CHAPTER 55

ENDOBRONCHIAL INTERVENTIONS: TUMORS AND STENOSIS

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Bronchoscopy is a minimally invasive method that has an important place in the diagnosis and treatment of respiratory system diseases. ENT specialist Gustav Killian performed the first known intervention of this important diagnosis and treatment method in 1876 by removing a foreign body from a farmer's trachea [1]. In the early 1900s, the first prototype of the rigid bronchoscopes we use today was produced and started to be used by American ENT specialist Chevalier Jackson [2]. After this important discovery, many developments have been made one after the other, especially for therapeutic bronchoscopic interventions. Edwin Broyles started using telescopic optics in 1940 and optical forceps in 1948. In 1962, when he started to use the flexible bronchoscope structure, the use of rigid bronchoscope was restricted [3]. In 1968, the flexible bronchoscope was further developed with the working channel addition, and in 1970, it was made accessible to the upper lobes with a mechanism to control the movements [4]. Endobronchial cryotherapy use of Neel and Sanderson in 1976, CO2 laser use of Laforet, endobronchial electrosurgery procedures of Hooper and Jackson in 1985 and special stent placement instruments and endobronchial laser applications used by Dumon; rigid bronchoscopy have become indispensable for advanced therapeutic bronchoscopic interventions [3].

Table 1. Causes of Airway Obstruction

Benign
Trauma
Complication of intubation
Complication of tracheostomy
Burn injury
Hematoma
Surgery
Lung transplantation
Sleeve resection
Infection
Tuberculosis
Papillomas
Tracheobronchitis
Inflamatory
Wegener granulomatosis
Amyloidosis
Other
Benign tumors
Vascular compression
Tracheomalacia
Retrosternal goiter
Lymphadenopathy
Malignant
Intraluminal
Extraluminal

Each development paved the way for many interventional procedures; early diagnosis methods, palliative interventions in advanced stage

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an intravenously applied tumor-localizing photosensitizer and then an argon or diode laser that sends beams of appropriate wavelength to the endobronchial area. With the reaction developing in the tissue, cell necrosis and tissue destruction are provided. Generally, a second bronchoscopy is needed to clean the lumen after 3-4 days.

While the intravenously administered photosensitizer is cleared from most tissues within approximately 72 hours, it remains in the tumoral tissue, skin and liver for a longer time. For this reason, light activation with flexible or rigid bronchoscopy is planned for 48-72 hours after intravenous drug injection [16]. Thus, the healthy tissue is prevented from being affected. Since non-thermal laser light is used, there is no immediate effect as in conventional laser applications. Results begin to be obtained in about 2 days.

TRACHEOBRONCHIAL STENTS

Stent applications are commonly used methods to ensure airway patency. They support the opening of the airway not only for reasons causing intraluminal stenosis but also in extrinsic compression. Silicone or metal stents are chosen according to the shape, size, location of the stenosis and the severity of the pressure. Stents are effective in providing airway patency not only in stenosis but also in malaise cases [17]. Stent applications are generally preferred in addition to other treatment applications such as laser and cryotherapy. In this way, it is possible to provide effective airway clearance for a longer period of time.

Silicone stents are often preferred. Generally, stents with thick parts on the upper and lower ends or flat stents with protrusions such as nails outward are used to prevent displacement. Specially produced y-shaped stents are used in carinal strictures. The use of silicone stents also offers easy modification. Its length can be shortened by cutting the ends. In order to avoid aeration problem in the right upper lobe, which we often encounter, a groove or hole can be drilled in the relevant area to provide ventilation.

Expandable metallic stents are usually placed via flexible bronchoscopes. Metallic stent is preferred in cases with severe external compression in which radial strength of silicone stent is insufficient or in cases where sufficient lumen width cannot be provided for the placement of the silicone stent. Until covered metallic stents were introduced, tumor growth through the gaps of the metals of the stent into the lumen, inability to move due to penetration of metals into the tissue, or removal difficulty, restricted its use. It is used safely in eligible patients today.

Stent placement procedures are performed under general anesthesia. After this effective procedure that allows the stricture to expand at the time it is inserted, if there is no other additional pathology, patients are easily extubated. Patients are usually discharged on the same day.

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