CHAPTER 34

SURGICAL TREATMENT OF UNCOMMON TRACHEAL DISEASES

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INTRODUCTION

Rare tracheal diseases are divided into two main groups—neoplastic and non-neoplastic diseases (Table). As tracheal neoplasms are described in another chapter, non-neoplastic diseases are discussed here. Rare non-neoplastic tracheal conditions are classified as infectious (tuberculosis, histoplasmosis, mucormycosis), external compression (vascular compression, postpneumonectomy syndrome, mediastinal mass, goiter), inflammatory diseases (Wegener granulomatosis, sarcoidosis, amyloidosis, relapsing polychondritis) tracheal tissue-related idiopathic diseases (tracheopathiaosteoplastica, tracheobronchomegaly, saber-sheath trachea, idiopathic laryngotracheal stenosis), and traumas (blunt trauma, penetrating trauma, and burns). Surgical indications for these situations are; severe symptoms, some complications with or unresponsiveness to medical therapy, and bronchoscopic procedures.

INFECTIONS

Tuberculosis

Airway tuberculosis is one of the rare causes of symptomatic tracheal stenosis. Almost half of tuberculosis occurs in the airways, and few of them cause tracheal tuberculosis [1]. Since it has a non-specific presentation, its diagnosis may be delayed. Possible mechanisms in the pathogenesis of tracheal tuberculosis are as follows: direct spread of the bacillus from the parenchymal lesion to the major airways, lymphogenous spread, inoculation of the bacillus from the lymph node to the airway via fistula, and spread by inhalation. The diagnosis is made by microbiological and histopathological examinations of samples taken by bronchoscopic lavage,since sputum acid-fast stain has a low sensitivity [2]. Although many patients are sensitive to medical treatment, tracheal stenosis develops in 20% of patients. Tracheal stenosis may develop in the active or fibrotic period of tuberculosis. In patients with stenosis occurring in the active period, histopathologically hyperplastic changes and edema are detected. In addition, computed tomography (CT) shows irregular lumen stenosis, thickening of the tracheal wall, enhancement, and lymphadenopathy, whereas smooth-edged narrowing and accompanying minimal tracheal wall thickening are typical in fibrotic stenosis [3]. The first treatment choice in stenosis is non-surgical approaches such as bronchoscopic interventions, repeated dilatation, and stent applications. Surgery is challenging, as there may be multifocal and long segment stenosis[1]. Tracheal resection and reconstruction are required for short segment stenosis that has not improved with medical treatment and endobronchial interventions.

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trachea (Fig. 4). The index is calculated by the ratio of the coronal diameter of the trachea to its sagittal diameter; when it is detected as smaller than 0.67, diagnosisis confirmed. Surgery is not recommended for treatment [15,21].

Idiopathic Laryngotracheal Stenosis

Idiopathic laryngotracheal stenosis is generally seen in women and affects different ages. This condition is characterized by progressive exertional dyspnea and wheezing. Patients have no history of typical causes of stenosis, such as prolonged intubation, trauma, burn, etc., nor mediastinal fibrosis or lypmhadenomegaly. Serum ANCA values should be measured to exclude a diagnosis of Wegener. Stenosis is often circumferential, and vocal cords are normal. Radiologically and bronchoscopically, the stenosis area is often detected at the junction of the cricoid cartilage and the trachea (Fig. 5). The length of the stenosis is usually short, and the part of the trachea distal to the stenotic segment is normal. It has been reported that idiopathic laryngotracheal stenosis is not a progressive disease; the degree of stenosis does not increase. Treatment options include tracheal resection, recurrent bronchoscopic dilatations, and steroid injection to the stenotic area. Tracheal resection should not be considered in the following situations: stenosis involvement of vocal cords and the presence of intense inflammation-granulation in the stenotic segment. [1,15, 22].

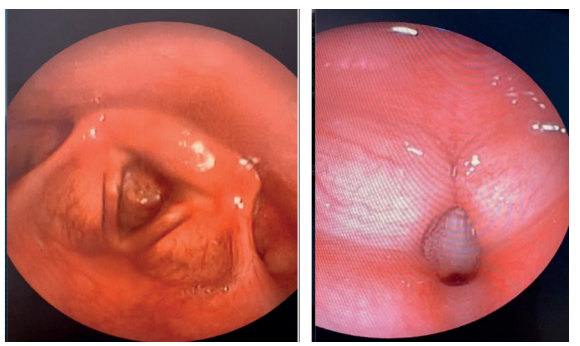

Figure 5. Bronchoscopic view of idiopathic laringotracheal stenosis.

Inhalation Injury

Airway burns may occur from inhalation of heat, smoke, or chemical agents. It is an important cofactor for mortality in patients with burn injuries. The supraglottic area is protected in inhalation injury—the main damage occurs in the infraglottic region and lower airways [1]. Studies have reported that burn-related damage is in the mucosa and submucosa, and tracheal cartilages are preserved. Especially in the early inflammatory phase of the burn, tracheal resection should be avoided, and adequate airway clearance should be provided with interventions such as tracheal splint, tracheostomy, and t-tube. For a resection plan, the end of the inflammatory phase should be awaited to see whether the patient has excessive response to the burn [1,23].

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