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TRANSIENT SPEECH AND SWALLOWING DYSFUNCTION WITHOUT EVIDENT NERVE INJURY FOLLOWING TOTAL THYROIDECTOMY

Introduction

Total thyroidectomy is one of the most common surgical procedure performed in the neck region. The increasing frequency of diagnosing thyroid diseases in the asymptomatic phase, as part of routine medical exams, has resulted in a higher rate of detecting various benign and malignant lesions that, according to the protocol, require total thyroidectomy. The most common indications for total thyroidectomy are benign enlargements in the form of diffuse or multinodular goiters, thyrotoxicosis refractory to conservative therapy, toxic adenoma, and malignant lesions. (1)

Postoperative complications occur due to temporary or permanent paresis of the laryngeal nerves, primarily the recurrent laryngeal nerve (RLN), and less frequently (or less commonly recognized) the superior laryngeal nerve (SLN), including both its external and internal branches. Analysis of a large number of studies has found that the incidence of all RLN damage, both morphological and functional, ranges from 0% to 38.4%. (2) Due to the difficulty in clinically recognizing injuries to the superior laryngeal nerve (SLN), the incidence range is between 14% and 20%. (3,4) Paresis of the laryngeal nerves after surgery is rarely a result of direct nerve injury by the surgeon, but more often occurs due to ischemia, compression, and swelling of the nerve due to manipulation in the surgical field during the procedure. Although most of these injuries are temporary, the symptoms and clinical signs are serious and affect the vital functions of the patient. The most severe symptoms include impaired breathing, speech, and swallowing, which, if not promptly recognized and properly treated, can have severe consequences. The treatment of patients with impaired functions requires creating an individual protocol for each case. The monitoring and

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treatment process is long-lasting and includes securing the airway, optimal nutrition, prevention of aspiration pneumonia, and psychological support throughout the entire treatment period.

The aim of this case presentation is to highlight the possibility of postoperative paresis of the laryngeal nerves in the absence of direct iatrogenic injury and to emphasize the importance of a multidisciplinary approach to treatment in order to achieve optimal treatment outcomes.

Case Presentation

A 73-year-old female patient presented to an endocrinologist in March 2024 due to complaints of a sensation of tightness in the neck. Ultrasound examination of the thyroid confirmed an enlarged left lobe of the thyroid gland, which displaced the trachea to the right with a dominant nodule measuring 3x2.5 cm. Following the protocol, a fine needle aspiration biopsy (FNAB) was performed, yielding a cytological result: Bethesda V. The patient's medical history included depression and chronic constipation, and she was on antidepressant therapy.

After complete preoperative preparation, the patient was admitted to the general surgery department. The surgery, which proceeded without complications, was performed in May 2024. Intraoperatively, a nodule approximately 3 cm in size in the left thyroid lobe was verified, compressing and displacing the trachea to the right. This lesion did not infiltrate the thyroid capsule, and no regional lymphadenopathy was detected. A total thyroidectomy was performed with verification and preservation of both recurrent laryngeal nerves and all four parathyroid glands. Two drains were placed in the thyroid bed. In the early postoperative period, the patient developed significant hoarseness, but there were no respiratory issues. On the first postoperative day, when oral intake was resumed, the patient exhibited severe choking when swallowing food and liquids. Oral intake was immediately discontinued, and an ENT specialist was consulted. After fiber-laryngomicroscopy, both halves of the larynx were found to be immobile, with the vocal cords slightly bowed. The respiratory passage between the posterior parts of the vocal cords was passable for the diameter of the fiber endoscope (3-4 mm). A test with the endoscope tip confirmed the absence of reflex mechanisms for glottis closure. Saliva was observed spilling into the trachea at the level of the glottis. Due to complete loss of sensitivity in the supraglottis and bilateral immobility of the larynx, a nutritional gastrostomy or placement of a nasogastric tube with tracheostomy was suggested as a prevention for aspiration of food and liquids.

During further hospitalization, the patient remained in good overall condition, was respiratory sufficient at rest and with effort, and the wound healed per primam. The drains were removed, and conservative therapy was regularly administered. Laboratory analyses were consistently satisfactory, and the lung examination was

normal, as confirmed by an X-ray of the lungs. An endocrinologist was consulted and substitution therapy was introduced, along with a psychiatrist for the worsening of the patient's depression. On follow-up, an ENT examination showed both vocal cords immobile, with a respiratory space of 4-5 mm between the posterior parts of the vocal cords. A sensitivity test of the supraglottic region of the larynx elicited a reflex. A forced cough showed slight bilateral mobility of the arytenoids, and saliva continued to spill into the trachea at the level of the glottis. The patient underwent conservative treatment, including swallowing exercises, which resulted in clinical improvement in swallowing function. The patient was transitioned to full oral intake, with adequate swallowing of solid food. There was still occasional choking when drinking liquids, but the patient remained respiratory stable.

Despite adequate oral intake and clinical improvement in swallowing function, available diagnostic methods indicated no significant recovery of nerve function. Due to continued risk of aspiration and subsequent complications, the decision was made to perform a tracheostomy. The patient was informed of the indication for tracheostomy in the course of treatment, but after consultation with her family, she explicitly refused the procedure. Three weeks after the surgical treatment, she was discharged for further home care. At discharge, the patient was hemodynamically and respiratory stable, with satisfactory oral intake and no respiratory complaints. On regular follow-ups, the patient reported adequate oral intake while practicing swallowing exercises. Subsequent fiber-laryngomicroscopies indicated gradual recovery of function. By late July 2024, full recovery of speech and swallowing function was achieved.

Discussion

Numerous risk factors for the development of postoperative paresis/paralysis of the laryngeal nerves have been identified, including age over 65 years, previous surgeries in the neck region, malignant lesions, large goiters, ASA status, coagulation factor disturbances, and elevated nitrogenous substances (creatinine greater than 120 for men and 110 for women). (1, 5)

Temporary changes in voice quality after total thyroidectomy occur in 38% to 87% of patients, while permanent changes are described in 13% to 35% of cases. (6, 7) Transient swallowing difficulties occur in about 80% of cases, and persist in approximately 20% of patients. The most serious problems arise due to damage to the RLN. Temporary RLN damage occurs in 1.4% to 38.4% of cases, while permanent damage ranges from 0% to 18.6%. (8, 9, 10, 11) Due to the difficulty in clinically recognizing injury to the superior laryngeal nerve (SLN), the incidence range is between 14% and 20%. (3,4) Although direct nerve injury during surgery is rare, it is the greatest fear of every endocrine surgeon. The most frequent causes of these complications are related to the surgical procedure itself and include indirect nerve

damage due to ischemia, compression, and swelling caused by manipulation in the surgical field. Additionally, paresis can result from decompression of a nerve previously compressed by a large goiter, a hematoma that developed in the thyroid bed, or more rarely, vocal cord injury during endotracheal intubation. However, there have been cases in the literature where postoperative symptoms of laryngeal nerve paresis have occurred, despite the absence of the aforementioned causes. (12)

Symptoms of laryngeal nerve paresis manifest in various forms, ranging from mild hoarseness, changes in voice quality, to severe dysphonia, stridor, choking, and dysphagia. In the most severe cases, vocal cord paralysis is confirmed, with the cords remaining in a medial position, resulting in inadequate respiratory space and necessitating immediate tracheostomy. Dysphagic symptoms prevent adequate oral intake and if there is incomplete closure of the epiglottis, aspiration pneumonia can result from food and saliva entering the tracheobronchial tree. (13)

Postoperative diagnostic modalities include fiberoptic pharyngolaryngomicroscopy, indirect laryngoscopy, videolaryngostroboscopy (VLS), EMNG evaluation, as well as patient-reported symptoms. In most studies, the diagnosis of laryngeal nerve impairment is made based solely on laryngoscopically verified vocal cord paralysis through indirect laryngoscopy. (5, 14, 15) Videolaryngostroboscopy (VLS) is used for detailed observation of small changes in vocal cord mobility and analysis of the physiological and pathological characteristics of glottal vibration. It is also possible to observe the morphology and appearance of the vocal cords: color, volume, vascularization, integrity, and the presence of lesions. Symmetry, periodicity, glottal closure, width, and progression of the mucosal wave can be analyzed. (3, 4)

The treatment of patients with impaired breathing, speech, and swallowing functions requires a multidisciplinary and individualized approach. Intensive conservative treatment includes short-term use of corticosteroids to reduce edema and inflammation, with continuous monitoring of vital parameters, such as oxygen saturation, heart rate, and blood pressure. For patients with significantly impaired swallowing, oral intake is temporarily suspended, and enteral nutrition is provided via nasogastric tube or gastrostomy to ensure adequate caloric and nutritional intake. In patients with severe respiratory difficulties, such as stridor or significant upper airway insufficiency, invasive surgical procedures, such as tracheostomy, are necessary to ensure adequate ventilation. Simultaneously, the implementation of phoniatric exercises plays a crucial role in voice rehabilitation, reducing dysphagia, and improving the

quality of life for patients. Intraoperative neuromonitoring (IONM), as a modern method for protecting laryngeal nerves during surgery, significantly reduces the incidence of postoperative speech and swallowing disorders. However, its use is still not standard in most healthcare centers, primarily due to technical and financial limitations. The implementation of this method in daily practice could contribute to improved outcomes and reduced complications. (16, 17) During the recovery period, a multidisciplinary approach is essential, involving healthcare professionals from various specialties, such as anesthesiologists, ENT specialists, surgeons, phoniatrists, and nutritionists. This collaboration ensures optimal patient care and allows for the adjustment of treatment protocols based on the severity of symptoms, functional capacity, and overall health status. In addition to medical interventions, special attention is given to psychological support for patients, as breathing, speech, and swallowing disorders can significantly affect emotional well-being and quality of life. Educating patients and their families about the importance of rehabilitation and exercises, as well as regular follow-up visits, is key to the long-term success of treatment. (18, 19, 20)

Conclusion

Considering that the most severe complications affect the patient's vital functions and demand prompt diagnosis and immediate treatment, it is crucial that such surgical procedures be performed in institutions equipped to provide a multidisciplinary approach, with the involvement of specialists from various medical fields.

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