

EARLY COMPREHENSIVE REHABILITATION OF PATIENT WITH POSTOPERATIVE DYSPHAGIA

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Postoperative paresis and paralysis of the larynx, associated with breathing, voice and swallowing disorders, are actual problem of surgical treatment of the thyroid and mediastinal diseases. Traditionally, more attention is paid to phonation disorders treatment. Swallowing recovery methods are not described sufficiently. The paper reports a clinical case of early speech therapy intervention aimed at alleviating postoperative dysphagia caused by the limited flexibility of the larynx. Detailed swallowing disorder diagnosis in patient was carried out before and after the logopaedic correction of dysphagia. The main directions and results of the correctional and pedagogical work with psychological support within comprehensive rehabilitation are described. The findings confirm the need for correctional impact during the early stages of rehabilitation in case of dysphagia in surgical patients with the paresis or paralysis of the larynx.

Keywords: paresis and paralysis of the larynx, dysphagia, logopaedic impact, early rehabilitation, psychological support

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РАННЯЯ КОМПЛЕКСНАЯ РЕАБИЛИТАЦИЯ ПАЦИЕНТА С ПОСТОПЕРАЦИОННОЙ ДИСФАГИЕЙ

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Хирургическое лечение заболеваний щитовидной железы и органов средостения может привести к послеоперационным парезам и параличам гортани, сопровождающимся расстройствами функций дыхания, голоса и глотания. Традиционно большое внимание уделяется коррекции нарушений фонации. Методы нормализации глотания описаны недостаточно. В статье представлен клинический случай раннего логопедического воздействия в целях нивелирования послеоперационной дисфагии, обусловленной ограничением подвижности гортани. Проведена подробная диагностика расстройства глотания у пациентки до начала логопедической коррекции дисфагии и по ее завершении. Описаны основные направления и результаты коррекционно-педагогической работы с психологическим сопровождением в рамках комплексной реабилитации. Полученные результаты подтверждают необходимость коррекционного воздействия на ранних этапах реабилитации в случае возникновения дисфагии при парезах и параличах гортани у пациентов хирургического профиля.

Ключевые слова: парезы и параличи гортани, дисфагия, логопедическое воздействие, ранняя реабилитация, психологическое сопровождение

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Paresis and paralysis of the larynx caused by recurrent laryngeal nerve impairment are among the most common complications of the thyroid, parathyroid, and thoracic surgery [1, 2]. Successful surgery does not always have the expected functional result and sometimes leads to postoperative complications associated with the breathing and voice function disorders, thus leading to communication difficulties and reduced working capacity. Phonatory and breathing

disorders persist for a long time and become a problem during comprehensive rehabilitation measures aimed at resocialization and improving the quality of life [3, 4].

The larynx not only enables breathing and voice functions, but is also involved in swallowing. According to our observations, there are specific swallowing disorders in postoperative period. In the literature, when discussing clinical picture of the peripheral neurogenic laryngeal paresis and

paralysis, the authors focus on the breathing and voice function disorders; when correcting functional disorders no attention is paid to leveling of specific swallowing disorders, caused by the limited flexibility of the larynx. The majority of well-known effective methods for elimination of swallowing disorders have been proposed by foreign and domestic experts to improve meal process in patients with acute cerebrovascular disease, traumatic brain injury and brain tumors [3, 5–7].

The methods of sequential rehabilitation could not be considered reasonable in cases of vital function disorders. The risk of food and liquid aspiration in airways developing within a few hours after surgery calls for early rehabilitation impact. Traditionally, speech pathologists are responsible for correctional measures for elimination of swallowing disorders [8–10]. Specific manifestations of the peripheral neurogenic swallowing disorders in surgical patients, including cancer patients, present certain difficulties for specialists and demand specific approaches to rehabilitation. Malignant tumor diagnosis limits in application of a number of methods for overcoming dysphagia (logopaedic massage, hardware techniques stimulation), widely used in the rehabilitation system for patients with cerebrovascular disease and post-stroke patients [6, 7].

According to the Ministry of Health of the Russian Federation regulations, rehabilitation process should be carried out by the interdisciplinary rehabilitation team in accordance with the clinical guidelines. It is recommended to carry out the first stage of rehabilitation in the structural units of medical organization, including the oncology profile. There will be specialists of the psychological and pedagogical field (a speech pathologist/medical speech pathologist and a psychologist/medical psychologist) as a link of the team necessary for achieving the most possible effect of rehabilitation [11].

The study was aimed to discuss the clinical case in order to identify the features of the swallowing disorder manifestation and to find effective ways for early rehabilitation of swallowing function in patients with postoperative dysphagia, provide a personalized early rehabilitation program for patients with swallowing disorders after the surgical treatment of the head and neck tumors within interdisciplinary interaction [12], and the optimal and effective logopaedic techniques for the postoperative swallowing disorders leveling, taking into account the features of the underlying disease.

Clinical case

A patient K-ko GS was under our observation after readmission for surgical treatment after thyroidectomy due to thyroid cancer (T1N1M0).

Preoperative indirect laryngoscopy showed that all parts of the larynx were well defined, vocal folds were even, mobility was fully preserved. Voice and speech respiration were normal. No meal disorders were noted.

The patient was interviewed before surgery in order to initiate contact, provide psychological support, form motivation for rehabilitation, and provide information about the mechanisms underlying voice production and speech respiration. The patient was informed about the main principles of speech respiration as physiological function and trained in basic diaphragmatic breathing skills.

The surgical procedure included the right-sided fascial compartment neck excision, anterior neck lymph node dissection. During the postoperative period, the patient complained about discomfort in the operated area and the larynx, impaired voice and speech respiration, trouble

in swallowing liquids (cough and choking). The right-sided laryngeal paresis was diagnosed by indirect laryngoscopy.

To assess the swallowing disorder severity, the condition of oral cavity and dentition along with difficulties when chewing and swallowing liquid or solid food, and preferred food textures were defined through a questionnaire; the feeling of having food stuck in the throat, pain when mealing were recorded. Special attention was paid to emotions associated with meals, as well as to body weight changes. When filling out the questionnaire for subjective assessment of swallowing problems, the woman noted trouble in swallowing liquids (tea, coffee, water, juice), that she identified as very threatening.

Psychological support included the meaning-narrative analysis of interviews with the patient within the meaning-activity approach during the rehabilitation course and was focused on assessing her psychological condition dynamics at various stages of speech therapy [13]. It was found that such categories as anxiety, fear, worry, introversion, and difficulty of interacting with the specialists prevailed at the stage of diagnosis. Motivational combination included evenly the achieving tendency and failure tendency, the affiliative tendency and sensitivity to rejection, that created difficulties in forming motivation for rehabilitation.

To clarify the character and severity of swallowing disorders in the early postoperative period (on day 2), speech pathology assessment was performed, which included assessing respiration and phonatory breathing, maximum vowel phonation time (MPT), and auditory assessment of voice using the Union of the European Phoniaticians (UEP) scale [3]. When performing auditory evaluation, opinions of three auditors among the members of the interdisciplinary rehabilitation team were taken into account. In the reported case, auditory voice evaluation was assigned UEP score 3 (moderate dysphonia), and MPT was 5.3 s.

Preliminary assessment of the swallowing disorders was carried out using the 3-sip test (the patient was asked to take three sips of water from a spoon. After the patient coped with the task, she was asked to drink half a glass of water; at this stage choking was detected, the patient started to cough). Furthermore, endoscopist, in the presence of operating surgeon and speech pathologist, performed videolaryngoscopy with the real-time swallowing evaluation using the Patent Blue V Food Color (Zeelandia; Netherlands), water and the Resource ThickenUp Clear thickening agent (Nestle; Switzerland). Swallowing was assessed by sequential swallowing of three different liquid consistencies with subsequent assessment of the larynx condition with patented method [14].

Videolaryngoscopy with swallowing evaluation showed that epiglottis was symmetrically arranged and mobile. The right half of the larynx had limited flexibility. The vocal fold was in paramedian position. The glottis was sufficient for respiration, a linear slot under 2 mm persisted during phonation. Subglottic space and pyriform sinuses were free. When swallowing liquid, all components of the larynx up to and including the vocal folds were stained with the contrast agent; the dye solution entered the lower respiratory tract reaching the infraglottic space, caused cough, which was considered as aspiration into the airways with an adequate protection reflex. The dye test was positive.

Conclusion: right-sided laryngeal paresis. Moderate pharyngeal dysphagia.

Exercises for further speech rehabilitation were chosen based on the laryngoscopic condition and the swallowing process condition [4, 10].

On day 3 after surgery, the speech therapy course with psychological support was started. The main tasks were to

increase pharyngeal muscle activity and the pharynx–larynx interaction recovery in the swallowing process.

The patient was recommended to continue practicing breathing exercises in order to recover phonatory expiration and develop physiological respiration, she was also recommended to do the Effortful Swallow exercise (three repetitions up to 10 times a day) [15].

To alleviate physical and psychological discomfort during meals, the patient was provided advice on nutrition based on the character and severity of the swallowing disorders (posture: the Chin Thuck maneuver), food consistencies (thickening liquids to a thick syrup) [4].

It is worth mentioning that the need for intense activity in the postoperative period had a positive influence on the patient's emotional sphere, that facilitated specific meaning work in the new non-everyday life situation. It is important to emphasize postoperative asthenia, which could worsen as dysphagia became more severe, among features of conducting speech therapy during the early postoperative period. This fact required training in a sparing mode, in a fractional manner, with the progressively increasing load and training session duration, as well as the increasing complexity of the proposed material when changing the stages of the rehabilitation impact.

In a week the patient was able to do breathing exercises, that made it possible to move to the stage of active training using the methods of “direct” therapy (exercises on strengthening pharyngeal muscles, muscles of the soft palate and larynx). The methods of “indirect” therapy were also used: functional training using small amounts of food or liquid. The patient continued repeating the Effortful Swallow exercise with increasing load (5 repetitions 10–12 times a day).

After 14 days further improvements were noted: the number of choking episodes during meals decreased, the voice sonority and phonatory expiration time increased. It was recommended to keep the diet and increase the number of repetitions of the Effortful Swallow exercise to 7 times per session. After 21 days, the stage of the “safe” swallowing skill automatization started: exercises for practicing vowel sounds and their combinations, as well as for differentiation of the swallowing, respiration and phonation processes.

Clinical case discussion

After the four-week course of speech therapy, videolaryngoscopy with swallowing evaluation was performed again [14]. It showed that epiglottis was symmetrically arranged and mobile. The right half of the larynx had limited flexibility. The vocal fold was in paramedian position. The glottis was sufficient for respiration; the tendency for vocal fold closing on the injured side due to

the increased activity of the left vocal fold was observed during phonation. Subglottic space and pyriform sinuses were free. When swallowing liquids of three proposed consistencies, all components of the larynx up to and including the vocal folds showed no signs of staining. No aspiration in airways was revealed. The dye test was negative.

Conclusion: right-sided postoperative laryngeal paresis. No dysphagia.

When re-filling in the questionnaire, the patient denied difficulties when drinking liquids and had no feeling of having food stuck in the throat when swallowing. She noted that she could take meals of any consistencies and experienced no negative emotions when drinking liquids. Speech therapy sessions aimed at improving phonatory expiration and acoustic characteristics of voice were resumed during the final stages of rehabilitation and had a positive effect [3].

Thus, speech therapy sessions, which were conducted from early postoperative period within the comprehensive rehabilitation program, aimed not only at phonatory respiration and voice. Logopaedic impact started with adaptation to the new conditions of taking liquids and elimination of dysphagia on day 3 after surgery. The measures for dysphagia correction during the early postoperative period had a positive influence on the rehabilitation effectiveness and smoothed out the meal difficulties in a short time. Immediate alleviation of swallowing disorders made it possible to reduce significantly physical and psychological discomfort in the patient. Comparative analysis of narratives provided by the patient before and after the completion of measures to level dysphagia revealed motivational shift towards achieving tendency and affiliative tendency. The number of patient's statements related to the categories of anxiety and fear decreased with the increasing number of statements related to confidence in achieving good rehabilitation result. All of the above provided the necessary conditions for further successful speech rehabilitation.

CONCLUSION

The findings show that the timely speech therapy impact aimed at swallowing process recovery, discussed in the case study, may be considered the necessary and urgent type of rehabilitation impact used during the early stages of rehabilitation in case of the postoperative dysphagia occurrence. Early correctional-pedagogical sessions with psychological support within comprehensive rehabilitation facilitated the lasting positive effect, improved the patient's psychological condition, had a favorable influence on the quality of life, facilitating leveling up of rehabilitation potential and specific meaning work of the person in the new non-everyday situation of being.

References

1. Reshetov IV, Polunin GV, Ananichuk AV, Ippolitov LI, Kovalenko AA. Vozmozhnosti vosstanovleniya funktsii gortani: sovremennyy podhod. Vestnik otorinolaringologii. 2017; 82 (6): 18–23. Russian.
2. Klinicheskie rekomendatsii. Differentsirovannyj rak shchitovidnoj zhelezy. M.: Ministerstvo zdravoohraneniya RF, 2020; 47 s. Russian.
3. Lavrova EV. Logopediya. Osnovy fonopedii. M.: V. Sekachev, 2016; 182 s. Russian.
4. Orlova OS, Uklonskaya DV. Optimizatsiya metodov korrektsionno pedagogicheskogo vozdejstviya pri narusheniyah rechi i glotaniya u lits posle hirurgicheskogo lecheniya opuholej golovy i shei. Spetsialnoe obrazovanie. 2017; 3 (47): 122–30. Russian.
5. Ikenshtejn, Guntram V. i dr. Diagnostika i lechenie nejrogennoj disfagii. Bremen-London-Boston: UNI-MED Verlag AG; 96 s. Russian.
6. Balashova IN, Belkin AA, Zueva DN. Diagnostika i lechenie disfagii pri zabelevaniyah tsentralnoj nervnoj sistemy. Klinicheskie rekomendatsii. M., 2013; 38 s. Russian.
7. Orlova OS, Uklonskaya DV, Pokrovskaya YuA, Polyakova TA, Berdnikovich ES, Minaeva OD i dr. Disfagiya u detej i vzroslyh. Logopedicheskie tekhnologii. M.: LOGOMAG, 2020; 116 s. Russian.
8. Uklonskaya D, Agaeva V, Pokrovskaya Yu. Professionalism of speech pathologist as a member of multidisciplinary team:

- competence in dysphagia correction. SHS Web of Conferences. 2020; (87): Art.№00066.
9. Magomed Eminov MSh, Orlova OS, Uklonskaya DV, Zborovskaya YuM. Logopedicheskaya rabota kak znachimyj aspekt rannej kompleksnoj reabilitatsii patsientov posle hirurgicheskogo lecheniya opuholej golovy i shei. *Sovremennyy uchyonyj*. 2020; (4): 35–40. Russian.
 10. Wing-Hei Viola Yu, Che-Wei Wu. Speech therapy after thyroidectomy. *Gland Surg*. 2017; 6 (5): 501–9.
 11. Prikaz Ministerstva zdravooohraneniya RF ot 31 iyulya 2020 g. N788n «Ob utverzhdenii Poryadka organizacii medicinskoj reabilitacii vzroslyh». Russian.
 12. Dajhes NA. Mezhdisciplinarnyj podhod i novye tekhnologii v nauchno-klinicheskom razvitii otorinolaringologii. *Vestnik Rossijskoj Akademii Nauk*. 2021; 91 (7): 58–65. Russian.
 13. Magomed-Eminov MSh. Deyatel'nostno-smyslovoj podhod k psihologicheskoy transformacii lichnosti [dissertaciya]. M., 2009. Russian.
 14. Lelyuk SA, Uklonskaya DV, Reshetov DN, Sokolova OB, Timchenko IV, Hohlov IA, Matveeva SP, avtory; Lelyuk SA, Uklonskaya DV, patentoobladateli. Sposob diagnostiki nejrogennoj perifericheskoj disfagii pri ogranicheniyah podvizhnosti gortani pod kontrolem transnazal'noj endoskopicheskoy laringoskopii. Patent RF № RU 2748545 C1. 26.05.2021. Russian.
 15. Malagelada J, Bazzoli F, Boeckxstaens G, De Looze D, Fried M, Kahrilas P i dr. Disfagiya. Global'nye prakticheskie rekomendacii i Kaskady. *Obnovlenie Sentyabr' 2014*. Vsemirnaya gastroenterologicheskaya organizaciya, 2014; 25 s. Russian.

Литература

1. Решетов И. В., Полуниин Г. В., Ананичук А. В., Ипполитов Л. И., Коваленко А. А. Возможности восстановления функции гортани: современный подход. *Вестник оториноларингологии*. 2017; 82 (6): 18–23.
2. Клинические рекомендации. Дифференцированный рак щитовидной железы. М.: Министерство здравоохранения РФ, 2020; 47 с.
3. Лаврова Е. В. Логопедия. Основы фонopedии. М.: В. Секачев, 2016; 182 с.
4. Орлова О. С., Уклонская Д. В. Оптимизация методов коррекционно-педагогического воздействия при нарушениях речи и глотания у лиц после хирургического лечения опухолей головы и шеи. *Специальное образование*. 2017; 3 (47): 122–30.
5. Икенштейн, Гунтрам В. и др. Диагностика и лечение нейрогенной дисфагии. Бремен-Лондон-Бостон: UNI-MED Verlag AG; 96 с.
6. Балашова И. Н., Белкин А. А., Зуева Д. Н. Диагностика и лечение дисфагии при заболеваниях центральной нервной системы. *Клинические рекомендации*. М., 2013; 38 с.
7. Орлова О. С., Уклонская Д. В., Покровская Ю. А., Полякова Т. А., Бердникович Е. С., Минаева О. Д. и др. Дисфагия у детей и взрослых. *Логопедические технологии*. М.: ЛОГОМАГ, 2020; 116 с.
8. Uklonskaya D, Agaeva V, Pokrovskaya Yu. Professionalism of speech pathologist as a member of multidisciplinary team: competence in dysphagia correction. SHS Web of Conferences. 2020; (87): Art.№00066.
9. Магомед-Эминов М. Ш., Орлова О. С., Уклонская Д. В., Зборовская Ю. М. Логопедическая работа как значимый аспект ранней комплексной реабилитации пациентов после хирургического лечения опухолей головы и шеи. *Современный ученый*. 2020; (4): 35–40.
10. Wing-Hei Viola Yu, Che-Wei Wu. Speech therapy after thyroidectomy. *Gland Surg*. 2017; 6 (5): 501–9.
11. Приказ Министерства здравоохранения РФ от 31 июля 2020 г. N788n «Об утверждении Порядка организации медицинской реабилитации взрослых».
12. Дайхес Н. А. Междисциплинарный подход и новые технологии в научно-клиническом развитии оториноларингологии. *Вестник Российской Академии Наук*. 2021; 91 (7): 58–65.
13. Магомед-Эминов М. Ш. Деятельностно-смысловой подход к психологической трансформации личности [диссертация]. М., 2009.
14. Лелюк С. А., Уклонская Д. В., Решетов Д. Н., Соколова О. Б., Тимченко И. В., Хохлов И. А., Матвеева С. П., авторы; Лелюк С. А., Уклонская Д. В., патентообладатели. Спосob диагностики нейрогенной периферической дисфагии при ограничениях подвижности гортани под контролем трансназальной эндоскопической ларингоскопии. Патент РФ № RU 2748545 C1. 26.05.2021.
15. Malagelada J, Bazzoli F, Boeckxstaens G, De Looze D, Fried M, Kahrilas P. и др. Дисфагия. Глобальные практические рекомендации и Каскады. *Обновление Сентябрь 2014*. Всемирная гастроэнтерологическая организация, 2014; 25 с.