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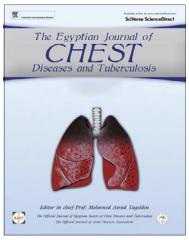

ORIGINAL ARTICLE

Prognostic factors for bronchoscopic electrocautery and/or argon plasma coagulation in patients with central airway obstruction

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KEYWORDS

Therapeutic bronchoscopy;
Central airway obstruction;
Argon plasma;
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Abstract *Background:* Significant portions of central airway stenosis patients present with unresectable disease. Using bronchotherapeutic procedures to maintain a patent airway and improve clinical symptoms and quality of life is a well-known armamentarium technique.

Aim: To assess the contribution of different physiological and pathological prognostic factors on the yield of endobronchial therapies (argon plasma coagulation (APC) and electrocautery) in patients with central airway obstruction whether derived from malignant or non-malignant etiology.

Patients and methods: Twenty nine patients with central airway obstruction, 21 males and eight females, were recruited in the study. All the studied patients were categorized into malignant and non-malignant groups with different pathological varieties. Interventional bronchoscopic procedures were performed under general anesthesia. The flexible bronchoscope was either passed via an endotracheal tube or through the rigid bronchoscope. Collected data included patient demographics, evaluation of performance scale and quality of life status, evaluation of dyspnea, cough and hemoptysis scores before the interventional bronchoscopy and 1 day after the last session. Also the collected data included; length, size, localization and bronchoscopic appearance of the lesion. Duration of symptoms, duration of mechanical ventilation and the presence of collapse prior to the intervention were all recorded. Number of sessions and type of bronchoscopic modalities used were recorded. Spirometric pulmonary function tests were done before and 1 day after the last session.

Results: Complete recanalization was achieved in (17/29) 58.6% of patients, while incomplete or partial recanalization was achieved in (12/29) 41.4% of patients. Using linear regression analysis of

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independent factors affecting patient outcome; it was found that the length of lesion followed by presence of collapse, duration of symptoms and lastly lesion localization whether localized or diffuse ($P < 0.0005$), ($P < 0.011$), ($P < 0.02$) and ($P < 0.039$) were the most independent factors affecting patient outcome.

Conclusion: For favorable outcome, selection of patients with central airway obstructing lesions candidates for bronchoscopic argon plasma coagulation and/or electrocautery should rely on several factors including; age, duration of symptoms, performance scale, co-morbidities, pre-therapeutic FEV1%, presence of lung collapse, and length of the obstructing lesion, moreover its shape and localization.

Introduction

Despite the many options, the management of airway obstruction from either malignant or nonmalignant causes is a complex problem that requires thorough evaluation by a multidisciplinary team including interventional bronchologists, thoracic surgeons and chest radiologists [1].

With increasing numbers of lung cancer patients, increased need for sophisticated interventions in those patients and the expanding role of the Chest Department, Zagazig University in its surrounding environment; intervention bronchoscopy unit with APC and electrocautery was established on 2008.

The aim of this work is to assess the contribution of different physiological and pathological prognostic factors on the yield of endobronchial therapies (argon plasma coagulation and electrocautery) in patients with central airway obstruction whether derived from malignant or non-malignant etiology.

Patients and methods

Patients

This study was conducted in the Chest Departments (Bronchoscopy Units) of the Ain-Shams and the Zagazig University Hospitals during the period from May 2008 to March 2011. Twenty nine patients, 21 males and eight females, their age ranged from 20 to 67 years with a mean age of 50.45 ± 12.14 years were recruited in the study. Patients gave their signed written consent after detailed explanation of the technique. All the included patients had a diagnosed tracheal, bronchial, tracheobronchial or lobar bronchial obstruction.

Inclusion criteria

The main bulk of the lesion was endobronchial, the obstruction should be at the level of the major airways from the trachea, main bronchi or lobar bronchi, the margin between the lesion and the airway should be identified, patients completed their chemotherapy and/or radiotherapy or did not receive it at all, the tumors had contraindication to surgery either absolute or relative in all included patients, and all patients were suffering from distressing and/or life threatening symptoms related to the airway obstruction. The main symptoms of the patients were severe irritating cough, dyspnea or hemoptysis.

Exclusion criteria

Operable tumors without any contraindications to surgery, presence of severe coagulation defect, orthopneic patients with severe respiratory distress, patients with extensive myocardial ischemia in ECG, patients with cardiac arrhythmias, or patients with extrabronchial main bulk of the tumor were excluded from the study.

Patients were categorized according to the etiology of central airway obstruction into two groups: Group I: Malignant group which included 21 patients with malignant airway obstruction; they included 17 patients with bronchogenic carcinoma (three of them were having small cell lung cancer (SCLC), 13 patients were having non small cell lung cancer (NSCLC), and one patient with carcinoid tumor), three patients with endobronchial metastatic cancers, and one patient with endobronchial lymphoma. Group II: Non-malignant group which included eight patients with non-malignant central airway obstruction of which; five patients with secondary stenosis to prolonged orotracheal intubation, one patient with tracheal stenosis secondary to tracheostomy, one patient with endobronchial tuberculosis, and one patient with Wegener's granulomatosis (Figs. 1–4).

All patients were submitted to:

1. Thorough medical history including smoking habit. History of associated illness like diabetes mellitus, hypertension, ischemic heart disease, history suggestive of COPD and history of tuberculosis. Evaluation of dyspnea: Based on the 5-point dyspnea grading system (The American Thoracic Society dyspnea scale) [2]. Evaluation of cough according to Walsh et al. [3] into the following: Grade 0: No cough Grade 1: Cough does not disturb sleep. Grade 2: Cough disturbs sleep. Evaluation of hemoptysis according to Morice et al. [4]: Grade 0: No hemoptysis. Grade 1: Streaks of blood in sputum. Grade 2: Clots of blood in sputum in 4 days or less during the proceeding 2 weeks. Grade 3: Clots of blood in sputum in 5 or more days during the proceeding 2 weeks. Grade 4: Hemoptysis requires blood transfusion. Evaluation of dyspnea, cough and hemoptysis improvement was done before the interventional bronchoscopy and 1 day after the last session. As regards hemoptysis; daily estimation of the amount of hemoptysis after the procedure was ensured.
2. Full clinical examination: general and local chest examination.
3. Plain chest X-ray (postero-anterior and lateral views), before and after each session of the interventional procedure.
4. Electrocardiography (ECG): It was done before each session of the interventional procedures.