

Overview of Bronchoscopy

Bronchoscopy is a procedure in which a thin, cylindrical scope is inserted into the nose or mouth, passed through the trachea, and into the tracheobronchial tree or lungs. The procedure is most commonly performed by a pulmonologist, but also can be performed by a thoracic surgeon. Bronchoscopy is considered the gold standard for diagnosing and staging various pulmonary diseases and conditions, including lung cancer, as it is the least invasive approach.¹

Why Bronchoscopy is Performed²

Bronchoscopy is most commonly used to make a diagnosis in the lung. However, it can be a diagnostic or therapeutic procedure.

Examples of a diagnostic bronchoscopy include those where a tissue sample is obtained from the airway or the airway is visually evaluated to determine a diagnosis. Diagnostic bronchoscopies are performed when the following indications are observed (including, but not limited to) tumors or bronchial cancer, obstructions or narrowed airways, inflammation, chronic cough, or an abnormal chest x-ray. To obtain tissue samples from the airway, physicians use specialized devices, which pass through a channel within the bronchoscope. These tools can include forceps, needles, brushes, etc. The sample is then sent to pathology to obtain a conclusive diagnosis.

Therapeutic bronchoscopies are performed to eliminate or minimize a problem that is occurring within the airways and lungs. These may include, but are not limited to, the removal of foreign bodies, mucus, blood, or polyps (growths) to clear airways, to control bleeding, for laser therapy or brachytherapy (radiation treatment) for bronchial tumors, or for stent placement (a device used to keep the airways open).

How Bronchoscopy is Performed

Bronchoscopy can be performed with either a rigid or flexible bronchoscope. Flexible bronchoscopy can be performed under conscious sedation as an outpatient procedure.³ During flexible bronchoscopy, a thin, narrow tube is passed through the nose or mouth, and then through the larynx (voice box), trachea (windpipe), bronchi (large airways to the lungs), and bronchioles (smaller branches of the bronchi).²

Rigid bronchoscopy is performed with a straight, hollow, metal tube with a uniform diameter throughout its length, commonly under general anesthesia.⁴ Doctors perform rigid bronchoscopy less often today, but it remains the procedure of choice for removing foreign material and for several other therapeutic treatments, and also becomes useful when bleeding interferes with visualization.³

History of Bronchoscopy⁴

Gustav Killian was the first to look into the lower airways using a rigid bronchoscope in 1897, used for the removal of a foreign body from the airway. Until this point, patients would fall chronically ill after aspirating a foreign body, resulting in a high mortality rate for this condition. The only option for the patient would be to undergo an invasive surgical procedure to remove the foreign body, but only in the case that extensive scar tissue had developed. For the next 70 years, the rigid bronchoscope became the sole instrument available for diagnostic and therapeutic procedures in the airway.

¹ Callaway Lane, Carol (RN, MSN ACNP-BC). "Endobronchial Ultrasound Guided Bronchoscopy: New Techniques in Daily Practice." *EndoNurse*. December 2008.

² MUSC Health. "Bronchoscopy." Medical University of South Carolina. 2009. Accessed July 16, 2009. <<http://www.muschealth.com/gs/TandPContent.aspx?PageID=P07743>>

³ American Medical Association. *Complete Medical Encyclopedia*. "Bronchoscopy." Random House Reference. New York, New York; 2003.

⁴ Beamis, J.F. Bolliger C.T. and P.N. Mathur (eds). "Modern Use of Rigid Bronchoscopy." *Interventional Bronchoscopy*. Basel Karger 2000; Vol 30.

The first flexible bronchoscope was developed and introduced nearly 35 years ago by Shigeto Ikeda, revolutionizing the field of bronchoscopy and becoming the standard instrument used for diagnostics. Flexible bronchoscopy is now used in nearly all diagnostic airway procedures and has proven useful for many therapeutic uses as well.

Bronchoscopy has changed significantly since its first use with the rigid bronchoscope, to the advancements of flexible bronchoscopy, to new technologies which have been developed in the recent past, enabling physicians to diagnose lung cancer and other diseases earlier and treat their patients more effectively in a minimally invasive manner. These advancements include, but are not limited to, needle aspiration, fluorescence, narrow band imaging, endobronchial ultrasound, virtual bronchoscopy, laser treatment, brachytherapy, airway dilation, airway prostheses (stenting), phototherapy, and electrocautery.⁵ In addition, bronchoscopy has played an indispensable role in the diagnosis and treatment of pediatric lung diseases.

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⁵ Prakash, Udaya, BS, MD, FCCP, "Advances in Bronchoscopic Procedures." CHEST. American College of Chest Physicians. Vol 116; 1999.