



Paralytic Stenosis of the Larynx: Patients Surgical Overview



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Abstract

The study aimed to evaluate the effectiveness of various types of surgical treatment of patients with bilateral paralytic stenosis of the larynx. The study involved 28 patients aged 18 to 75 years, suffering from paralytic stenosis of the larynx, who was treated at the ENT department of the multidisciplinary clinic of the Tashkent Medical Academy in the period from 2015 to 2020. The results of treatment with the use of laterofixation of the vocal fold, partial excision of the vocal fold in the posterior third, and the vocal process of the arytenoid cartilage showed that after the above methods of surgical intervention, recurrence of stenosis occurs in 20-25% of cases, therefore it is necessary to develop tactics of surgical treatment and postoperative management of this category patients.

Keywords

*category patients;
healthy tissue;
larynx;
laterfixation;
paralytic;
patients treatment;
surgical intervention;
vocal folds;*

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Contents

Abstract.....	386
1 Introduction.....	387
2 Materials and Methods.....	387
3 Results and Discussions.....	388
4 Conclusion.....	389
Acknowledgments.....	389
References.....	390
Biography of Authors.....	392

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1 Introduction

Violation of normal physiological respiration through the natural respiratory tract contributes to the many pathological conditions of the human body (Vokhidov et al., 2020). Patients with chronic stenosis of the larynx and trachea inevitably develop disorders in the activity of the nervous, respiratory, hematopoietic, cardiovascular systems, etc., which is determined by the features of the body's adaptation mechanism (Kryukov, 2016; Shen et al., 2002). The main causes of peripheral paralysis of the larynx: a) medical trauma during surgery on the neck and chest; b) compression of the nerve trunk due to a tumor or metastatic process in the neck and chest, tracheal or esophageal diverticulum, hematomas or infiltrates in trauma and inflammatory processes, with an increase in the size of the heart and aortic arch (Fallot's tetrad, mitral disease, aortic aneurysm, hypertrophy ventricles, dilatation of the pulmonary artery); c) neuritis of inflammatory, toxic or metabolic genesis: viral, toxic (poisoning with barbiturates, organophosphates, and alkaloids), hypocalcemic, hypokalemic, diabetic, thyrotoxic. The most common cause of paralysis is thyroid pathology and trauma during surgery on the thyroid gland (Jaime et al., 2001; Parmin et al., 2020).

2 Materials and Methods

There is currently no unified treatment strategy for bilateral laryngeal paralysis (Dell'Aversano et al., 2005). It is determined by the etiology of the disease, the severity of clinical symptoms, the degree of functional disorders, the nature of the adaptive and compensatory mechanisms (Svistushkin et al., 2018; Bradley, 2000). The effectiveness of the surgical treatment of bilateral paralysis depends on the task of reconstructing the larynx and the method of its implementation (Kokorina & Khoruk, 2013; Damrose, 2009). We have developed and implemented a tactic for the treatment of patients with bilateral paralysis of the larynx, based on an individual approach to planning surgical treatment (Mehrholtz et al., 2007; Widana et al., 2021). Functional surgery of bilateral paralysis of the larynx has many features: a) During preoperative examination clarifying the degree of damage and factors that complicate the results of the surgery; b) Surgical approach should be carefully planned in a step-by-step manner and the only method is chosen from all the proposed alternative technologies (Deryagin et al., 2002; Deman et al., 2012). Primary surgery must be 99% successful as the healthy tissue reserves are depleted; d) Plasty on the vocal region on the operation side with auto or allo-tissues significantly improves the functional result of surgery (figure 1).

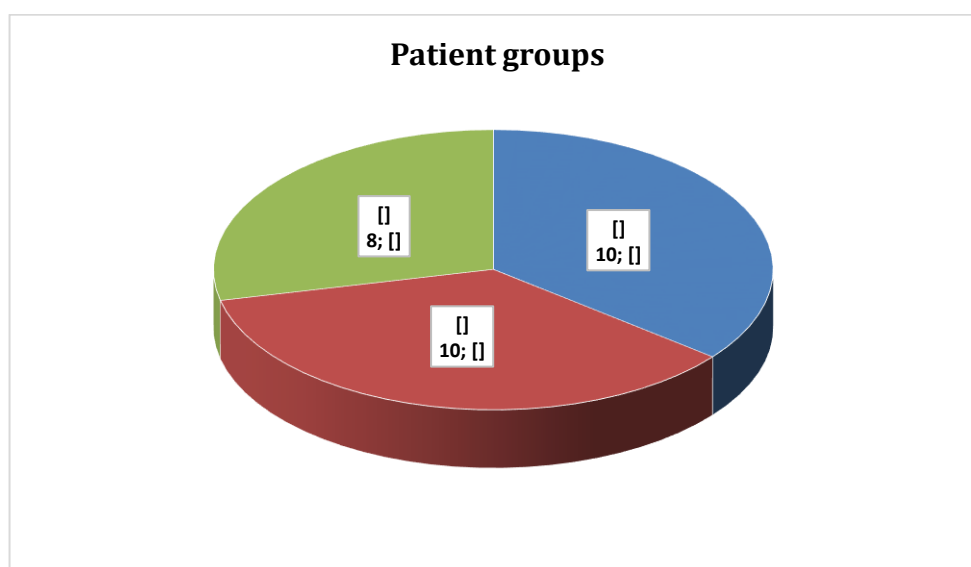


Figure 1. The patient groups

3 Results and Discussions

Patients were divided into 3 groups depending on the type of surgical intervention. Patients of group I underwent simultaneous tracheostomy and unilateral myoartenoid cordectomy (Mareev & Starostina, 2019). Patients of group II underwent tracheostomy, prosthetics of the cervical trachea, and 1.5–2 months delayed reconstructive operation on the vocal folds (the period of adaptation to the tracheal stent, elimination of the consequences of hypoxia, the early postoperative period after extirpation of the thyroid gland) (Svistushkin et al., 2018; Sulasmi et al., 2021). Patients of group III underwent tracheostomy (Lim et al., 2021), prosthetics of the cervical trachea, reconstructive surgery was delayed for a longer period (3-4 months, Figure 2).

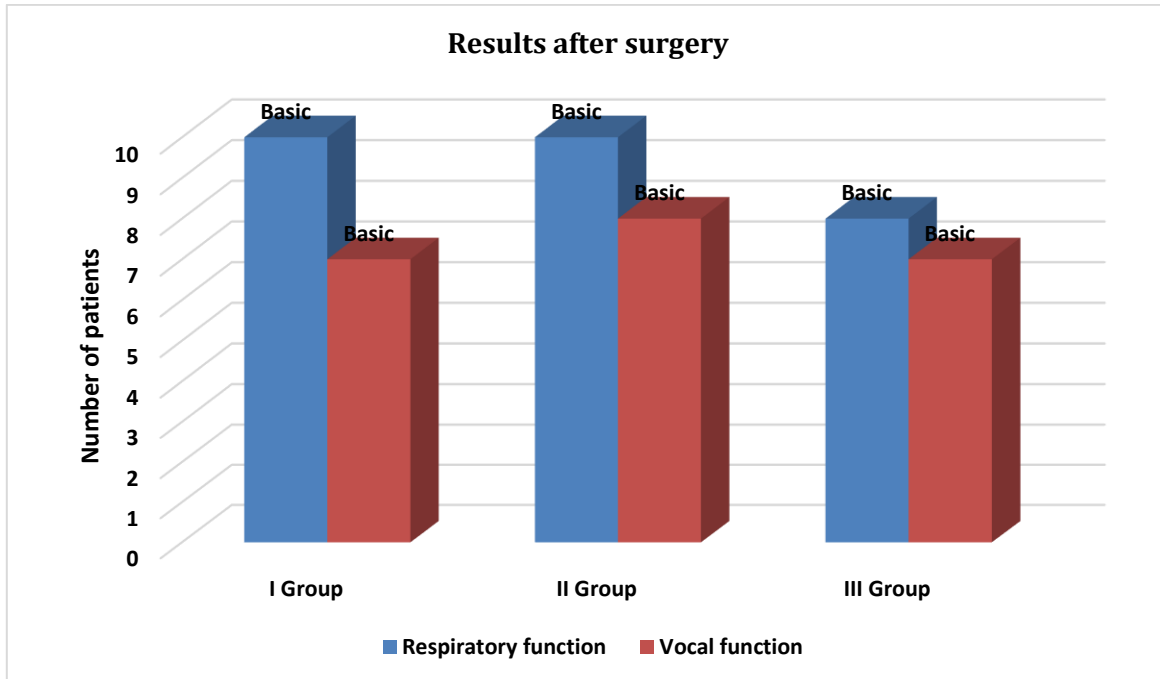


Figure 2. Results after surgery

Patients with somatic disorders on the background of endocrine disorders, chronic hypoxia, severe inflammation in the tracheostomy area (Hyodo et al., 2009). In most cases, a unilateral myoartenoid cordectomy was performed with or without laterofixation of the opposite vocal fold (Dolgov & Rogova, 2016). This depended on the anatomical features of the larynx, the method of access - extra-laryngeal or endolaryngeal. When performing laryngotracheoplasty with unilateral myoartenoidochordectomy and laterofixation of the opposite vocal fold, we usually removed the right vocal fold (Alimetov, 2016; Lidia et al., 2010). This operation included the following stages: a) opening larynx by dissecting the arch of the cricoid and thyroid cartilage by no more than 2/3; -bordering incision with a sickle-shaped scalpel of the mucous membrane of the larynx in the area of the arytenoid cartilage and gentle peeling of the latter; b) suturing the defect in the mucous membrane of the larynx, fixing the mucous membrane and the rest of the vocal fold to the lateral wall of the larynx using a U-shaped suture; c) installation in the laryngeal-tracheal bed of the "obturator finger" and layer-by-layer suturing of the larynx (the volume and length of the "finger" tampon were selected individually, depending on the size of the laryngeal-tracheal lumen); d) installation of a tracheostomy tube made of thermoplastic material of the required diameter into the lumen of the trachea. The final stage of surgical treatment was the suturing of the tracheal defect according to Y.S. Bokstein after control observation and examination (Kokorina & Horuk, 2017; Asriyati et al., 2021). During the control period, the patients were without tracheal prosthesis, with a tracheostomy, the dynamics of the objective picture were assessed daily according to the data of indirect laryngoscopy, retrograde examination of the throat (Starostina, 2017; Choudhury et al., 2009). The reduction of the rehabilitation period was achieved due to the

following factors: a) reduction of the stages of surgical treatment, due to their combination, the absence of a stage of laryngotomy formation, suturing of the larynx at the end of the operation, which avoids the resorption of cartilaginous structures that require the subsequent formation of lateral walls using the implantation of alloplastic material; b) the use of drugs with antihypoxic and antioxidant effects (Mexidol, pentoxifylline, NSAIDs, HBO in the early postoperative period; c) the use of adequate prosthetics; d) objectification of the timing of surgical intervention and prosthetics due to the study of indicators of restoration of respiratory function and tissue reoxygenation (Pluzhnikov et al., 2017).

4 Conclusion

The presented methods of surgical treatment of patients with bilateral paralysis of the larynx allowed to establish the following: out of the proposed types of surgical intervention on the larynx, the most effective and often used method was unilateral myoartenoid cordectomy. This method was supported by laterfixation of the opposite vocal fold (Kurtieva et al., 2021). Were presented moments and without laterofixation of the vocal fold from the opposite side. Rehabilitation of patients with bilateral laryngeal paralysis makes it possible to achieve complete restoration of respiratory function and partial restoration of vocal function in 78,5% of cases. The rehabilitation period for patients with simultaneous tracheostomy and laryngoplasty is 3-4 months.

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