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Case Study

Swallowing Management in Self-Inflicted Cutthroat Injury and Longstanding Substance Abuse: A Case Study

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Abstract

Background: Suicide is the leading cause of death. Self-inflicted cutthroat injury although rare but is one of the ways for attempting suicide. The cutthroat injury lacerates the major blood artery, soft tissue, cartilage and nerve supply in the neck region. Additionally, substance abuse is found to reduce psychological and cognitive flexibility that induces suicidal tendencies.

Methods: The current case study presents the holistic management of voice and swallowing difficulties faced by a 25-year-old man with a cutthroat injury and a history of substance abuse.

Results: The client could manage foods of all consistencies without any difficulty. He also had shown improvement in voice quality, post-therapy.

Conclusion: The article highlights the recovery of impaired swallowing and voice function in the case of dual trauma caused by cut-throat injury and substance abuse.

Keywords: Cutthroat Injury; Suicide; Dysphagia; Swallowing Difficulty; Substance Abuse

Introduction

Suicides are reported to be the second-highest cause of mortality in adults [1]. Globally accounts for 8,00,000 deaths annually [2]. The self-inflicted cutthroat injury is one of the common ways to commit suicide. These injuries are described in terms of three zones given by Roon and Christensen [3], the zone 1 injuries are at the thoracic inlet level. This zone extends from the cricoid cartilage to the clavicles. In Zone II injuries, incision lies between the cricoid cartilage and the angle of the mandible. Zone III injuries occur between the angle of the mandible and the base of the skull. There are hesitation cuts observed in most of the self-inflicted cut-throat injuries [15]. The penetrating neck injuries are widely reported to cause air-way, pharyngo-oesophageal, vascular, and neurologic injuries [4]. Also, substance abuse is demonstrated to be related to suicidal tendencies. Substance abuse reduces psychological and cognitive flexibility [5,6] which increases the vulnerability for suicidal ideation [6]. The psychiatric abnormalities like depression, anxiety, bipolar disorder, conduct disorder, and attention-deficit/hyperactivity disorder are not an exception in a person with substance abuse [7].

Substance abuse is considered a health disorder with multifold abnormalities. It is reported to alter the psychological and psychiatric dimensions. It further affects the emotional, social, and economical state of the person [8]. Additionally, substance abuse cause asymmetry in the pharyngeal anatomy, affects the airway reflexes and causes voice disorders [9,10]. The study done by Chai, Sprecher, Zhang, Liang, Chen, and Jiang found significantly abnormal jitter in the voice of smokers [11]. As the anatomical structures in the pharyngo-oesophageal region are also vital for swallowing remarkable deficiency in the swallowing abilities is expected.

Dysphagia is an inability to transfer food safely in the esophagus. It is an outcome of complex coordination between the neuronal and muscular structures of the oral, pharyngeal, laryngeal cavity, and esophagus. The effective functioning of more than 30 nerves and muscles is important to accomplish a safe swallow [12]. Certain substances are known to alter the functioning of the central nervous system and affect normal swallowing abilities [13]. Substance abuse is reported to reduce the lower esophageal sphincter movement causing dysphagia [14]. The damage caused by substance abuse is multifold including neuronal abnormalities, anatomical

degeneration, and psychogenic disorder. Therefore, it warrants holistic management. Though substance abuse is known to cause dysphagia and voice disorders, very few studies have been documented in this aspect. Hence the need to report this case was felt.

Case Report

A 25 years old man reported to the Audiology and Speech Therapy department in January with a complaint of delayed cough during swallowing for the past six months. Detailed case history revealed, he had self-inflicted throat injury. He reported an increase in meal-time post-injury. The client also reported that he feared swallowing as it would cause discomfort while swallowing. During this period, he also reported weight loss. He had a history of substance abuse for the past 10 years and was under treatment for the psychiatric condition for the past three years, as reported by the caregiver; details for the same were not available. On further probing, the client reported that he was a college drop-out, had enforced family obligations and was jobless; this was mounting on the aggression and made him very intolerant. Additionally, the lack of motivation and aggression was sensed by the psychologist.

The caregiver reported that he was having a burst of anger and had inflicted his neck after a fight with the family members. The superficial incision was made with a sharp object in Zone II, stretching in the lateral aspect for 4 to 5 cm. He was hospitalized in his town in Lucknow for three months. The details about the swallowing status at that time are not available however he was kept on Ryle's tube. Three months after the incision was healed, the client removed Ryle's tube against medical guidance. After this, he had difficulty in swallowing food of all the consistencies but still, he refused to accept Ryle's tube. He had a globus sensation and delayed cough post swallow. He managed the food of different consistencies using multiple swallows and drinking sips of water to wash down the residue.

He reported to the tertiary care center in Mumbai, after six months, mainly for the management of blisters over the stitches on the neck. In the E.N.T department client was taken up for indirect laryngoscopy that revealed the presence of granular pharyngitis. Both vocal cords were mobile. He also had a complaint of change in the voice even before the incident. Furthermore, on the fiberoptic endoscopic evaluation of swallowing (FEES) evaluation, excessive pooling of saliva was observed with delayed penetration and aspiration of saliva on the dry swallow. Hence, Ryle's tube was placed a second time for attaining the safe swallow. The client was advised for a CT scan of the neck region by E.N.T, findings showed no significant abnormality in the nasopharynx, laryngeal area, hypopharynx, and the parotid and sub-mandibular parotid glands, except, asymmetry of the right pyriform fossae in the CT findings.

The client was referred to Audiology and Speech Therapy (AST) department post E.N.T evaluations. A detailed clinical evaluation was done at the AST department. The physical examination of the oral peripheral mechanism revealed normal functioning of all the oral structures. Different consistencies (regular solid chapatti; mechanically altered, boiled rice, pureed, mashed banana, regular liquid, water, nectar, juice, and thick liquid, honey) were used to observe the oral and pharyngeal phases of swallowing. He had no difficulty in attaining the adequate lip seal, maintaining lip closure, masticating, and transporting the bolus. The oral transit time (OTT) was found to be delayed for soft solids. The hyolaryngeal excursion was adequate. However, the delayed cough was observed post 5s of swallow, along with wet and gurgly voice and repeated throat clearing was observed. Additionally, facial grimacing, discomfort, and exaggerated neck elevation with shoulder stiffness were observed.

The speech intelligibility score was 1 where the listener can understand speech without difficulty. The voice was hoarse and had abnormally higher jitter and shimmer values. The perceptual rating GRBAS scale was $G_1R_1B_0A_1S_1$. Overall, the client's voice had an intermittent gurgly voice; functions of respiration and resonance were adequate. The client resorts to hard glottal attacks and throat clearing to correct the wet voice. During the evaluations high muscle tension and stiffness were observed in the posture. Client also had a complaint of burning sensation in the chest owing to acidity. Reflux Symptom Index (RSI) score was 15 which indicates significant Gastro-Esophageal Reflux Disorder (GERD). The hearing assessment was carried out using pure tone audiometry in standard conditions to rule out hearing loss, which revealed normal hearing sensitivity in both ears.

With the findings of the above evaluations, the impression of oropharyngeal dysphagia with hoarse voice was drawn. The swallowing and speech rehabilitation was carried out for 10 sessions (45 min duration) using Hybrid therapy techniques (face-to-face and online modalities). Breathing and relaxation exercises were given to reduce the overall stiffness and to maintain appropriate posture. The vocal relaxation exercise and vocal hygiene program were given to maintain optimal vocal health. To improve the client's swallowing ability, direct (range of motion exercises, supra-glottic swallow, multiple swallows) and compensatory techniques (diet and consistency alterations) were employed. The client was counselled about the hazards of substance abuse and silent aspiration as in his case. He was also encouraged to help his brother in his business as the client didn't want to take up any other independent responsibility.

Results and Discussion

At the end of 10 sessions re-evaluation was done at the AST department. It revealed that the client was now able to resort to an oral diet of all consistencies without any modification inconsistency. He had pulled out the Ryle's tube for the second time without medical advice within two weeks of starting swallowing therapy. The client was referred back to the E.N.T department to rule out the presence of silent aspirations. Although the delayed cough was seen occasionally, F.E.E.S. revealed done again in March revealed no silent aspiration. For the safe swallow measures, he was advised to take a small bolus at a smaller rate. Furthermore, the voice perceptually had shown improvement in terms of reduced hoarseness and wet and gurgly voice. The perceptual rating was $G_1R_0B_0A_0S_1$. The jitter and shimmer values had reduced as compared to pre-evaluation findings, however, they are slightly higher than the normative values for his age and gender. There was a remarkable improvement in the quality of voice with traditional vocal relaxation exercises. The vocal hygiene program was followed by the client regularly. Throat clearing and coughing behaviors had reduced. The RSI score was 9, suggestive of reduced reflux. The client reported he had relief from GERD after taking medication and following good vocal hygiene.

The presence of psychiatric disorder in substance abuse is as per the study by Luoma, Drake [5] and Miranda, Valderrama [6]. They have demonstrated that reduced cognitive flexibility increases suicidal ideations. As reported by the client he used to smoke cannabis, cigarette and take alcohol for the past ten years which was suspected to cause alteration of the airway reflexes and airway anatomy [10]. It was reported by Jiries Meehan-Atrash, Korzun [10] that cannabis smoking adversely affects the voice and respiratory system. In the present case, long-term substance abuse was suspected to alter the cognitive flexibility leading to suicidal ideation. Additionally, swallowing and voice disorder was the secondary outcome of substance abuse. The difficulty in swallow was attributed more to changes in the anatomy due to heavy substance abuse of more than 10 years. As extubation trauma was found to cause dysphagia post prolonged intubation (> 48 hrs), this can also be one of the factors worsening the ability to swallow safely [13].

The presence of voice disorder in the present case can be attributed to cannabis smoking. Similar findings were reported by King., *et al* [16]. Several studies have found substance abuse, psychiatric disorders, unemployment, and poverty as the root cause behind suicidal attempts [17-19]. Out of these, three major factors- substance abuse, bursts of anger, and unemployment were reported in our case. To address the hazardous outcome of substance abuse, the client was referred to a psychiatrist and psychologist.

Conclusion

The article highlights the recovery of impaired swallowing and voice function in the case of dual trauma caused by cutthroat injury and substance abuse.

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Conflict of Interest

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Ethical Approval

Not applicable.

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