

Analysis of Fiberoptic Bronchoscopy Findings in Respiratory Unit at Ba" Aquaba Teaching Hospital in 2020-2021

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Abstract: Background: Fiberoptic bronchoscopy is a safe and useful diagnostic and therapeutic tool for the management of pulmonary diseases. **Aim of the study:** To analyse the outcome of fiberoptic bronchoscopy in the respiratory unit at Ba" aquaba teaching hospital in 2020-2021. **Patients and Methods:** A retrospective study was done to find out the demographic profiles, indications, bronchoscopic findings, diagnosis, and complications of the patients who underwent bronchoscopic examination. 100 patient underwent bronchoscopies in the respiratory at Ba" aquaba teaching hospital in 2018-2019. **Results:** Amongst the 100 patients where 60% of them was male and 40% was female, 59% of the total number was non-smoker, 30% were currently smoker, and ex-smoker of 11 % were. Most common clinical presentation of the patients was Cough (56%), followed by dyspnea (34%). the commonest indication of bronchoscopy was radiological opacity found in 78 % of patients. The most common finding on bronchoscopy was endobronchial growth found in about 29% of patients. Malignancy was seen in 40% of cases, while Tuberculosis was seen in 17%. **Conclusion:** The fiberoptic bronchoscopy is relatively safe, and quickly done under local anaesthesia but also can be associated with major complications such as cardiac arrest as in our study.

Keywords: The fiberoptic bronchoscopy; local anaesthesia; and pulmonary diseases.

INTRODUCTION

Bronchoscopy is the procedure of passing a telescope or camera into the trachea to inspect the large and medium-sized airways [Stephen, C. *et al.*, 2014]. It may be performed with a flexible scope, using local anesthetic with or without sedation, favored by physicians, or under a general anesthetic with a rigid scope, used mostly by cardiothoracic surgeons. Airways can be visually inspected, samples taken, and therapeutic procedures can perform [Taha, A.Y, 2017]. Dr. Azhar K Kassab, a Cardiothoracic & Vascular surgeon is credited for introducing FOB to Iraq. Like other new technologies and procedures, the FOB was not readily welcomed and accepted by thoracic surgeons at that time who were familiar with the traditional rigid bronchoscope and have questioned the usefulness of the new bronchoscope compared with the old version [Garg, B, 2013]. However, FOB rapidly proved its benefits, and more and more trainee doctors learned and mastered its use. Dr. Kassab [Al obaidy, M.W] declared that he had learnt the procedure when he was a surgical resident at Royal Brompton Hospital, London in 1974. In 1976, Dr. Kassab returned to Iraq and did the first FOB in Basra Republic Hospital, south of Iraq. Two years later, he moved to Baghdad and started doing FOB extensively in Ibn-Alnafis [Al obaidy, M.W. *et al.*, 2005] Teaching Hospital and also in his private

clinic (starting at 1984) It is of interest to note that the first patient bronchoscoped by Dr. Azhar Kassab in Basra at 1976 [Abdul Redha, A.K.K. *et al.*, 2004] was a man with chronic cough following inhalation of a small metallic coin four years earlier. FOB revealed a partial obstruction of the right bronchial tree by a dark-colored 25-fill coin which was successfully removed by the FOB without needing the rigid bronchoscope. Machida [Al obaidy, M.W. *et al.*, 2017] 6-mm diameter FOB was introduced through the nose. The coin was firmly held by a grasping crocodile-jaw foreign body forceps. The bronchoscope together with the forceps grasping the coin was then slowly withdrawn to the mouth. The coin was then spat out of the mouth and the bronchoscope was pulled from the nose. This includes the trachea, left and right main bronchi, and bronchus intermedius [Hassan, G. *et al.*, 2002]. They have horseshoe-shaped cartilages, 16-20 in the trachea, 9-12 in the left main bronchus, 6-8 in the Right main bronchus, and 4-6 in the bronchus intermedius. In the trachea [Peter, S, 1993], the posterior wall of the bronchus, which is free of cartilage crescents, has a large amount of smooth muscle and is referred to as the membranous portion. This includes the lobar and segmental bronchi. The cartilage crescents disappear and during to intermittent plates of cartilage at the point of

transition [Oho, K. *et al.*, 1980]. The layers of elastic fibers between the mucosa epithelium and the submucosa are gradually replaced by smooth muscle, which extends in, rings surrounding the entire Circumference of the bronchus. Grossly the elastic fiber bundles appear as ridges running in the longitudinal direction. Sometimes the best chance of reaching a diagnosis bronchoscopically when no intraluminal lesion is found is to obtain biopsies from enlarged lymph nodes that are obviously distorting bronchi [Jackson, C. *et al.*, 1950; Ikeda, S, 1970]. Transbronchial needle aspiration is the safest technique here, through either the rigid or flexible bronchoscope particularly if confined to the widened carina. Bronchoscope provides one of the safest ways of obtaining small biopsies of the lung parenchymal. It helps in elucidating diffuse diseases which have defied diagnosis by other means e.g., pneumocystis carini [Newton, D.A. *et al.*, 1979; Abal Area, J. *et al.*, 1977] infection in immunosuppressed patients [Hansen, R. *et al.*, 1986]. The precautions that should be taken in this procedure are to avoid hemorrhage and reduce its risk by checking the blood urea, platelet count, and clotting factors, which should all be normal [Jindal, S.K. *et al.*, 1985]. Also, the blood group must be known. Sometimes instillation of 10 ml of 1/50000 adrenaline solution into the peripheral area to be biopsied and also a poor endobronchial biopsy may be done to reveal unsuspected poor hemostasis [Cohen, B.H. *et al.*, 1977]. Sometimes fluoroscopy is a valuable aid to control the placement of the biopsy instrument [Hsiegh, Y.C. *et al.*, 1981]. This study aims to analyze the outcome of fiberoptic bronchoscopy in the respiratory unit at Ba²aquba teaching hospital in 2020-2021.

PATIENTS AND METHODS

100 patients from those who performed fiberoptic bronchoscopy in the respiratory unit at Ba²aquba teaching hospital were selected and a retrospective study was done from January 2020 to April 2021. Detailed clinical history, physical examination, and routine investigations were carried out in all the patients. All of them were subjected to sputum examination (Acid Fast Bacilli (AFB) staining, Gram staining, culture/sensitivity, malignant cells), haematological examination, and coagulation profile. Contraindications, if any were ruled out, patients who refuse the procedure at the time of

Bronchoscopy are excluded, and those with the saturation of about (90%-91%) not increased with O₂ were also excluded to avoid the risk of further desaturation during the procedure. Chest X-rays in both PA and lateral views and CT scans were obtained in all the patients before the procedure to define the location of the lesion. PFT was performed in some cases.

Before the procedure all the patients were informed about the procedure steps then legal consent had taken from each patient. Most common indications were radiological opacity 78% followed by cough 14% & haemoptysis 8%.

Flexible bronchoscopy was performed with (STORZ flexible bronchoscope) through trans nasal route, sedation was not performed to avoid its side effects. Topical anaesthesia (xylocaine) was used. O₂ supplementation were given through nasal cannula at a concentration of 10 L/min for some patients when needed.

Oxygenation was monitored throughout the procedure with pulse oximetry, and blood pressure and pulse rate were also monitored. Appropriate samples such as bronchoscopic brushing and biopsy were obtained depending on the lesion after a thorough evaluation of the endobronchial tree. Samples were subjected to cytology and histopathology depending upon the clinical history and bronchoscopic findings. The data was analysed using Statistical Package for Social Sciences (SPSS) version 25. The data is presented as mean, standard deviation, and ranges. Categorical data is presented by frequencies and percentages.

RESULTS

The distribution of study patients by socio-demographic characteristics is shown in Figures (1 and 2) and Table (1). Study patients' age was ranging from 29 – 82 years with a mean of 53.2 years and a standard deviation of ± 11.42 years. The highest proportion of study patients was aged ≥ 60 years (53%). (Figure 1)

Regarding gender, the proportion of males was more than females (60% versus 40%) with a male-to-female ratio of 1.5:1. (Figure 2)

We noticed that 59% of study patients were non-smokers. (Table 1)

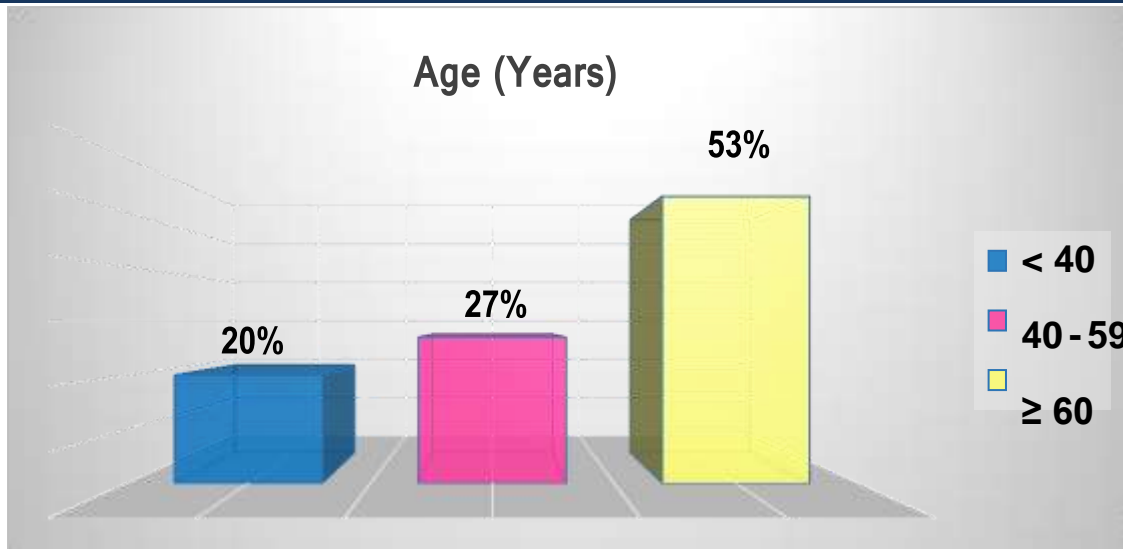


Figure 1: Distribution of study patients by age

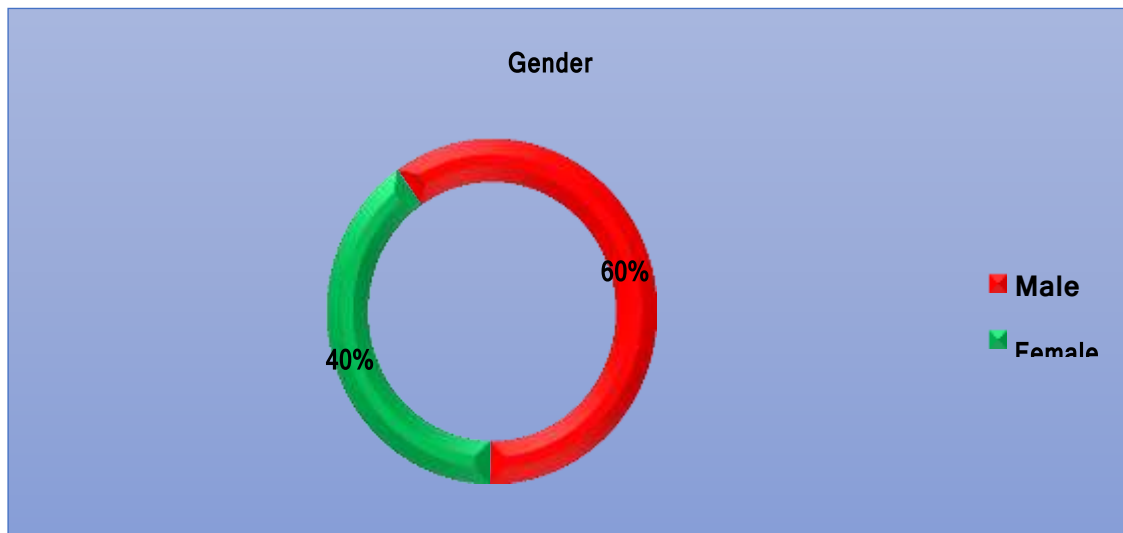


Figure 2: Distribution of study patients by gender

Table 1: Distribution of study patients by smoking status

Smoking status	No. (n= 50)	Percentage (%)
Non-smoker	59	59.0
Current smoker	30	30.0
Ex-smoker	11	11.0

Figure 2 shows the clinical presentation of study patients. It was obvious that the most common

symptom was cough (56%) followed by dyspnea (34%).

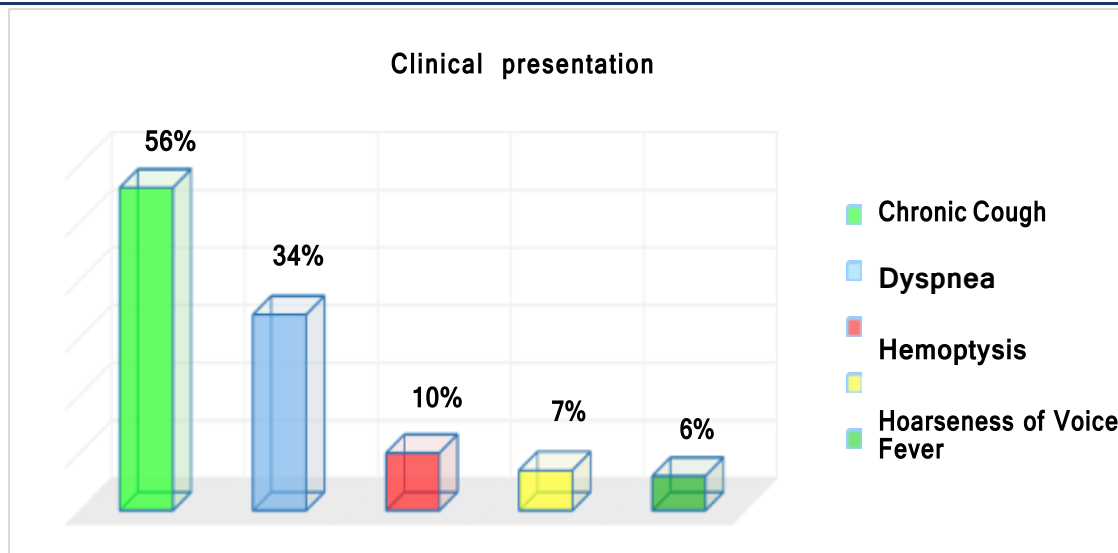


Figure 3: Signs and symptoms of study patients

The distribution of study patients by bronchoscopic findings is shown in Table (2). In this study, no pathology was detected in 48% of

patients, while endobronchial growth was seen in 29% of patients.

Table 2: Distribution of study patients by bronchoscopic findings

Bronchoscopic Finding	No. (n=100)	Percentage (%)
Normal	46	46.0
Endobronchial growth	29	29.0
Abnormal mucosa	16	16.0
Widening of carina	5	5.0
Vocal cord palsy	4	4.0

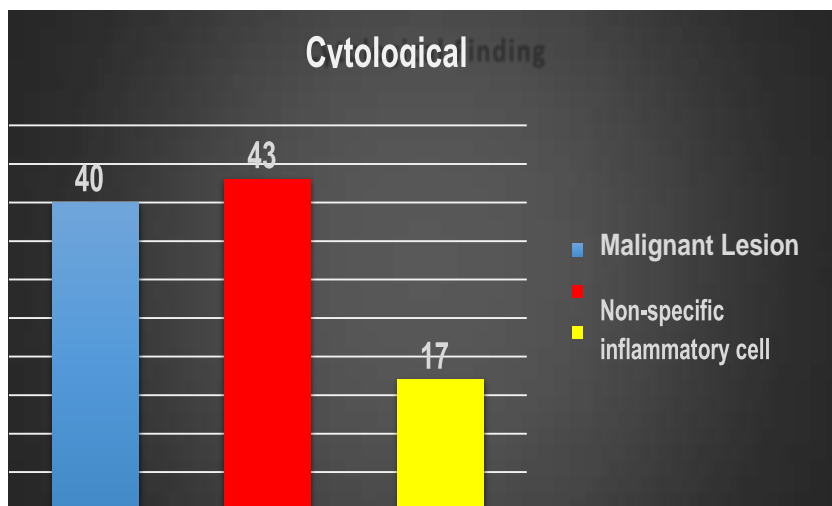


Figure 4: Results of cytological examination of bronchial wash and post-bronchoscopy sputum

Table 3 shows the histopathological findings. We noticed that 18% of cases was diagnosed as

squamous cell carcinoma.

Table 3: Biopsy findings

Histopathological findings	No. (n=29)	Percentage from NO. of growth (%)
Squamous Cell Carcinoma	18	62.0
Adenocarcinoma	7	24.1
Small Cell Carcinoma	4	17.2

Regarding complications of fiberoptic bronchoscopy, Table 4 shows that 60% of study patients didn't complain from any complication

regarding the procedure, while 21% of the patients suffered from bleeding from the nose.

Table 4: Complications of fiberoptic bronchoscopy

Complication	No. (n= 100)	Percentage (%)
No Complication	60	60.0
Bleeding from the nose	21	21.0
Hemoptysis	8	8.0
Hypoxia	7	7.0
Bronchospasm	3	3.0
Cardiac arrest	1	1.0

DISCUSSION

In our study, the cough was the commonest clinical presentation (56%) which is similar to an Iraqi study conducted by Muhammed, W. *et al* (24), and an Indian study conducted by Prakash UB as they also found that chronic cough is the main presenting symptoms that make the treating physician arranged for bronchoscopic examination.

Radiological opacity was the commonest indication for performing bronchoscopy (78%), it correlated with an Iraqi study conducted by Muhammed W. and an Indian study conducted by Jindal where they reported in their study that radiological opacity is the main indication for bronchoscopic examination to explore the nature of this opacity and reaches the final diagnosis. The second indication was unexplained chronic cough (14%) of patients followed by hemoptysis (8%). [Augusseau, S. *et al.*, 1978]

The most common finding in bronchoscopy was endobronchial growth in (29%) of patients similar to an Iraqi study of Muhammed W. where they found that endobronchial growth also was the common finding (29.5%), in all of these patients, an endobronchial biopsy was taken and sent for histopathological examination. Abnormal mucosa was seen in (16%) of patients and Bronchial brushings were done for them by use of a stiff-bristle disposable brush. Widening carina was seen in (5%), vocal cord palsy in (4%) and bronchoscopy was normal in the remaining (46%). The fiberoptic bronchoscopy is useful to determine operability because these patients are considered in operable.

Bronchial wash and post-bronchoscopy sputum collection were done for all the patients and sent for cytological examination and acid-fast bacilli staining. The bronchial wash material was obtained from the bronchial tree by instilling 30-50 ml of isotonic saline and re-aspirating it.

On cytological examination, the malignant cell had been detected in (40%), acid-fast bacilli had been detected in (17%) and non-specific findings were in the remaining (43%). The result of the current study regarding histopathological and/or cytological examination reveals that 40% had lung neoplasm and 60% had non-neoplastic laboratory results, this is comparable with the study of Muhammed W. found (29.5%) neoplastic and (70.5%) cases were a non-neoplastic disease. [Augusseau, S. *et al.*, 1978]

Out of 60 patients with the non-neoplastic lesion, tuberculosis was confirmed in 17 patients. In patients who were diagnosed with lung tumors, squamous cell carcinoma was the commonest histological type (18%) followed by adenocarcinoma (7%) while small cell carcinoma (4%) similar to many Iraqi studies like Abdul Redha, K. *et al.*, and Muhammed, W. [Popovich, J. *et al.*, 1982]

The remaining cases 43 patients from those with non-neoplastic disease included in our study, the laboratory results reveal non-specific findings, so according to that, we are in strong need to more advanced bronchoscopic techniques to solve the problem of diagnosis of this category of patients like transbronchial biopsy (TBB), endobronchial ultrasound (EBUS) and transbronchial needle aspiration (TBNA).

The safety of FoB by our study was proved as that 60% of patients were not showed any complications and just 21% had bleeding from the nose, 3% had hemoptysis, 7% had hypoxia, 3% had bronchospasm and 1% had cardiac arrest incomparable with many Iraqi studies like Muhammed W. and similar to an Indian study of Hassan, G., Khan, G.Q, Tanveer, M, *et al.*, where they report a mortality rate of 1%. [Kalra, S. *et al.*, 1989]

CONCLUSION

The fiberoptic bronchoscopy is quickly done under local Anesthesia but it can be associated with major complications such as in our study.

It has value in the diagnosis of TB, in patients with pulmonary infiltrates with negative sputum.

We recommend the use of fiberoptic bronchoscopy in the diagnosis of pulmonary diseases because it is an effective and relatively safe procedure.

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