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Significance of unilateral vocal cord paralysis diagnosed during bronchoscopy

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Abstract

Background: Morphology and movements of vocal cords should be checked during bronchoscopy. In past literature, unilateral vocal paralysis is considered as benign.
Objective: Evaluation of major underlying disease in patients with unilateral vocal cord paralysis diagnosed during bronchoscopy.
Materials and Methods: A cross sectional case control study design was used to evaluate all patients who underwent bronchoscopy during the year 2003 for various causes. Sample size was 194 patients (0.01 error and 80% potency). Data including patient's respiratory complaints and radiological findings were gathered in a questionnaire. Bronchoscopy was performed in standard condition using local anesthesia. During procedure, vocal cord movement was examined with appropriate maneuver, and complete study of trachobronchial tree with bronchial lavage was done. Appropriate biopsy was performed when indicated. Specimens were sent for evaluation of AFB, cytology, histopathology and culture for mycobacterium tuberculosis.
Results: Unilateral vocal cord paralysis was observed in 10% (19 of total 189 patients who underwent bronchoscopy), Male to female ratio was 3:2 and average age of patients was 65 years (range= 37-76). Cough was the main complaint in 94%, dyspnea in 100% and hemoptysis in 32%. Smoking was present in 9 patients (47%). Vocal cord paralysis in left side was predominant and it was seen in 68% (13/19). Twelve patients (63%) with unilateral vocal cord paralysis had significant lung disease, eight had pulmonary tuberculosis, and four had lung cancer (one SCC, one SmCC, and two undifferentiated carcinoma). Confirmed lung disorders in case group was significantly more than control group (chi square=4.92; p=0.026; Odd ratio= 2.93, 95% Cl=1.01-8.76)). In the remaining patients with vocal cord paralysis (7), one had old healed tuberculosis and 5 had chest roentgenogram strongly suggestive of malignancy who were referred for further evaluation.
Conclusion: The bronchoscopist should pay special attention to unilateral vocal cord paralysis observed during routine bronchoscopy. We observed significant lung disorders present in 63% of these patients.
Keywords: Unilateral vocal cord paralysis, Tuberculosis, Lung cancer, Laryngeal nerve paralysis, Thyroidectomy

Introduction

In previous epidemiological studies, the most important cause of unilateral vocal cord paralysis was claimed to be idiopathic. paralysis showed that in 3.7% of patients the origin of disease was mediastinal/ pulmonary neoplasm(1).

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For patients with lung disease that necessitate undergoing bronchoscopy some other conditions may co-exist. According to preexisting data in patients with lung disease, many physicians try to investigate the lung more precisely and the maneuver required to check the vocal cord function may be missed. The objective of this study was to evaluate the significance of unilateral vocal cord paralysis diagnosed during routine bronchoscopy and its correlation with pulmonary diseases.

Materials and Methods:

A cross sectional case control study design was used to evaluate all patients who underwent bronchoscopy during the year 2003 for various causes. Sample size was 194 patients (0.01 error and 80% potency). Case group was from patients with unilateral vocal cord paralysis and control group from patients with normal vocal cord movement.

Prior to bronchoscopy clinical data including respiratory complaints and imaging findings were gathered in a questionnaire. Flexible bronchoscopy was performed in sterile conditions using local anesthesia. During the procedure, vocal cord movement was examined with appropriate maneuver; then a complete study of trachobronchial tree with bronchial lavage was performed. Appropriate biopsy was performed when indicated. Specimens were sent for evaluation of AFB, cytology and culture for mycobacterium tuberculosis.

This study was approved by the research ethics committee of the Medical School of the Islamic Azad University of Mashhad. A written informed consent was acquired from all patients in this study. Chi square was used for the comparison of case and control groups. Epi-info software was used for statistical analysis.

Results

189 patients were studied. Male to female ratio was 3:2 and the average age was 65 years (SD:17; range=37-76).

Unilateral vocal cord paralysis was observed in 10% (19 of total 189) of patients who underwent bronchoscopy.

Cough was a complaint in 94%, dyspnea in 100% and hemoptysis in 32% of patients. Smoking was present in 9 patients (47%) with unilateral vocal cord paralysis that was not statistically different from other patients with respiratory disorders in control group (p=0.23; Table 1).

Table1: Frequency of clinical and ronchoscopic findings in patients with unilateral vocal cord paralysis

	Frequency	Percent
Cough	18/19	94%
Dyspnea	5/5	100%
Hemoptysis	6/19	31%
Smoking	9/19	47%
Anthracosis	8/19	42%
Anthracofibrosis	6/19	31%
Vegetation	11/19	57%

Vocal cord paralysis in left side was predominant and it was seen in 68% (13/19). Gross findings in bronchoscopy of tracheobronchial tree showed vegetation in 11 patients and anthracosis in 8 patients that is significantly more frequent in patients with unilateral vocal cord paralysis (table 2). After complete investigation, 12 patients (63%) with unilateral vocal cord paralysis proved to have significant lung disease such as tuberculosis in 8 patients and lung cancer in 4 patients (consisting of one SCC, one SmCC and two undifferentiated carcinoma). Confirmed lung disorders in case group was significantly more than control group (chisquare = 4.92; p=0.026; Odd ratio= 2.93, From the remainder of patients with vocal cord paralysis (7 patients), one had old healed tuberculosis and 5 had chest roentgenograms strongly suggestive of malignancy(4 primary and 1 metastatic). These cases were referred for more evaluation.

Table 2: Major pulmonary disorders diagnosed in patients with unilateral vocal cord paralysis

	Frequency	P value	Odd ratio*	Confidence level
Smoking	47%	0.23	1.77	0.62-5.05
Tuberculosis	42%	0.16	2	0.67-5.96
Confirmed lung cancer	21%	0.3	1.95	0.44-8.21
Anthracofibrosis	31%	0.013	4.38	1.28-14.75
Significant lung disease	63%	0.026	2.93	1.01-8.76

*Relative risk of diagnosing special disease according to presence of unilateral vocal cord paralysis

Discussion

Many investigators paid attention to unilateral vocal cord paralysis, but the list of its etiology, has changed very little during the last 50 years(2). Benninger et al in a recent review(3), noted a significant increase in extralaryngeal malignancies (like the results of our study), and nonthyroidectomy surgical trauma. The idiopathic group, which used to account for greater than 50% of patients with vocal cord paralysis, has decreased in frequency to 21%, due to advent of better diagnostic tests (CT, MRI and bronchoscopy) and significant increase in oncologic surgery(4). With the increase in motor vehicle accidents and surgery that could cause injury to the vagus nerve, trauma now accounts for the majority of unilateral vocal cord paralysis (37%), and thyroidectomy is now responsible for less than 10% of unilateral paralysis(5). Thoracic, mediastinal and pulmonary disease seem to participate in the minority of this etiology. Havas et al reported mediastinal/pulmonary neoplasm in 4% of their cases(1), and Netterville JL et alreported thoracic disease and surgery in 15% and inflammatory/infectious disease consisting of Tuberculosis(4), Sarcoidosis and other nonpulmonary conditions in 2.2%. Sarcoidosis and diabetes can induce vocal cord paralysis by a nonpulmonary cranial nerve disease (6-7) Bilateral or unilateral vocal cord paralysis by injury of laryngeal mask is reported as a pulmonary related disorders (8-9) and silicosis because of compression of lymph node in aortopulmonary window(10). In this study we showed that in patients with unilateral vocal cord paralysis observed during routine bronchoscopy, significant lung disorders were present in 63% of cases that was significantly more than the control group (p= 0.025). Of these patients, 2/3 suffered from tuberculosis and 1/3 from lung cancer. Interestingly none of the patients suffered from respiratory distress during bronchoscopy, when bronchoscope lumen occupied the remained area of vocal cord. Only one patient had a huge mass in the supraglotic area that didnot permit bronchoscopy and was excluded from study. Because of the importance of lung disease, many bronchoscopists pay all attention to study the tracheobronchial tree and perform special procedures like transbronchial biopsy, and they may missed examination of the of vocal cord movement.

This is especially true when considering that the etiology of unilateral vocal cord paralysis is mostly reported to be benign, especially idiopathic,(as mentioned above). With regards to the findings from this study, we recommend the examination of the motion of vocal cords during all routine bronchoscopy.

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خلاصه

اهمیت فلج یک طرفه طنابهای صوتی تشخیص داده شده حین برنکوسکپی

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مقدمه: در منابع کلاسیک شایعترین علت فلج یک طرفه طنابهای صوتی علل خوش خیم و ایدیوپاتیک ذکر شده است. هر برنکوسکوپیست موظف است در حین برنکوسکپی کار طنابهای صوتی را بررسی نماید. این مطالعه جهت نشان دادن اهمیت این مسئله و بیماری های ریوی مرتبط با فلج یک طرفه طنابهای صوتی انجام شده است.

روش کار: این مطالعه به صورت مقطعی مورد شاهدی در طول یک سال برای تمام بیمارانی که تحت برنکوسکپی قرار گرفته اند انجام شده است. ابتدا اطلاعات مربوط به شکایت بیمار و یافته های رادیوگرافیک در پرسش نامه یادداشت شده و سپس برنکوسکپی در شرایط استاندارد با بی حسی موضعی انجام شده است. در هنگام برنکوسکپی حرکات طناب های صوتی با مانور لازم بررسی شده و سپس بررسی کامل درخت تراکئوبرنکیال انجام شده است. لاواژ برنکیال به صورت استاندارد انجام و نمونه برای سیتولوژی و اسمیر و کشت مایکوباکتریوم توبرکولوزیس ارسال شده است. در صورت لزوم بیوپسی و بررسی هیستوپاتولوژی انجام شده است. حجم نمونه ۱۹۴ بیمار با ضریب خطای ۱٪ و توان ۸۰٪ تعیین شد.

نتایج: فلج یک طرفه طنابهای صوتی در ۱۰٪ (۱۹ مورد از ۱۸۹ بیمار) که تحت برنکوسکپی قرار گرفتند دیده شد.نسبت مرد به زن ۳ به ۲ و میانگین سنی ۶۵ سال با طیف سنی ۳۷-۷۶ سال بوده است. اصلی ترین شکایات شامل سرفه در ۹۴٪ تنگی نفس در ۱۰۰٪ و هموپتیزیس در ۳۲٪ این بیماران دیده شد. ۴۷٪ بیماران (۹ بیمار) سیگاری بودند. در ۱۲ بیمار با فلج یک طرفه طنابهای صوتی(۶۳٪) بیماری ریوی قابل توجه ثابت شد که شامل ۸ مورد سل و ۴ مورد برنکوژنیک کارسینوما بوده است(SCC و SmCC هرکدام یک مورد و ۲ مورد کارسینوم اندیفرانسیه). از لحاظ آماری بیماری ریوی در گروه مورد به طور آشکاری بیشتر از گروه شاهد بوده است (chi square = 4.92; p=0.026; Odd ratio= 2.93, 95% Cl=1.01-8.76). در مابقی بیماران با فلج یک طرفه طنابهای صوتی یک مورد تصاویر رادیوگرافیک به نفع سل بهبود یافته و در ۵ مورد تصاویر بنفع سرطان داشتند که برای بیوپسی باز فرستاده شدند.

نتیجه گیری: توجه به فلج طنابهای صوتی در حین برنکوسکپی بسیار مهم است و در این مطالعه ۶۳٪ بیماران با فلج یک طرفه طنابهای صوتی دارای بیماری قابل توجه ریوی بوده اند.

واژه های کلیدی: فلج یک طرفه طناب های صوتی، توبرکلوزیس، سرطان ریه، فلج عصب لارنژیال، تیروئیدکتومی