# Operative Endoscopy of the Airway With the Old-Fashioned Esophageal Dilators

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**Bronchial dilation is usually required to treat a number of disorders; the most frequent are complications after airway surgery, including lung transplantation, stenosis after radiotherapy, and compression by an extraluminal mass. The procedure is performed by forcing the tip of a rigid bronchoscope through the stenosis using barrels of increasing size; however, when there is a clear discrepancy between the caliber of the rigid instrument and the stenosis, the first step may be difficult. In such cases, we have successfully employed two types of old-fashioned esophageal dilators rescued from the armamentarium of our endoscopy unit.**

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Operative endoscopy of the airway has now gained a stable place in the surgical arena; thoracic surgeons and pulmonologists are familiar with the different interventional techniques, and the indications have been progressively broadened [1, 2]. The modern rigid bronchoscopes and telescopes allow optimal visualization and magnification of the airway; diagnostic and therapeutic maneuvers can be safely performed with simultaneous ventilation of the patient. Laser and stents are currently used to treat a variety of benign and malignant tracheobronchial disorders. The use of laser is indicated to vaporize and coagulate tissue growing inside the airway. When obstruction is caused by extrinsic compression, fibrosis, or malacia of the bronchial wall, however, the use of laser is certainly contraindicated. In those cases, simple dilation should be performed, and stents should be placed if the airway is not stable.

The treatment of bronchial complications after lung transplantation and sleeve resection has been significantly improved with the availability of advanced endoscopic techniques; other indications for simple mechanical dilation with or without stent placement are bronchial stenosis after radiotherapy and extrinsic compression by an external mass.

Dilation is usually performed by progressively forcing the tip of the rigid bronchoscope through the stenosis; the Dumon bronchoscope (Novatech; Aubagne, France), with tubes of different calibers and lengths, has been designed to optimize this procedure. In difficult situations, balloon dilation also could be performed before forcing the rigid scope in the stenosis. However, the first attempt can be sometimes difficult when the stenosis is extremely tight and rigid and shows a large discrepancy with the caliber of the bronchoscope. In such situations, complete opening of the stent placed after dilation could be difficult and take a long time.

In these two settings, we have successfully used two types of old-fashioned esophageal dilators [3] that were rescued from the armamentarium of our endoscopy unit.

## Technique

After inserting the Dumon rigid bronchoscope under deep sedation and local anesthesia, the bronchial stenosis is visualized and evaluated. The tip of the bronchoscope is advanced, and generous local anesthesia is administered (2% xilocaine). If the tip of the bronchoscope is objectively too large, two different types of esophageal dilators can be used: the Chevalier-Jackson bougie with an olive-shaped end (Fig 1) and the Souttar dilators (Fig 2). The former has the advantage of being less rigid and traumatic and can be used for the very first step. The Souttar dilators are metallic, and they have an inside channel that allows "moderate" ventilation during dilation. Both dilators are available in different sizes: the Chevalier-Jackson bougies are 11 cm long, the tip goes from 3 mm to 4 mm, and the major diameter is 3 mm to 6.5 mm; the Souttar dilators are 6 cm long, and the diameter goes from 5 to 10 mm. The dilators can be inserted through the channel of any Dumon adult rigid bronchoscope (inner diameter from 7.4 to 12.2 mm; outer diameter from 9 to 13 mm) and followed by the telescope (better if a pediatric size is used).

In expert hands the dilators can be inserted also without endoscopic visualization; the feeling at the tip of the dilator is of extreme importance to proceed forward. Generous lubrication is applied to the surface of the dilator before insertion; it is gently forced through the stenosis and left in place for a few minutes. After withdrawing the dilator, the results of the maneuver are

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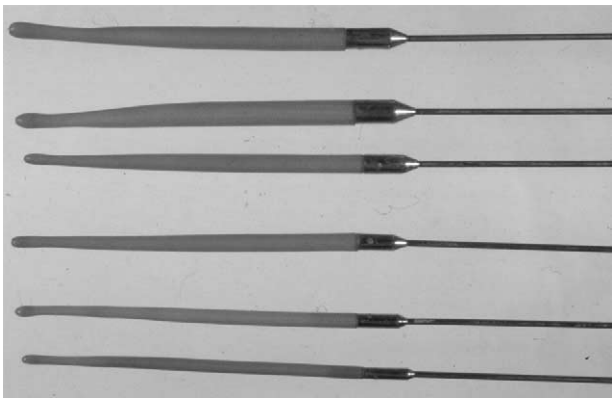

*Fig 1. Chevalier-Jackson bougie with olive-shaped end.*

observed and a larger instrument is inserted in the same way. The airway caliber is progressively improved until the tip of the rigid bronchoscope can be easily inserted through the stenosis; the dilation is completed, increasing progressively the caliber of the rigid scope. After completion of dilation, the bronchoscope is withdrawn above the stenosis, and the final result is carefully evaluated. If the airway tends to collapse, a stent should be inserted. We prefer the Dumon silicon stents (Novatech; Aubagne, France) [4]. It may sometimes be difficult to obtain immediate opening of the stent; insertion of lubricated Souttar dilators within the stent could help opening.

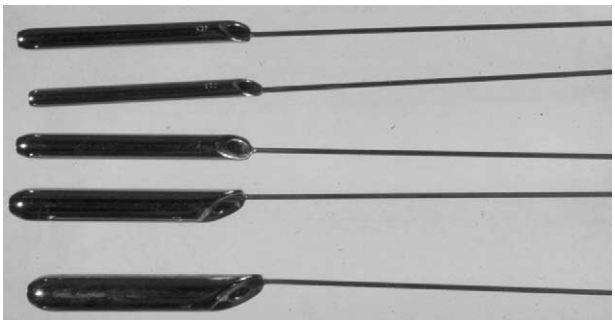

*Fig 2. Souttar dilators. The channel inside the dilator is well visualized.*

This technique of dilation was successfully used to treat 10 bronchial stenoses after lung transplantation, 4 after sleeve lobectomy, 2 after radiotherapy, and 14 due to neoplastic extrinsic compression. In 20 patients, the mechanical dilation was completed with Nd:YAG laser vaporization. In 25 cases, it was necessary to place a stent to keep the airway open after dilation. Souttar dilators were also used to help open bronchial stents in many cases. No complications were observed.

## Comment

Airway obstruction related to benign and malignant diseases can easily cause a significant degree of shortness of breath, with a detrimental impact on quality of life. Operative endoscopy of the airway can contribute to improved function by relieving obstruction and stabilizing the airway caliber. In difficult situations, when there is a clear discrepancy between the calibers of the rigid bronchoscope and the stenosis, mechanical dilation can be easier, faster, and less traumatic with the use of the old-fashioned Chevalier-Jackson and Souttar esophageal dilators. They are easy to use and do not preclude or complicate stent placement. Souttar dilators also can be used to obtain immediate silicone stent opening.

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