

Histological And Endoscopic Profile Of The Association Between Bronchopulmonary Tumors And Pulmonary Tuberculosis: A Retrospective Analysis

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Abstract:

A retrospective study was conducted in the Department of Pneumology of the Mohamed V Military Training Hospital in Rabat over a period between 2016 and 2019, on all patients with a sequential or concomitant association of pulmonary tuberculosis and primary pulmonary neoplasia. The comparison was made with a control group with pulmonary neoplasia but no pulmonary tuberculosis.

14 cases of tuberculosis and bronchopulmonary cancer were collected during the study period compared to 28 controls. The average incidence was 3.5 new cases/year. The most frequent symptoms were chest pain, dyspnea and cough. General signs were marked by weight loss, anorexia, night sweats and fever.

Bronchial endoscopy was performed in all patients. It revealed thickening of the spurs in 14 patients (33.3%), followed by an inflammatory appearance of the bronchial mucosa in 11 patients (26.2%), infiltration in 8 patients (19%), and a budding tumor in 6 patients (14.3%). Bronchial endoscopy was normal in 3 patients (7.1%).

The frequency of the inflammatory appearance and the normal appearance were higher in the PT/CBP combination group, and the frequency of thickening, infiltration, and budding tumors was higher in the controls.

Keywords: Bronchopulmonary cancer, pulmonary tuberculosis, histological profile

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I. Introduction :

The coexistence of pulmonary tuberculosis (PT) and bronchopulmonary cancer (BPC) represents a diagnostic and therapeutic challenge, particularly in countries where tuberculosis remains endemic. Chronic inflammation, fibrotic scarring, and immune dysregulation secondary to *Mycobacterium tuberculosis* infection have been implicated as possible cofactors in lung carcinogenesis. Conversely, lung cancer can alter host immunity and promote reactivation of latent tuberculosis.

Several studies have reported an increased risk of lung cancer among patients with a history of pulmonary tuberculosis, particularly squamous cell carcinoma, which is often localized in fibrotic or scarred regions. However, the clinical presentation of this association is often misleading, delaying diagnosis and treatment.

The present study aims to describe the clinical, radiological, and endoscopic characteristics of patients presenting a sequential or concomitant association of pulmonary tuberculosis and primary bronchopulmonary carcinoma, and to compare them with patients having lung cancer without tuberculosis.

II. Materials And Methods

This retrospective study was conducted in the Department of Pneumology at the Mohamed V Military Training Hospital of Rabat over a 4-year period, from January 2016 to December 2019.

Study population

All patients presenting a confirmed diagnosis of both pulmonary tuberculosis and primary bronchopulmonary carcinoma, either simultaneously or sequentially, were included. Tuberculosis was

diagnosed based on clinical, radiological, bacteriological, or histological criteria, and lung cancer was confirmed histologically.

A control group was selected from patients diagnosed with primary bronchopulmonary carcinoma without a history or evidence of pulmonary tuberculosis, matched in a 1:2 ratio (14 cases vs. 28 controls) by age and sex.

Data collection

Data were collected from medical records and included sociodemographic characteristics, clinical symptoms, imaging findings, bronchoscopic results, histological type, and disease stage.

Statistical analysis

Quantitative variables were expressed as means $\pm$ standard deviation and qualitative variables as percentages. Comparisons between the two groups were made using the Chi-square test or Fisher's exact test for categorical variables and Student's *t* test for continuous variables. A *p* value < 0.05 was considered statistically significant.

III. Results

A total of 14 patients presenting the association PT/BPC and 28 controls were included, corresponding to an average incidence of 3.5 new cases per year. The mean age of patients was comparable between the two groups, with a male predominance (sex ratio M/F $\approx 4:1$). Most patients were chronic smokers.

Clinical presentation

The predominant symptoms were chest pain, dyspnea, and cough. General signs such as weight loss, anorexia, fever, and night sweats were observed in the majority of patients with the PT/BPC association.

Bronchoscopic findings

Bronchial endoscopy was performed in all patients. It revealed:

- Thickening of the bronchial spurs in 14 patients (33.3%)
- Inflammatory mucosa in 11 patients (26.2%)
- Bronchial infiltration in 8 patients (19%)
- Budding tumor lesions in 6 patients (14.3%)
- Normal appearance in 3 patients (7.1%)

Variables	Association TP et CP (n=14)	Témoins (n=28)	P
Normal aspect §	3 (21.4%)	0 (0%)	0.001
Inflammation §	7 (50%)	4 (14.3%)	
Epaississement §	4 (28.6%)	10 (35.7%)	
Infiltration §	0 (0%)	8 (28.6%)	
Bourgeon §	0 (0%)	6 (21.4%)	

Table 1: Endoscopic aspects between the control group and the study group

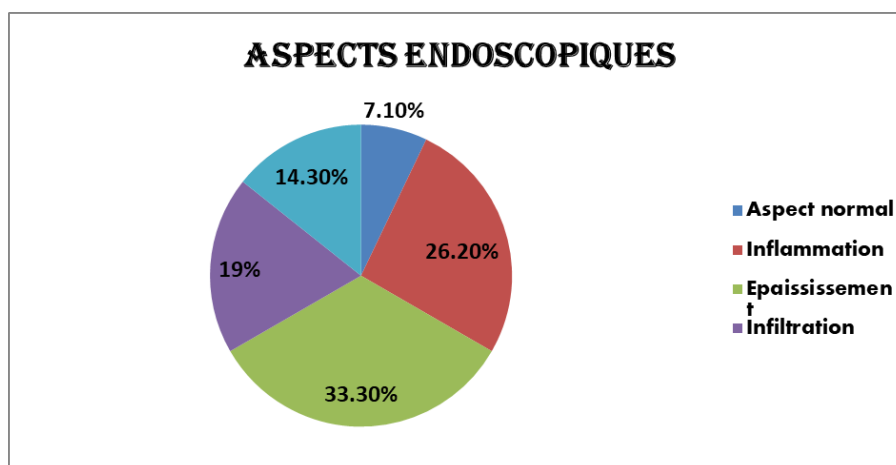


Figure 1 : endoscopic aspect repartition

In comparative analysis, inflammatory and normal aspects were more frequent in the PT/BPC group, whereas thickening, infiltration, and budding tumors were predominant in the control group.

Histological types

Squamous cell carcinoma was the most common histological type, followed by adenocarcinoma and small cell carcinoma. In the majority of cases, cancer developed in a previously tuberculous or fibrotic area.

Examen confirmation	Pourcentage
Bronchic fibroscopy +biopsy	42.8%
Biopsy scan-guided	50%
Biopsie of cervical ADP	7.2%

Table 2: Means of confirmation of bronchopulmonary cancer

IV. Discussion

The coexistence of tuberculosis and lung cancer, although rare, is increasingly recognized, especially in developing countries where tuberculosis remains prevalent. In this study, we identified 14 cases over 4 years, which aligns with the low frequency reported in the literature (0.5–2% of lung cancer cases).

Several mechanisms have been proposed to explain this association. Chronic inflammatory changes and fibrosis resulting from healed tuberculous lesions can induce epithelial metaplasia and genetic instability, thereby favoring malignant transformation. Moreover, *M. tuberculosis* infection can lead to persistent oxidative stress, DNA damage, and immune dysregulation, all of which may contribute to carcinogenesis.

Clinically, distinguishing between active tuberculosis and lung cancer remains challenging due to overlapping symptoms and radiological findings. This diagnostic ambiguity often delays treatment initiation. In our series, most patients presented with non-specific respiratory symptoms, and weight loss was common in both groups.

Bronchoscopic findings showed a predominance of inflammatory or normal mucosa in the PT/BPC group, suggesting that early-stage or infiltrative lesions may be masked by post-tuberculous changes, whereas overt tumor growth (budding masses) was more typical in patients with isolated lung cancer.

Our results are consistent with previous reports by [1,2] who found that patients with coexisting tuberculosis often had atypical bronchoscopic features and lower rates of visible endobronchial tumors.

From a histopathological perspective, squamous cell carcinoma remains the most common type associated with post-tuberculous scarring, as also reported by [3]. This may be related to chronic epithelial injury and regeneration in fibrotic regions.

The retrospective nature and limited sample size are the main limitations of our study. Nevertheless, it highlights the need for systematic screening for lung cancer in patients with a history of pulmonary tuberculosis, especially smokers or those with chronic radiological sequelae.[4]

V. Conclusion

The association of pulmonary tuberculosis and primary bronchopulmonary carcinoma remains uncommon but clinically significant. The coexistence of these two entities poses diagnostic difficulties due to overlapping clinical and radiological features. Bronchial endoscopy plays a crucial role but may reveal non-specific findings.

Early recognition of this association is essential, as delayed diagnosis negatively impacts prognosis. Regular follow-up and imaging surveillance are recommended in patients with prior tuberculosis, particularly those at high risk for lung cancer.

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