

# Evaluation of Bronchoscopy Complications in a Tertiary Health Care Center

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**Background:** Bronchoscopy is a technique of visualizing the inside of the airways for diagnostic and therapeutic purposes. This study was performed to determine the complications of bronchoscopy in a tertiary health-care center.

**Materials and Methods:** This study had as descriptive cross sectional design. Four hundred adult patients between 16 to 85 years, who underwent bronchoscopy with a same method and same device and had no underlying disease, were consecutively enrolled.

**Results:** Bronchoscopy complications were seen in 13 patients (3.25%) including bleeding (four cases), pneumothorax (three cases), collapse (four cases), and infection (two cases). There was no association between complications and age, sex, bronchoscopy indications and findings ( $P > 0.05$ ).

**Conclusion:** According to the obtained results, it may be concluded that bronchoscopy can be performed safely whenever indicated. Complications occurred were minor and self limiting.

**Key words:** Bronchoscopy, Complication, Frequency

## INTRODUCTION

Bronchoscopy is a technique of visualizing the inside of the airways for diagnostic and therapeutic purposes (1,2). There are three types of bronchoscopy: rigid, flexible, and virtual bronchoscopy. Flexible bronchoscopy is the most commonly performed type of bronchoscopy (3). 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 (4,5).

Besides the risks associated with the drug used, there are also specific risks related to the procedure (6). A rigid bronchoscope can scratch or tear airways or damage the

vocal cords (7). The risk of flexible bronchoscopy is limited. Complications from fiberoptic bronchoscopy remain extremely low. Although most patients well tolerate bronchoscopy, a brief period of observation is required after the procedure (6,7). Most complications occur early and are readily apparent at the time of the procedure (7). The patient should be assessed for respiratory difficulty (stridor and dyspnea). The patient will be hospitalized if there occurs any bleeding, air leakage (pneumothorax), or respiratory distress (6,7). The complications, although rare, are important and should be prevented to improve the quality of the procedure. Accordingly, this study was performed to determine the complications of bronchoscopy in a tertiary health-care center.

## MATERIALS AND METHODS

This study had a descriptive cross-sectional design. Four hundred adult patients between 16 to 85 years, who underwent bronchoscopy with a same method and same device and had no underlying disease, were consecutively enrolled. All patients admitted to a tertiary health care center in Tehran, Iran from 2008 to 2010.

This study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences. Age, sex, bronchoscopy indication, bronchoscopy, and bronchoscopy complications were included in this study as variables. Data collection was performed by a checklist and data were extracted from medical documents. Documents with missing data were excluded.

After gathering the required data, the statistical analysis was performed. We used SPSS (version 13.0) software [Statistical Procedures for Social Sciences; Chicago, Illinois, USA]. Differences were tested by independent-sample-t and chi square tests and were considered statistically significant at P values less than 0.05.

## RESULTS

The mean ( $\pm$ standard deviation) age of the patients was 63.57 $\pm$ 11.43 years; 143 patients (35.75%) were males and 257 (64.25%) were females. Dyspnea (79.5%) was the most common indication for bronchoscopy and thereafter were cough (12.5%), and hemoptysis (6.25%) and in 1.75% there were miscellaneous indications.

The bronchoscopy results showed that in 94.75% of the patients, there were no positive findings and normal report was present; in 3.25% microbiological assessment of the bronchial washing as positive for mycobacterium tuberculosis, and in 1.5% there were positive histological findings for malignancy. Bronchoscopy complications were seen in 13 patients (3.25%) including bleeding (four cases), pneumothorax (three cases), collapse (four cases), and infection (two cases). There was no association between complications and age, sex, bronchoscopy indications and findings ( $p>0.05$ ). For age variable, t-test was used and

for other variables chi-square was used for comparisons (Table 1).

Table 1. Indications for bronchoscopy in understudy patients.

Variables	Total (n=400)
Age, years, mean (SD)	63.57(11.43)
Male gender, number (%)	143(35.75)
Indication for bronchoscopy	13(3.25)
Dyspnea (%)	318(79.5)
Cough (%)	50(12.5)
Hemoptysis( %)	25(6.25)
Miscellaneous (%)	7(1.75)
Bleeding	4(1.0)
Pneumothorax	3(0.75)
Collapse	4(1.0)
Infection	2(0.5)

## DISCUSSION

Bronchoscopy is a diagnostic and therapeutic procedure with good accuracy for different respiratory problems (1,2). Recently, interest in the use of medical registries is increasing rapidly. These databases are used to collect information in a structured fashion and can be used in many different ways, all depending on the intended use of the collected data for better diagnostic and therapeutic programming (3). Hence, this study was performed to determine the complications of bronchoscopy in a tertiary health-care center.

We found a complication rate of less than 5%, this is relatively optimal. Quality of medical care and its improvement is not the only potential use for databases. Careful data collection on patient acuity, outcomes, and expended resources to achieve good quality outcomes are hard data that can and need to be used for rational discussion about appropriate reimbursements for institutions and physicians.

Ernst et al, in the United States evaluated a total of 310 diagnostic procedures over a one-year period in four institutions. There were a few complications, and none required a change in disposition (8). The patients in our study experienced minor events with no need for additional care. For example, the bleeding that follows a brushing or transbronchial biopsy usually stops because

the biopsy is at the capillary level and the pressures are at venous level.

Pue et al, in the United States evaluated 4,273 patients and reported that the mortality rate was 0%, and the frequency of major and minor complications was 0.5% and 0.8%, respectively (9). However, in our study no mortality was seen and the morbidity rate was higher. Another study in Saudi Arabia by Alamoudi et al, on 124 patients demonstrated that pneumothorax was the most common complication but the mortality rate was 0% (10) similar to our study. Ibrahim et al, in Qata evaluated 1006 patients and reported that the main complication were bleeding 9.23% and pneumothorax 8.9% (11) while, bleeding and collapse were more common in our study.

The study performed by Alzeer et al, in Saudi Arabia on 720 patients demonstrated that the overall complication rate was 5%; pneumothorax occurred in 0.56%, (12) which is close to our finding. No mortality was observed in their study similar to ours. Kaparianos et al, in Greece evaluated 4,098 patients and reported the mortality rate to be 0.04% and the frequency for major and minor complications was 0.56% and 0.33%, respectively (13). These frequencies for complications were higher in our study, but the mortality rate was 0%.

Totally, according to the obtained results it may be concluded that bronchoscopy can be performed safely whenever indicated.

The complications occurred were minor and self limiting. Appropriate preparation, close supervision and adherence to the protocol are essential for a successful and safe procedure.

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