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INDICATIONS AND OUTCOME OF FLEXIBLE BRONCHOSCOPY: A ONE YEAR RETROSPECTIVE STUDY IN TERTIARY CARE HOSPITAL

Pulmonary Medicine

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ABSTRACT

Objective: To study the indications and outcome of flexible bronchoscopy done at MGM Medical College and Hospital, a tertiary hospital in Maharashtra.

Methods: A retrospective study of fiberoptic bronchoscopy (FOB) was performed at MGM Medical College and Hospital, Aurangabad,Maharashtra during the time period of January – December 2018. Bronchoscopy was performed and collection of bronchial washing, bronchial biopsy, transbronchial needle aspiration and endobronchial intubation was done.

Result: The main indication for doing bronchoscopy was suspected cases of pulmonary tuberculosis followed by suspected cases of lung malignancy.Out of 136 patients, pulmonary tuberculosis was suspected in 24 patients and bacterial/fungal infections in 28 cases for which bronchial washings were taken and MTB was detected among 20 patients (80.30%), BAL culture-sensitivity reported positive for 37.73%, fungal element was found in 9.4% .33 patients were suspected cases of lung malignancy for which bronchial biopsy was done (24.26%), of which both squamous cell carcinoma and adenocarcinoma were found to be 27.27% each, 21.27% were non-small cell carcinoma. 33% of the patients were subjected to bronchoscopy for visualisation of the tracheo bronchial tree, 2.94% were for foreign body removal and 1.47% were for endobronchial intubation.

Conclusion: The optimal use of conventional bronchoscopy and its techniques in the hands of experienced respiratory interventionists, with the adherence of the international guidelines for performing these techniques has improved the diagnostic outcomes of those patients with the least morbidity and mortality, employing better therapeutic strategies and thus improving the overall management of those patients.

KEYWORDS

INTRODUCTION

Bronchoscopy is an endoscopic technique of visualizing the inside of the airways for diagnostic and therapeutic purposes. An instrument (bronchoscope) is inserted into the airways, usually through the nose or mouth, or occasionally through a tracheostomy. The German laryngologist Gustav Killian is attributed with performing the first bronchoscopy in 1897.[1] Killian used a rigid bronchoscope to remove a pork bone.Shigeto Ikeda invented the flexible bronchoscope in 1966.[2]In the recent day practice, flexible bronchoscopy has become perhaps the most commonly employed invasive procedure in the practice of respiratory medicine.

A flexible bronchoscope is longer and thinner than a rigid bronchoscope. It contains a fiberoptic system that transmits an image from the tip of the instrument to an eyepiece or video camera at the opposite end. Using Bowden cables connected to a lever at the hand piece, the tip of the instrument can be oriented, allowing the practitioner to navigate the instrument into individual lobar or segmental bronchi. Most flexible bronchoscopes also include a channel for suctioning or instrumentation, but these are significantly smaller than those in a rigid bronchoscope.

Flexible bronchoscopy causes less discomfort for the patient than rigid bronchoscopy, and the procedure can be performed easily and safely under moderate sedation. It is the technique of choice nowadays for most bronchoscopic procedures.

Indications

Diagnostic:

- To view abnormalities of the airway
- To obtain tissue specimens of the inside the lungs by biopsy, bronchoalveolar lavage, or endobronchial brushing.
- To evaluate a person who has bleeding in the lungs, possible lung
- cancer, a chronic cough, or sarcoidosisTherapeutic
- To remove secretions, blood, or foreign objects lodged in the airway
- Laser resection of tumors or benign tracheal and bronchial strictures
- Stent insertion to palliate extrinsic compression of the tracheobronchial lumen from either malignant or benign disease processes
- For percutaneous tracheostomy
- Tracheal intubation of patients with difficult airways is often performed using a flexible bronchoscope.

Flexible bronchoscopy can be performed under sedation or general anesthesia. Relative contraindications to sedation include history of severe gastroesophageal reflux, history of aspiration, respiratory compromise, and extreme anxiety. Topical anesthesia is useful as well with lidocaine being the anesthetic of choice.[4] Strategies for topical anesthesia include transtracheal injection, nebulized solutions, and topical application to the posterior pharynx either by having the patient gargle viscous lidocaine or by direct spray to the mucosa of the larynx and trachea.[3,4,5]

OBJECTIVE:

In this study patients admittedat MGM Medical College and Hospital, a tertiary hospital in Maharashtra during January to December 2018 with suspicion of pulmonary tuberculosis, lung malignancy, haemoptysis,chronic dry cough, foreign body in throat were subjected to bronchoscopy via FOB and their outcomes were studied.

METHODOLOGY:

This is a retrospective study of fiberoptic bronchoscopy(FOB) performed in MGM Medical College and Hospital, Aurangabad, Maharashtra during the period january2018 to December 2018.

Inclusion criteria: Patients of all age groups coming with complaints of chronic dry cough despite of medications, sputum negative for AFB, suspicious case of pulmonary tuberculosis, suspicious case of lung malignancy, haemoptysis under evaluation and foreign body inhalation who were willing to be part of this study were included.

Exclusion criteria: paediatric age group 0-12years old

A total of 136patients who underwent the procedure were studied. Pre-

bronchoscopy screening was done with history, physical examination,blood test, CT,PT, fresh chest X-ray, sputum smear for AFB. All FOBs were performed using 2% lignocaine spray by spraying in the oropharynx. Patients were instructed to be nil per orally for atleast 6-8 hours prior to procedure. Informed consent was taken. All bronchoscopic examinations were done using a 6mm video assisted flexible bronchoscope (BF-IT150) ,Olympus, Tokyo, Japan) by experienced respiratory interventionists.

In majority of patients flexible bronchoscope was introduced trans-nasally. The patient was made to lie supine on the table and the operator standing at the head end of the patient. The nasopharynx, larynx, vocal cord, trachea and the transbronchial tree were visualised upto $4^{th}$to 6^{th} generation under direct vision.

MATERIALS:

During the bronchoscopic procedure, diagnostic materials were obtained by bronchial washings(BW), endobronchial or transbronchial lung biopsy(TBLB) and transbronchial needle aspiration(TBNA),as decided by the bronchoscopist on a case-by-case basis.

Bronchial washings:

were obtained with a lavage with 20ml normal saline, subsequent aspiration into suction tubing. Specimen was sent in a sterile container for cytological examination, and for gene expert in suspected cases of pulmonary tuberculosis.

Biopsy:

For tumours which were visible through the bronchoscope and located, biopsy wasn't difficult. For tumours in difficult location, the tip of bronchoscope was flexed as far as possible. Biopsy material obtained was transferred into a container containing 10% formalin and sent for histopathological examination.

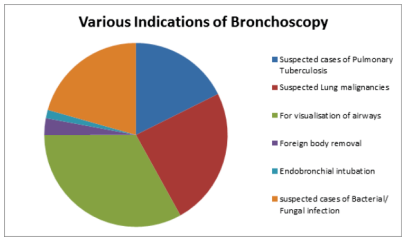
Trans bronchial needle aspiration(TBNA):

It was performed prior to other procedures such as brushings, washing and bronchial biopsy to avoid contamination. All the specimens were interpreted by cytopathologist. All the subjects were kept under constant supervision for post bronchoscopy complications ,for 4hrs following the procedure.

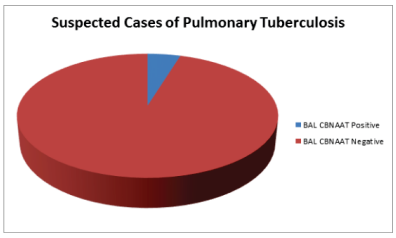
RESULTS:

Out of 136 patients who underwent bronchoscopy,the indications for doing bronchoscopy were suspected cases of pulmonary tuberculosis-24 cases(17.6%),suspected cases of bacterial /fungal infection were 28(20.58%), suspected cases of lung malignancy were 33(24.26%),for visualisation of airways(due to complaints of chronic dry cough, haemoptysis, hoarseness of voice) were 45(33%), for foreign body removal were 4 cases(2.94%), for endobronchial intubation were 2 cases(1.47%).

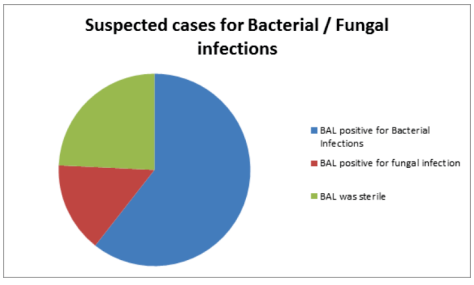
Suspected cases of pulmonary tuberculosis (sputum negative for AFB), their bronchial washings were sent for gene expert and 20 cases reported to be positive for CBNAAT (80.30%). 28 cases were suspected for bacterial infection or fungal infection, their bronchial washings were sent for culture-sensitivity which reported with 60.6% positive results detecting the micro organisms and 5.15% were positive for fungal elements &24 .34% reported to be sterile. 33 cases were suspected for lung malignancy, of which 9 cases were reported to be squamous cell carcinoma(27.27%),9 cases reported to be adenocarcinoma(27.27%), 7 cases reported to be non- small cell carcinoma(21.27%) and remaining 24.24% reported to be inconclusive.



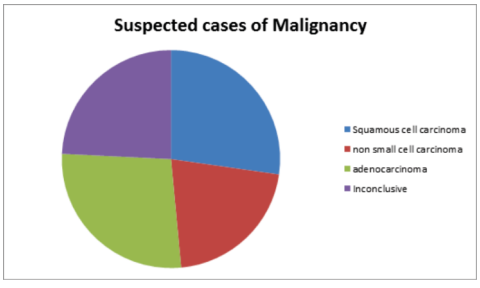
Out of 136 patients suspected cases of pulmonary tuberculosis were 24(17.6%), suspected cases of lung malignancy were 33(24.26%),for visualisation of airways were 45(33%),for foreign body removal 4(2.94%), for endobronchial intubation 2(1.47%), for suspected cases of bacterial/fungal infection were28(20.58%).



24 cases were suspected for pulmonary tuberculosis, of which 20 turned out to be BAL CBNAAT positive (83.30%) and remaining were negative for CBNAAT (16.66%).



28 cases were suspected for bacterial/ fungal infections out of which BAL positive forbacterial infections were 20(60.6%),fungal infections positive for 5(5.15%) and remaining were sterile (24.24%)



33 cases were suspected for lung malignancy,out of which 9 cases were reported to be squamous cell carcinoma(27.27%),7 reported to benon-small cell carcinoma(21.27%), 9 were reported to be adenocarcinoma of lung(27.27%) and 8 were inconclusive (24.24%) .

DISCUSSION:

Flexible bronchoscopy since its inception in 1966[6] has had an exponential growth in pulmonology and clinical medicine. The advantages of maneuverability, feasibility of wide spectrum of diagnostics and therapeutics, patient comfort and ease of conscious sedation has established flexible bronchoscopy as the most important weapon in a pulmonologists' armamentarium. It has not only helped in diagnosing pulmonary pathologies but has also helped in understanding the pathophysiology of some diseases.[7] Hence it is now an essential part of a pulmonology training program. With the evolution of pulmonology over the years, there has been a simultaneous evolution in the indications and applications of flexible bronchoscopy.

The flexible bronchoscope was created to diagnose lung cancer early due to increased involvement of upper lobes and inability to visualize upper lobes with the rigid bronchoscope.[6] Lung cancer was the indication behind its development and still is one of the commonest indications worldwide for flexible bronchoscopy.[8,9,10] Flexible bronchoscopy has a huge impact on the management of lung cancer. It helps in both diagnosing and staging lung cancer as well as palliation by debulking endobronchial lesions and treating airway stenoses by deploying metallic airway stents.[11,12]

Hemoptysis and pulmonary infections are the most common indications for a flexible bronchoscopy.[8,9,10] It is a useful tool in the evaluation of a non-resolving pneumonia. Bronchoalveolar lavage (BAL) helps in diagnosing pulmonary infections in both immunocompetent and immunosuppressed hosts.

A variety of airway pathologies are successfully treated with the help of these modalities. Successful endobronchial foreign body retrievals are also carried out using flexible bronchoscopy.[13]

The flexible bronchoscope has proven its worth outside the endoscopic suite in the operating rooms and the intensive care unit (ICU). Flexible bronchoscopy is considered as a gold standard for endotracheal intubation in securing airway in both operating room and the ICU.[14]

BAL aids in diagnosis of tuberculosis in smear-negative patients.[15,16] The feasibility of performing Gene Xpert for MTB/Rif on BAL makes it an important tool in diagnosis of multidrug-resistant tuberculosis and helps guide therapy.[17]

In this study, a retrospective analysis of 136 cases of flexible bronchoscopies was performed over a period of one year in MGM Medical College and Hospital,Aurangabad, Maharashtra. The commonest indications for bronchoscopy in our study was to visualise the airways, suspected cases of pulmonary tuberculosis, suspected cases of lung malignancies.

Our study shows 24 suspected cases of pulmonary tuberculosis,of which 80.30% turned out to be positive on BAL CBNAAT. This finding was also seen in a study done by Arshad Altaf Bachh et al.[18] This can be expected in a country like India where tuberculosis is a commonly encountered clinical condition and is considered in the differential diagnosis of various clinical presentations. 33 cases in our study were suspected for lung malignancy, of which 25 cases showed positive results75.75% (squamous cell carcinoma 27.27%, adenocarcinoma 27.27%, non-small cell carcinoma 21.27%). Similar study was done by Chopra S K et al[19] where of all the various methods of obtaining specimens, bronchial brushing and bronchial biopsy gave the highest percentage yield (67%).

CONCLUSION:

The utility of flexible bronchoscopy is ever growing and has certainly promoted from a luxury to a sheer necessity in pulmonary medicine.It is increasingly being utilized in diagnosis of wide array of respiratory disorders. It is fairly safe and can be performed as an outpatient procedure. The optimal use of conventional bronchoscopy and its techniques in the hands of experienced respiratory interventionists, with the adherence of the international guidelines for performing these techniques has improved the diagnostic outcomes of those patients with the least morbidity and mortality, employing better therapeutic strategies and thus improving the overall management of those patients.

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