CLINICAL AND FUNCTIONAL FEATURES OF PATIENTS WITH EXTENSIVE LARYNGEAL DEFECTS THROUGHOUT RESTORATIVE THERAPY

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ANNOTATION: *Extensive defects of the larynx represent a major clinical challenge and commonly result from traumatic injuries, oncological conditions, or surgical procedures. Such defects severely compromise the larynx's essential functions, including phonation, respiration, and swallowing, leading to a marked deterioration in patients' quality of life. Effective management requires a comprehensive, multidisciplinary therapeutic strategy. Timely intervention combined with a structured rehabilitation program significantly enhances functional recovery; however, continuous monitoring of clinical and functional changes throughout the rehabilitation process is crucial for optimizing treatment outcomes.*

Contemporary medical practice offers a wide range of therapeutic options for patients with laryngeal defects, including reconstructive surgical techniques as well as targeted physiotherapy and speech-language interventions. This study investigates the clinical and functional features of patients with extensive laryngeal defects and evaluates functional recovery dynamics at different stages of rehabilitation.

KEYWORDS: *Extensive laryngeal defects; restorative treatment; laryngeal function rehabilitation; respiratory disorders; voice recovery;*

swallowing dysfunction; post-intubation stenosis; tracheostomy; reconstructive surgery; decalcified bone grafts; phonopedic therapy; speech therapy; physiotherapy; quality of life; upper airway reconstruction.

AIM OF THE STUDY

The objective of this research is to assess the clinical and functional status of patients with extensive laryngeal defects at various stages of restorative treatment. Particular attention is given to identifying impairments in respiratory, vocal, and swallowing functions and evaluating the effectiveness of different rehabilitation strategies to develop optimized, individualized treatment protocols.

SUBJECTS AND METHODS

The study population consisted of patients with extensive laryngeal defects caused by traumatic injuries, neoplastic processes, or postoperative complications. All participants underwent comprehensive treatment and rehabilitation using diverse methods aimed at restoring laryngeal structure and function.

Special emphasis was placed on patients with post-intubation stenosis, tracheostomy secondary to laryngeal paralysis, and tumor-related defects. The etiological distribution of laryngeal defects included external trauma (20%), reanimation-related procedures such as intubation and tracheostomy (30.9%), and post-oncological surgical interventions (49.1%).

Patient evaluation was conducted using a combination of clinical and functional assessment techniques:

- **Clinical assessment:** Analysis of symptoms related to respiratory, phonatory, and swallowing disorders at different treatment stages.
- **Instrumental diagnostics:** Fibrolaryngoscopy for visualization of vocal fold mobility and airway patency, supplemented by radiographic and computed tomography imaging to delineate structural defects.

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- **Functional testing:** Spirometry was employed to assess respiratory function, while swallowing ability was evaluated using standardized water-swallowing tests. Quality of life was measured using validated questionnaires.
- **Rehabilitation interventions:** Phonopedic therapy, speech therapy, and physical rehabilitation were applied to improve breathing and swallowing functions. In cases of severe anatomical damage, reconstructive surgical procedures were performed, particularly following oncological resections.

RESULTS

Patients in the early postoperative period demonstrated pronounced impairments in respiratory and vocal functions. Breathing difficulties requiring temporary tracheostomy were observed in 70% of patients, while 60% exhibited significant dysphonia. Swallowing dysfunction was present in 50% of cases, increasing the risk of aspiration and recurrent respiratory infections.

Among patients with post-intubation stenosis, airway reconstruction using decalcified bone grafts yielded favorable long-term outcomes, with fewer complications compared to alternative materials. This technique was applied in 55 patients, achieving complete defect resolution in 92.7% of cases. Overall, rehabilitation interventions led to functional improvement in 80% of patients.

Phonopedic therapy contributed substantially to the restoration of vocal quality, including timbre, intensity, and pitch. As a result, 65% of patients were able to discontinue tracheostomy use within six months following surgery.

Long-term follow-up demonstrated sustained improvement in respiratory mechanics and normalization of respiratory muscle function. Nearly all patients showed an increase in maximal forced inspiratory and expiratory flow rates by 0.5–1.5 L/s within one year.

CONCLUSION

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Extensive laryngeal defects exert a profound negative impact on respiratory, vocal, and swallowing functions, necessitating an individualized and multidisciplinary therapeutic approach. Systematic evaluation of clinical and functional parameters throughout the rehabilitation process significantly enhances the effectiveness of restorative treatment. The integration of speech therapy, phonopedic therapy, and physiotherapy plays a crucial role in improving patients' quality of life through the recovery of essential laryngeal functions.

The successful application of decalcified bone tissue in reconstructive surgery represents a promising strategy for repairing structural defects of the larynx and trachea, providing durable and stable functional outcomes. Continued refinement of reconstructive and rehabilitative techniques remains a priority in the advancement of upper airway surgery.

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