

Multidisciplinary Orofacial Therapy after Suicidal Treatment: Casuistical Report

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Received September 23, 2007; Accepted November 12, 2007.

Key words: Swallow – Oral stimulus – Palatal augmentation prosthesis

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Abstract: Cutting wounds and bruises in the area of neck are very specific. The overall rehabilitation of these conditions is difficult and often needs to be combined with special and customised orofacial prostheses. This case-study reports special multidisciplinary treatment. The surgical diagnosis was: a cutting wound on a neck caused by a chain saw and disruption of oropharynx. Due to contusion of the tongue root and contusion of both hypoglossal nerves, a complete paralysis of tongue occurred. The tongue was immobile and the patient has problems with swallowing fluids. A special palatal prosthesis was made to reduce the space between the tongue and the palate. The fluoroscopically monitored swallowing action helps to receive optimal patient's rehabilitation.

Introduction

Failed suicidal attempts or oral cancer in the orofacial area often result in significant destruction of hard and soft tissues [1, 2]. There are accounts of shot wounds where a patient put the rifle-barrel of a long firearm under the chin and due to its rebound, the direction of the shot changed and the result was devastation of the face. Cutting wounds and bruises in the area of neck are very specific. Such failed attempts often result in disorders of breathing and swallowing, often accompanied with speech impediments [3, 4]. The overall rehabilitation of these conditions is difficult and often needs to be combined with special and customised orofacial prostheses. The result of the treatment is always a compromise [5, 6]. In the following case-study communication, we want to document this special treatment.

Case Study Communication

At the telephonic request of an attending logopedist, a 32-year-old patient who had attempted to commit suicide out of unhappy love by using a chainsaw in response to a break-up with his wife, was referred to my practice. It was his second suicidal attempt. The first failed suicidal attempt, in which he tried to hang himself, ended with a fall from the tree because the rope was not enough strong to hold the patient; as a result of the fall, he broke his calcaneus; open repositioning of the fracture of the calcaneus and osteosynthesis were carried out. Until this second suicidal attempt, our man had to use crutches when walking.

In the second attempt, he caused himself a horizontal lacerated contused wound on his neck, approximately 1 to 2 cm away caudally from the bottom edge of mandible. The lacerated contused wound was approximately 24 cm long and extended from the angle of bottom jaw on the right to the contralateral angle; another wound on the right only cut the skin and hypodermis in the length of around 6 cm, laterally from thyroid cartilage, parallel to the large submandibular wound (Figure 1). As a result of this

self-mutilation, both submandibular salivary glands were severely torn and the suprahyoid muscles were also broken (Figure 2). Pharynx was cut approximately 1 cm orally above epiglottis under the tongue root on 1' of the perimeter; only its prevertebral part remained intact. Carotids and jugular veins were not disrupted. N. vagus on the left was cut in colpos; both nervi hypoglossi were cut. There were pieces of wood in the wound after the previous use of the saw for cutting wood.

The surgery report from the Third Surgery Clinic states: The surgical diagnosis was as follows: a cutting wound on a neck caused by a chainsaw and disruption of oropharynx. Suture of oropharynx, tracheotomy, gastrostomy, extirpation of submandibular salivary glands on the right and on the left, excision of devitalised tissues and suture of neck wounds were carried out. As the next step, suture of oropharynx and suprahyoid muscles was carried out. The necrotic tissue in the submandibular area was also excised. Tracheostomy was carried out. Gastrostomy was carried out to ensure nutrition.

The translated report for the Bohnice Mental Hospital states the following, among other things: Due to contusion of the tongue root and contusion of both hypoglossal nerves, a complete paralysis of tongue occurred. The tongue is immobile and the patient has problems with swallowing fluids. Due to contusion, it

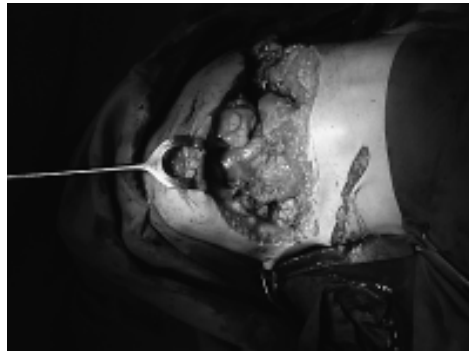


Figure 1 – Overall view of the lacerated contused wound in the submandibular area when the patient was admitted to the 3rd Clinic of Surgery.

Figure 2 – A close-up of the submandibular area when pulled open by a hook.

Figure 3 – A view on the patient's neck after the wound healed.

was not possible to carry out reconstruction of nn. hypoglossi; as a result, the tongue moderately atrophied and its function cannot be improved. View of the area of patient's neck after removal of gastrostomy and after the wounds caused by the trauma healed (Figure 3).

The therapy also included logopedic care, which was primarily focused on improving the swallowing function and subsequently on dysarthric speech impediment. With the assistance of the logopedist, who participated in the rehabilitation of swallowing, a radiologist examined the individual phases of the swallowing action. After administration of fluid contrast medium, there was a minor elevation during videofluoroscopy, while the transport of the fluid towards pharynx was inhibited even when the head was flung back. The patient was unable to hold a mouthful of the fluid contrast medium between his palate and tongue and consequently a small amount of the contrast medium passively leaked into pharynx. This small bolus did not initiate the pharyngeal phase of swallowing. The contrast medium subsequently leaked as far as into valleculae and got into larynx along the rear plane of untilted epiglottis (Figure 4).



Figure 4 – Videofluorographic study of the oropharyngeal region 3 month after operation shows patients inability to keep bolus of liquid contrast material between hard palate and the tongue. Liquid contrast material is falling into lateral and anterior sulcus and small amount of contrast material is slowly passing the base of tongue by gravity into the valleculae, entering the airways entrance. The pharyngeal swallow does not trigger.

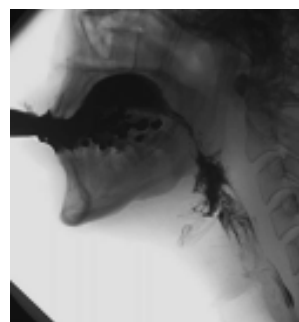


Figure 5 – Lateral fluorogram before application of the augmentation prosthesis. a) Lateral videofluorogram illustrating the reduced tongue elevation with incomplete tongue to palate contact; b) Range of anterior to posterior tongue propulsion appears considerably inefficient with slowed oral transit time up to 10 sec.; c) Reduced tongue elevation leads to persisted collection of contrast material between hard palate and tongue. Triggering the pharyngeal phase occurs as bolus of contrast head reaches anterior faucial arches.

Only after the patient succeeded in moving a larger bolus of the contrast medium into the area of faucial arches was the pharyngeal phase of swallowing activated. Due to the poor elevation and retraction of the tongue root, as well as partly due to the moderate hypotonia of pharynx, large residues of the contrast medium remained in valleculae and piriform recesses. Also, moderate insufficiency of velopharyngeal sphincter was identified and lower elevation of larynx during the swallowing process was identified. During the examination, regurgitation into nasopharynx or aspiration or penetration into air passages did not occur. The patient was completely unable to swallow thickened contrast medium; the administered bolus remained in buccal recesses (Figures 5 a, b, c). When receiving normal daily thicker food, the patient flung back his head and used his finger to move the food back into the pharyngeal entrance.

Based on this examination, the logopedist specialising in swallowing disorders, concentrated primarily on improving the residual functions of the tongue during rehabilitation. The goal was to stimulate elevation and the propulsive forward and backward movement of the tongue by using various techniques as well as to improve the function of the velopharyngeal sphincter and to strengthen suprahyoid muscles. After this rehabilitation, the patient started to receive fluids in a better way and partly even received mixed diet. According to a fluoroscopic examination, significantly lower quantity of residues remained in the pharynx after swallow. However, problems with a thicker diet persisted. Mere rehabilitation regrettably did not succeed in creating full contact between the tongue and the palate, which is necessary for this type of food.

We decided to solve this problem by using prosthesis. We made a special palatal prosthesis, which reduced the space between the tongue and the palate. We refer to such prostheses as to “palatal augmentation removable prostheses”. They are composed of palatal resin basic material and of various types of

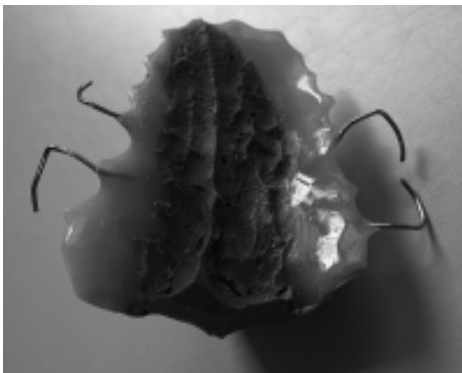


Figure 6 – Palatal prosthesis with an applied layer of the polyether imprinting matter during the external rebasing process.



Figure 7 – The view of the patient's upper jaw with the augmentation prosthesis.

retention elements, most frequently clasps. This contact is important for normal deglutition and speech. In this case (gothic palate) we filled this space by removable partial desk to recessive linguopalatal contact. This prosthesis consists of removable partial desk and retentive clasps; the prosthesis is fabricated in a standard manner using heat curing acrylic resin. The thickness of this desk is correlated with special external rebasing. We put on this desk polyether impression material and the patient tried to swallow a liquid with radio-opacity. We repeated it, as the patient and dentist subjectively agreed to the most efficient contours desk for swallowing. After the rebasing of contours was completed, the impression material was detached and the augmentation desk received a new design, again with heat-curing acrylic resin. According to the morphology of the swallowing action, the prosthesis was gradually being shaped by the polyether impression material (Figure 6), which was subsequently replaced, through external rebasing, by a methyl-metacrylate resin, setting through a chemical reaction, in a laboratory. Swallowing was evaluated with oral transit times. Augmentation prosthesis allowed reduction of oral transit times from 10 to 3 seconds on bolus flow, measured from videofluoroscopy.

After the patient practiced the swallowing action, we have twice made additions to the augmentation prosthesis basis according to the fluoroscopically monitored swallowing actions. After modifications, we have put the prosthesis, created in this way, into the patient's mouth (Figure 7).

The result was the improvement in the swallowing action. We achieved a condition, in which the patient was able to swallow mouthfuls of thicker consistence thanks to the improved elevation of the tongue and its movement in forward and backward directions. This augmentation prosthesis allowed reduction

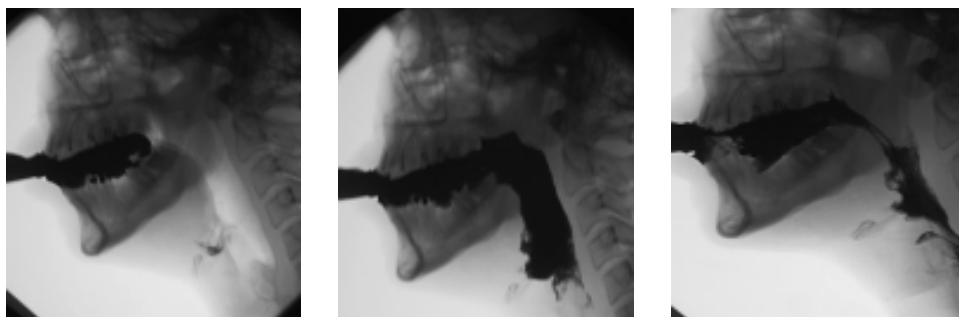


Figure 8 – A lateral fluorogram with the augmentation prosthesis applied. a) Postprosthesis lateral videofluorogram shows palatal reshaping prosthesis recontours the hard palate to interact with the tongue; b) Filling in the areas of the hard palate with the prosthesis appears less spacious with better contact of patient's tongue enabling patient to control and propel the bolus of contrast material more effectively. Oral transit time was reduced from previous 10 sec. to 3 sec.; c) Small residue of contrast material in the lateral sulcus of oral cavity. No delayed pharyngeal phase and no signs of penetration contrast material to airways entrance.

of oral transit times of bolus flow and made swallowing of hard bolus possible. By comparing the fluorograms before and after the application of the augmentation prosthesis, it is possible to document improvement in the contact between the tongue and the palate and improvement of the entire pharyngeal phase of the swallowing action without any risk of aspiration (Figures 8 a, b, c). The patient use this augmentation prosthesis 2 years and he is satisfied .The prosthesis allows the patient to swallow a hard bolus. Without prosthesis the swallowing of hard bolus is still impossible.

Discussion and Conclusion

The palatal augmentation prosthesis has been defined by the Glossary of Prosthodontic Terms as a palatal prosthesis that allows reshaping of the hard palate to improve tongue/palate contact during speech and swallowing because of impaired tongue mobility as a result of surgery, trauma, or neurologic/motor deficits¹. The movement of the soft palate is coordinated activity that results in varying degrees of closure between the soft palate and the pharyngeal walls during breathing, speaking, and swallowing. When using the palatal augmentation prosthesis, the palatal vault is re-established at a lower level than normal, requiring less bulk and mobility of the tongue for appropriate palatolingual contacts during speech and swallowing. The purpose of this prosthesis is the restoration of function. It is incapable of replacing the tongue [4]. Remaining natural teeth, residual ridges, endosseous implants, hard palate, and residual soft palate will all contribute, positively or negatively, to the support, retention, and stability of the prosthesis [7]. Our case study documents the results of interdisciplinary work at an unusual clinical case. Our patient was fully satisfied after the prosthodontic treatment and did not request any further treatment.

References

1. LOGERMANN J. A., KAHRILAS P. J., HURST P., DAVIS J., KRUGLER C. H.: Effect of intraoral prosthetics on swallowing in patients with oral cancer. *Dysphagia* 10: 32–35, 1995.
2. SOPER N. J., DUNNEGAN D.: Anatomic Fundoplication failure after laparoscopic antireflux surgery. *Surgery* 229: 669–686, 1999.
3. SHIMODAIRA K., YOSHIDA H., YUSA H., KANAZAWA T.: Palatal augmentation prosthesis with alternative palatal vaults for speech and swallowing: A clinical report. *J. Prosthet. Dent.* 80: 1–3, 1998.
4. MARUNICK M., TSELIOS N.: The efficacy of palatal augmentation prostheses for speech and swallowing in patients undergoing glossectomy: A review of the literature. *J. Prosthet. Dent.* 91: 67–74, 2004.
5. CARRAU R. L., MURRY T.: Comprehensive management of swallowing disorders. Singular Publishing Group, Inc., San Diego, 1999, 249–253.
6. LOGEMANN J. A.: Evaluation and treatment of swallowing disorders. PRO-ED, Inc., Austin, 1998, 203–230.
7. TAYLOR T. D.: Clinical maxillofacial prosthetics, Quintessence Publishing Co, Inc, 2000, 121–131.