: present (Slow)

Subjective evaluation was done using DHI (Dysphagia Handicap Index): Functional and physical domain had severe impact and emotional aspects were found to be moderate impact in the clients overall Quality of life

Feeding- clinical observation

Riley's tube feeding: 8 times per day (protein diet)

2 hours once/ meal

Posture: Inclined position.

Time Taken to Swallow: per feeding: 10minutes

Clinical Impression

The client had undergone post operative excision of vestibular schwannoma in right side. [Retro mastoid craniotomy (Right)]; noted to have Right Lower Cranial Nerve Paresis symptoms with Right vocal cord palsy. Clinically, the client was diagnosed to have Oro pharyngeal Dysphagia.

Although a clinical evaluation can provide important information about swallowing, inherent limitations exist, leading to an inability to visualize the bolus or account for sensory deficits. The VFSS is a valuable tool for identifying specific anatomic and physiologic alterations in the oral and pharyngeal swallowing system (Logemann JA , 1988) .Of equal importance, it allows for implementation of compensatory techniques and the real-time assessment of their impact on swallowing safety and efficiency (Martin-Harris B, et.al, 2000)

Management strategies

Swallow therapy aims at improving the speed, strength, and range of movement of muscles involved in the swallow response and at modifying the mechanics of swallow to improve bolus transfer and avoid or minimize aspiration.

Supraglottic and Super Supraglottic Swallow. its aim is to close the vocal folds before and during deglutition in order to protect the airway from aspiration. The supraglottic swallow requires a breath-hold with no extra effort. It is useful in patients with penetrations or aspirations during the pharyngeal stage or slow pharyngeal motor pattern

Effortful or Hard Swallow. Its aim is to increase the posterior motion of the tongue base during deglutition in order to improve bolus propulsion. It is useful in patients with low bolus propulsion.

Double Deglutition. Its aim is to minimize postswallow residue before a new inspiration. It is useful in patients with postswallow residue (Logemann JA, 1995)

Postural adjustments such as a head turn, head tilt, or chin tuck may allow for control of the bolus on the intact side in cases of asymmetric dysfunction, thus improving bolus clearance and reducing the potential for laryngeal penetration and aspiration (Logemann JA, 1999). Postural strategies are simple techniques designed to alter the bolus flow. A chin down posture improves base of tongue contact to the posterior pharyngeal wall, opens the vallecular space, and puts the larynx in a more protected position. Head rotation to the damaged side closes off a weakened pharynx and allows bolus passage down the intact contralateral side (Shanahan TK, Logemann JA, Rademaker AW, et al., 1993)

Combinations of these strategies can be used with an additive effect.

The following are the facilitative strategies that had been carried out for past one month,

1. Chin down and head rotation towards damaged side.
2. Facilitation of proper tongue and lip strength and lip seal with visual and tactile feedback and sustain it for 10 - 15 seconds with 80% accuracy within 5-6 sessions of therapy.
3. Maintenance of intra oral breath pressure as a prerequisite skill for dry swallow by holding breath and tighten lip closure.

Range of motion exercises for the jaw, lips, oral tongue, tongue base, upper airway closure, and laryngeal elevation are useful. Resistance exercises are used for strengthening musculature. Exercises can be enhanced with new technology and devices.

4. Strengthening the base of tongue and to facilitate adequate tongue movement. Thus the tongue-holding maneuver improves the tongue base to posterior pharyngeal wall contact and exercises the glossopharyngeal muscle (Fujiu M, Logemann JA, 1996) . Dry or repeated swallows reduce pharyngeal residues. Tongue against resistance and tongue rotation; Tongue elevation and Tongue protrusion were also implemented for 8 sessions.

Sensory procedures provide altered sensory feedback or sensory enhancement during swallowing. Alterations in bolus volume, taste, and temperature can be used to affect changes in swallowing physiology. For example, cold and added pressure (thermal-tactile stimulation)

have been shown to increase the speed of initiation of the swallow response (Lazarra GDL, Lazarus C, Logemann JA, 1986). The aim of these strategies is the initiation or acceleration of the oropharyngeal swallow response. Most sensorial enhancement strategies include a mechanical stimulation of the tongue, bolus modifications (volume, temperature, and taste), or a mechanical stimulation of the pharyngeal pillars. Acid flavors such as lemon or lime [Hamdy, S, (1995), Logemann, JA (2003)], and cold substances such as ice cream or ice. (Rosenbek J. C. et al, 1996), trigger the mechanism of deglutition, but may not reach clinical or statistical significance even after intense training.

5. Clinician worked on improving the client's sensory feedback and enhancement procedures by providing appropriate thermal and sensory stimulation with tactile feedback through placement of hot and cold liquids and sweet and salty liquid on smaller amounts on oral cavity.

*Very little amount of such liquid is being given as the client has aspiration issues.

5. Diet alterations and food presentation strategies also can be used therapeutically to improve efficiency and safety of swallowing. Thickening liquids may slow the rate of bolus flow through the pharynx for patients with a delayed swallow. Alternating solids and liquids can reduce pharyngeal stasis.

The above mentioned behavioural management strategies were implemented for 8 to 10 sessions. The clients' feeding skills improved and oral feeding was facilitated. Post 1 week Ryles tube were also removed. The clinician counselled regarding dietary modifications, postural management strategies for few more sessions and asked to follow up once in a month for review.

DISCUSSION:

Dysphagia and aspiration lead to malnutrition, potentially life-threatening pulmonary complications and impairment of QOL.

Other components of oropharyngeal dysphagia are drooling, delayed triggering of swallow reflex, retentions, pharyngeal regurgitation. Complications of surgery after post removal of vestibular schwannomas resulting in lower cranial nerve palsy and facial nerve dysfunction had also been reported at previous literature. But the impact of it and functions such as swallowing and speech were not very well documented. The client who had post removal of vestibular schwannoma resulting in dysphagia: assessment of their swallowing and speech functions were discussed. Management strategies that showed improvement in their swallowing functions and symptoms of lower cranial nerve palsy were also reduced with successive therapy (Tongue base exercises, sensory stimulation, postural adjustments, Manoeuvres and dietary modifications) outcomes were documented.

References

1. Brady A (2008). "Managing the patient with dysphagia". *Home Healthc Nurse*. 26 (1): 41-6.
2. Darrouzet, V, Martel, J, En'ee, V, B'eb'ear, J, and Gu'erin, J (2004), "Vestibular schwannoma surgery outcomes: our multidisciplinary experience in 400 cases over 17 years," *Laryngoscope*, 114:681-688.
3. deSwart BJ, Verheij JC, Beurskens CH. Problems with eating and drinking in patients with unilateral peripheral facial paralysis. *Dysphagia*. 2003;18:267-273.
4. Fujiu M, Logemann JA. Effect of a tongue holding maneuver on posterior pharyngeal wall movement during deglutition. *Am J Speech-Lang Pathol*. 1996;5:23-30.
5. Hamdy, S, Jilani, S, V, J. Price, C, Parker, N, Hall, and M. Power, "Modulation of human swallowing behaviour by thermal and chemical stimulation in health and after brain injury,"
6. *Neurogastroenterology and Motility*, vol. 15, no. 1, pp. 69-77, 2003.
7. Lanman, T, Brackmann, D. E, Hittselberger, W. E, and Subin, B (1999), "Report of 190 consecutive cases of large acoustic tumors (vestibular schwannoma) removed via the translabyrinthine approach," *Journal of Neurosurgery*, 90:617-623.
8. Lazarra GDL, Lazarus C, Logemann JA. Impact of thermal stimulation on the triggering of the swallow reflex. *Dysphagia*. 1986;1:73-77
9. 5.
10. Logemann JA. The role of the speech language pathologist in the management of dysphagia. *Otolaryngol Clin North Am*. 1988;21:783-788.
11. Logemann JA. Behavioral management for oropharyngeal dysphagia. *Folia Phoniatr Logop*. 1999;51:199-212.
12. Logemann JA, "Dysphagia: evaluation and treatment," *Folia Phoniatrica et Logopaedica*, 1995:47:140-164.
13. Logemann, JA, Pauloski B, R, Colangelo, L, Lazarus, C, Fujiu, M, and Kahrilas P, J, "Effects of a sour bolus on oropharyngeal swallowing measures in patients with neurogenic dysphagia," *Journal of Speech and Hearing Research*, 1995;38:556-563, 1995.
15. Martin-Harris B, Logemann JA, McMahon S, Schleicher M, Sandidge J. Clinical utility of the modified barium swallow. *Dysphagia*. 2000;15:136-141.
16. Rosenbek J, C, Robbins J, A, Roecker E, B, Coyle J, L and Wood J, L, "A penetration-aspiration scale," *Dysphagia*, 1996: 11:93-98.
17. Shanahan TK, Logemann JA, Rademaker AW, et al. Chin-down posture effect on aspiration in dysphagic patients. *Arch Phys Med Rehabil*. 1993;74:736-739.
18. Smithard DG, Smeeton NC, Wolfe CD (2007). "Long-term outcome after stroke: does dysphagia matter?," *Age Ageing*, 36 (1):90-4.
19. Wiet, Raslan, W, Kazan, R. P, and Herzon G. D (1986), "Complications in the approach to acoustic tumor surgery," *Annals of Otolaryngology and Rhinology*, 95