



Original article

Bronchoscopic profile of various diseases in a rural care hospital

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Abstract

Flexible and rigid bronchoscopy is one of the most commonly employed procedures for diagnostic and therapeutic purposes in the field of otorhinolaryngology, pulmonary medicine, critical care medicine and anesthesiology. We put forward the results of a prospective observational study wherein 100 patients with different diagnosis underwent either flexible bronchoscopy or rigid bronchoscopy for diagnostic / therapeutic use at a rural medical set up.

Key words: Bronchoscopy, Diagnostic bronchoscopy, Foreign bodies, Therapeutic bronchoscopy

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Bronchoscopy both rigid and flexible is one of the most frequently performed invasive procedure in diagnosing disorders of lung, pleura and other parts of respiratory system along with its therapeutic use. Common conditions are pulmonary involvement by neoplasm, infections, diffuse lung diseases and airway problems such as foreign bodies. Advancements in technology coupled with reductions in their costs, bronchoscopy is now more easily available to doctors across various medical specialties for use and thus led to improvement in patient care.

Bronchoscopy has made tremendous progress in recent years. Gustav Killian (Father of Bronchoscopy) who removed an aspirated pork bone from the respiratory tree (bronchus) of a 63 year old farmer under local (cocaine) anesthesia in 1897 and is acknowledged for the same as performing first removal of foreign body from respiratory tract with the aid of bronchoscope. Chevalier Jackson is acknowledged and appreciated for the advances and thereby modernizing the procedure of bronchoscopy which helped reduce the mortality of

respiratory tract (tracheobronchial) foreign bodies removal from around more than 20% to approximately 2%. Modern anesthesia techniques with their improved safety profile, development of bronchoscopes with ventilating ports as well as advanced illumination and visualization techniques which were made available by the Hopkins telescope guided optical forceps have further diminished the mortality¹.

Apart from the more orthodox indications for interventional bronchoscopies, such as foreign body removal, clearance and aspiration of secretions, bronchoscopy nowadays is also used for inoperable stenosis of the central airways—benign or malignant².

In some clinical scenarios, rigid bronchoscopy is said to have an upper hand over flexible bronchoscopy. Side port ventilation makes it very feasible to administer general anesthesia in patients undergoing rigid bronchoscopy. In children, removal of foreign bodies and in adults, tracheal stricture dilatation and cryotherapy are indications for rigid bronchoscopy³.

Fibreoptics and flexibility have led to increasing use of flexible bronchoscopes in the diagnosis of pulmonary diseases and more so ever in lung malignancy from their introduction in clinical practice since 1960s. Along with its diagnostic utility, it has been brought into therapeutic use very widely because of technology advancements leading to development of Nd:YAG laser, cryotherapy, tracheobronchial stenting to name a few. With wide and increased acceptance and use of flexible bronchoscopy along with somewhat decreased level of training in rigid bronchoscopy seen over the recent past time, it is more than likely that its use will continue to widespread⁴.

Another important reason for bronchoscopy could be to obtain bronchoalveolar lavage (BAL) specimen which can be useful in diagnosis of not only bronchial malignancies but also cases of sputum smear negative pulmonary tuberculosis, bacterial pneumonia and hematological malignancies.

This purpose of this study was to see the pathological variations in the tracheobronchial tree in various respiratory diseases.

Materials and methods

This research study analysis on bronchoscopic profile of various respiratory diseases was carried out in department of Otolaryngology and Head & Neck Surgery at our institute after the approval of local institutional ethical committee over approximately 2 years period. Patients were explained about the study and appropriate written informed consent was taken either from patients or from their guardians of the patients who were minor.

We studied 100 patients of all ages and either gender who were referred to ENT department at our hospital for bronchoscopy and put forward their different characteristic in this prospective study.

There was no fixed disease criteria for patients subjected to bronchoscopy. Majority of patients subjected to scopy were from the outpatient department of ENT. Patients, who were having laryngeal and nasopharyngeal pathologies not completely visible by indirect scopies or having difficulty in indirect scopic examination itself, were also included.

All bronchoscopic procedures were elective (except for foreign body bronchus, where respiratory distress was present). Routine workup, including detailed ENT and respiratory examination, sputum examination (for cytology and AFB) and chest x-ray (posterior-anterior and lateral view) was performed for patients. Each patient was tested for

xylocaine sensitivity. Pre-anesthetic checkup wherever deemed necessary was carried out.

Fibreoptic bronchoscopy was carried out under topical-local anesthesia while rigid bronchoscopy was done under general anesthesia. In case of both rigid and fibreoptic bronchoscopy patient was given supine position and neck extended. While doing fibreoptic bronchoscopy, the entire respiratory tract from nasal cavity to segmental individual bronchus level was examined and findings noted. In case of rigid bronchoscopy, the rigid bronchoscope was passed through oral cavity. Wherever appropriate, samples were collected from the respiratory tract either for BAL or biopsies.

After the procedure all patients were observed in the postoperative recovery room for around two hours. The patients of flexible bronchoscopy performed under local anesthesia were then allowed to go, except those experiencing difficulty in breathing who were kept under observation in wards. Patients of rigid bronchoscopy were kept nil by mouth for six hours and then allowed food orally. They were also observed for difficulty in breathing.

The findings obtained on examination were recorded in predesigned proforma. The therapeutic measures that were taken and the complications that occurred were noted. Data was tabulated and analyzed in MS excel version 2007.

Results

This study was a prospective observational study at a medical college hospital in a rural area. Our study comprised of 100 patients, suffering from various respiratory diseases, who were referred to ENT department for bronchoscopy. The indications were diagnostic mostly but were also aimed at therapeutic intervention when required (e.g. removal of foreign bodies).

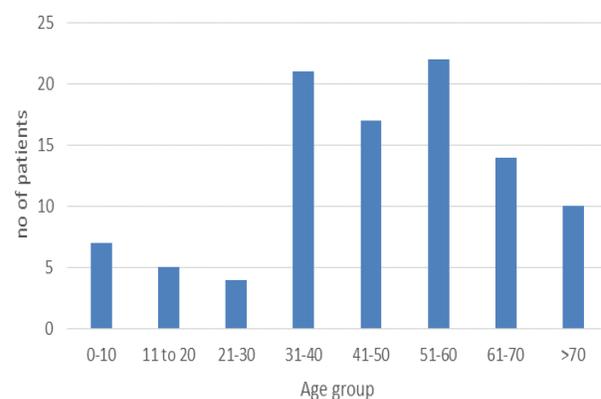


Fig 1. Age distribution of patients

The various patient and bronchoscopic parameters like demographic, indications for bronchoscopy, clinical features, radiological correspondence with bronchoscopy and patient's clinical condition and so on were noted down during the course of study and are presented here. Age and sex distribution is presented in figure 1 and 2. Chest radiographic findings and localization of foreign bodies is given in figure 3 and 4.

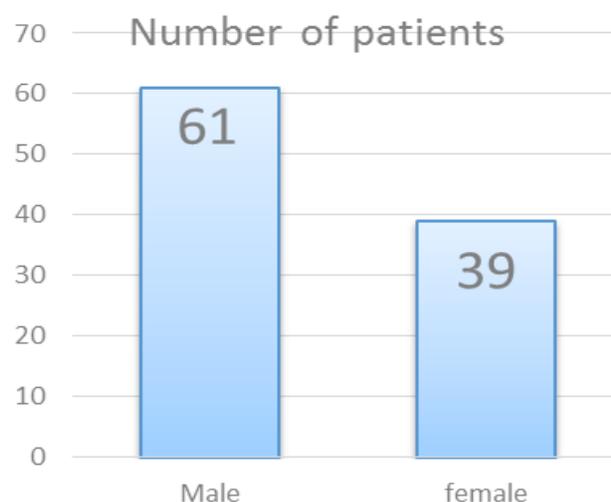


Fig 2. Sex distribution of patients

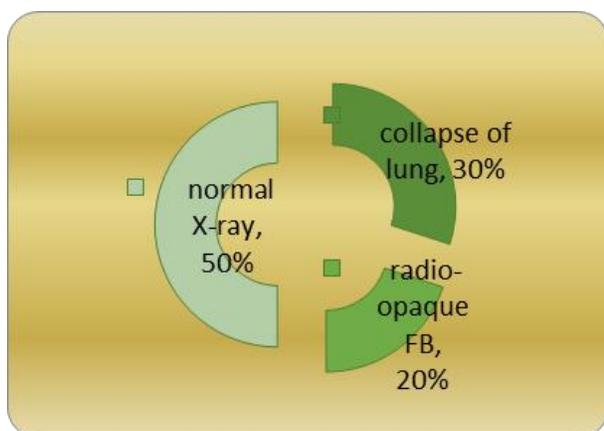


Fig 3. Radiological findings in patients with tracheo-bronchial foreign body

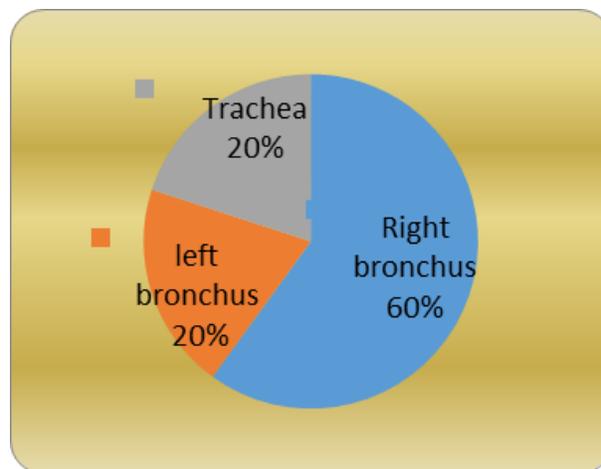


Fig 4. Site of lodging of foreign body

Table 1: Various indications of bronchoscopy (rigid and fibreoptic) (N=100)

Pre bronchoscopy diagnosis	n
Foreign body bronchus	10
Hoarseness of voice	10
Vocal cord palsy (idiopathic)	05
Pulmonary tuberculosis (sputum negative)	06
Hemoptysis (unexplained origin)	09
Pneumonia (non-resolving)	11
Pleural effusion (idiopathic)	08
Bronchogenic carcinoma	30
Lung abscess	03
Lobar collapse	03
Secondaries in neck (with occult primary)	05

The main indication of bronchoscopy, including both rigid and fibreoptic, was diagnostic. Bronchoscopy was carried out with certain clinical diagnosis (Table 1).

Table 2: Bronchoscopic appearance in patients with suspected bronchogenic carcinoma

Bronchoscopic abnormality	No.	No. of biopsies	Positive biopsies (% of no of biopsies)
Intraluminal growth	11 (23.3%)	08	4 (50)
Inflammation only	11 (36.6%)	05	1(20)
Extrinsic compression	02 (6.6%)	-	-
Normal findings	03 (16.6%)	-	-
Inconclusive	03 (16.6%)	01	00
Total	30	13	5 (38.4)

Discussion

We studied 10 cases of tracheobronchial foreign bodies, where the highest incidence was found in age group of 1-5 years with right bronchus being the main site of lodgment. In a prospective study carried out by Kaur et al¹ on fifty cases of tracheobronchial foreign bodies it was found that 60% of foreign bodies were aspirated in the age group of 1-3 years, which was almost similar to our observation. The probable reason for this observation is that the kids don't have dentition developed completely along with immature swallowing activity. Additionally these children explore their world by introducing objects into their mouth. This makes the children more vulnerable.

When examining 10 cases of hoarseness of voice whose diagnosis was inconclusive on initial investigations, we found 2 cases each of vocal cord growth/nodule/polyp. In 5 cases of unexplained vocal cord palsy, bronchoscopy showed tracheal compression because of questionable mediastinal mass in 3 cases.

Out of six patients of sputum negative pulmonary tuberculosis, inflammation of bronchial mucosa was most common finding and bronchoalveolar lavage (BAL) could diagnose three cases. Studies by Araz et al⁵ and Chan et al⁶ corroborate with our observation of bronchoalveolar lavage useful in giving high yield of definitive diagnosis of pulmonary Koch's even in sputum smear negative cases.

Bronchoscopy led to diagnosis in only 3 cases out of total 9 cases of hemoptysis with inconclusive x-ray chest findings. Inflammation was the most common finding in cases of non-resolving pneumonia, where we also performed bronchoalveolar lavage which was positive in 5 cases when subjected to culture.

No specific diagnosis could be made in patients with unexplained pleural effusion, while 2 out of 3 cases with malignant pleural effusions showed endobronchial tumor and extrinsic compression.

In 30 cases of suspected bronchogenic carcinoma, growth (endobronchial and extrinsic) could be seen in only in 13 cases, while biopsy was positive in 4 cases. 11 cases had inflammatory changes but only one patient amongst the inflammatory finding had positive biopsy. In one study by Jindal et al⁷ out of 612 patients who were subjected to bronchoscopy, intraluminal growth was found in 326 (53.3%) patients. Of this biopsy was taken in 226 patients and biopsy turned out to be positive in 163 cases (72.1%). This observation supported our

result and thus confirmed the efficacy of bronchoscopy in diagnosing lung cancer.

All the three cases of lung abscess showed inflammatory changes, while growth could be seen in one case. In 3 patients of lobar collapse, bronchoscopy revealed obstruction because of growth (extrinsic/ endobronchial) in 2 cases. 5 patients of occult primary with secondaries in neck underwent bronchoscopy as a part of pan-endoscopy; however bronchoscopy was inconclusive in all of these cases.

Complications occurred in 3 patients (3%) which were successfully treated. There were no deaths during the procedure. Thus we can say that bronchoscopy is a safe and reliable procedure when performed with due precautions.

Conclusions

From the above conducted prospective observational study we conclude that bronchoscopy is an important tool for both diagnostic and therapeutic purpose in patients with various upper and lower respiratory pathologies including tracheobronchial foreign body impaction; laryngeal and nasopharyngeal pathologies which may be difficult to visualize by routine indirect laryngoscopy; and hoarseness of voice.

Bronchoscopy can aid in the management of pulmonary Koch's, non-resolving pulmonary infections, lung abscess, lung collapse as well. It can play an important role in the diagnosis of lung malignancies as well as for evaluation of patient's with secondaries in neck with occult primary.

Bronchoscopy is a reliable technique for investigation of respiratory diseases with minimal risk of complications when performed by experience operators. However we feel that indiscriminate use of bronchoscopy should not be there and additional studies are needed to further delineate the proper role of bronchoscopy with large sample size.

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