Embaba Chest Hospital Bronchoscopy Experience: A Study of Cases needed fiberoptic Bronchoscopy in the Period from January 2016 till April 2017

Thesis

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Introduction

Bronchoscopy is a procedure to visualize the tracheobronchial tree ***(Icon Health Publications, 2004).***

There are three types of bronchoscopy: rigid, flexible and virtual bronchoscopy. Flexible bronchoscopy is the most common type of bronchoscopy. It visualizes the trachea, proximal airways and segmental airways out to the third generation of branching and can be used to sample and treat lesions in those airways. Flexible bronchoscopy is generally performed in a procedure room with conscious sedation. The flexible bronchoscope consists of a flexible sheath that contains cables that allow the tip of the bronchoscope to be flexed and extended, fiberoptic fibers for transmitting endobronchial images, a light source and a working channel ***(Feinsilver et al., 1995).***

Bronchoscopy is a common indication for collection of various types of respiratory samples. These include washing, bronchoalveolar lavage, brushings and bronchial biopsy. Studies have documented that a combination of histological and cytological techniques have significantly increased the overall diagnostic yield of diagnostic bronchoscopy ***(Prakash, 2002).***

The most common indications for flexible bronchoscopy:

- Mass/nodule/ suspicious lesion/cancer.
- Hemoptysis.
- Pneumonia/infection.
- Diffuse/interstitial disease in a non-immunocompromised patient.
- Diffuse infiltrative pulmonary disorders in immunocompromised patients.
- Unexplained cough or wheezing.
- Persistent purulent sputum of unknown etiology.
- Trachea/ stridor/ vocal cord paralysis/hoarseness.
- Superior vena cava syndrome.
- Extrapulmonary symptoms with frequent pulmonary and bronchial involvement
- Thermal/chemical injury.
- Suspected tracheo-esophageal fistula.
- Abnormal radiographic findings.
- Evaluation of abnormal pulmonary function testing like central airway stenosis.
- To evaluate complications of artificial airway.
- Tracheobronchial obstruction.
- Progressive or non- resolving pneumonias.
- Complications in lung transplant recipients.

Specific Indication in the ICU:

- Ventilator associated Pneumonia.
- Endotracheal tube placement confirmation.
- Airway trauma, Bronchial stump dehiscence.
- Smoke and Inhalational injury.
- Double lumen intubation for independent lung ventilation.

(Joos et al., 2006)

The main risks from bronchoscopy are:

- Bleeding from biopsy sites and Infection.
- There is also a small risk of:

Arrhythmias, breathing difficulties, fever, heart attack in people with existing heart disease, low blood oxygen, pneumothorax and sore throat. In the rare instances when general anesthesia is used, there is some risk for: Muscle pain, change in blood pressure, slower heart rate, nausea and vomiting ***(Kupeli et al., 2010).***

Fiberoptic bronchoscopy was found to be extremely useful in finding specific etiology of various lung diseases ***(Bhadke et al., 2010).***

Aim of the Work

The aim of the present work is to study the indication and outcome of flexible fiberoptic bronchoscope in bronchoscopy unit, in Embaba Chest Hospital in the period from January 2016 till April 2017.

Chapter (1)

Fiberoptic Bronchoscope

Bronchoscopy is a procedure to visualize the tracheobronchial tree ***(Icon Health Publications, 2004)***.

In 1897, Gustav Killian, the "father of bronchoscopy," first viewed the trachea and main bronchi through the larynx via a rigid, hollow tube. He quickly realized that the utility of his new invention was not limited to visualizing the airways. Later that same year, he removed a bone lodged in the right main bronchus of one of his patients. Bronchoscopy and interventional pulmonology were born. Modifications and improvements to the bronchoscope were made over the years. In 1904, Chevalier Jackson equipped the bronchoscope with an electric light source at the distal end and also added a suction channel. Early in the 1960s Shige to Ikeda devised a means to replace the small electric bulb with glass fibers capable of transmitting brighter light from an outside source. The device worked so well that he requested Machida and Olympus to create a prototype for a flexible fiberscope using fiberoptics ***(Becker et al., 2000)***.

He presented the first flexible bronchoscope at the 1966 International Congress on Diseases of the Chest in

Copenhagen. Following his success, he continued to strive to make further improvements to the scope. At the end of the 1980s, Asahi Pentax replaced the fiber optic bundle with a charge-coupled sensor at the tip of the scope. This video bronchoscope allowed the bronchoscopist to look at a monitor screen instead of through the eyepiece of the scope ***(Miyazawa, 2000)***.

Variants —Several variants of traditional flexible bronchoscopy exist:

- **Endobronchial ultrasound (EBUS)** involves a flexible bronchoscope that has an ultrasound probe built into its distal end. It provides real-time ultrasound images of the tissue adjacent to the airway, facilitating transbronchial needle aspiration of enlarged lymph nodes or masses.

- **Electromagnetic navigation bronchoscopy (ENB)** uses a special catheter with a sensor probe that is inserted through the working channel of a regular flexible bronchoscope. The probe is then steered through the distal airways beyond the third generation of airways, guided by an electromagnetic guidance system. This allows peripheral lung masses or abnormal areas to be sampled even if they cannot be accessed by regular bronchoscope directly.

- **Ultrathin bronchoscopy** is performed with a bronchoscope that has an external diameter of only 2.8 mm, allowing examination beyond the third generation of airways.

- **Confocal Bronchoscopy –** A confocal probe is inserted through the working channel of the bronchoscope to illuminate and examine the microscopic structure of the airways and lung parenchyma in real time.

- **Fluorescence bronchoscopy** facilitates the identification of precancerous or abnormal airway lesions and is reviewed separately ***(Simoff et al., 2006)***.

Preparation for bronchoscopy:

The goal of patient assessment for any invasive procedure such as FOB is to forewarn of potential complications or to identify complications that occur as a result of the procedure. Possible bronchoscopic complications may include a variety of respiratory, cardiac, and other conditions. Reported respiratory complications include hypoxia, hypercapnea, laryngospasm, bronchospasm, pulmonary edema, aspiration, airway obstruction, pneumomediastinum and pneumothorax ***(Facciolongo et al., 2009).***