

# Case Report

## Mucoepidermoid carcinoma: a rare cause of recurrent pneumonia\*

JOSÉ WELLINGTON ALVES DOS SANTOS<sup>1</sup>, MAURÍCIO LICKS DA SILVEIRA<sup>2</sup>,  
CRISTIANO TONELLO<sup>3</sup>, MELISSA FALSTER DAUBERMANN<sup>4</sup>

### ABSTRACT

Recurrent pneumonia is characterized by frequent infection and infiltrates in one or more lung lobes. The localized form of the disease is caused by intraluminal obstruction, extrinsic compression or structural abnormalities. The pattern, frequency and severity of the infections, together with a thorough review of all chest X-rays, inform the diagnosis. Herein, we report a case of recurrent pneumonia due to endobronchial obstruction by mucoepidermoid carcinoma.

**Keywords:** Pneumonia; Recurrent; Carcinoma, mucoepidermoid/diagnosis; Tomography, X-ray computed; Case reports

---

### INTRODUCTION

Recurrent pneumonia may be defined as two episodes of pneumonia in a single year, or as three or more episodes in any given period.<sup>(1)</sup> The diagnosis should be established upon clinical remission and confirmation of complete radiological resolution between two episodes of infection.<sup>(2-3)</sup> The etiology of recurrent pneumonia is varied and includes endobronchial obstruction, extrinsic compression of airways and structural abnormalities,

as well as metabolic and immunologic dysfunctions. Noteworthy among the least frequent causes are endobronchial tumors, which are pedunculated and can cause intermittent obstruction of the airways, resulting in accumulation of secretion as well as in infection.<sup>(2)</sup> The objective of this study was to report a rare cause of recurrent pneumonia in a young patient, a low-grade mucoepidermoid carcinoma.

---

\*Study carried out at the Universidade Federal de Santa Maria (UFSM, Federal University of Santa Maria), Santa Maria, Rio Grande do Sul, Brazil

1. Ph.D. in Pulmonology and Assistant Professor of Pulmonology at the Universidade Federal de Santa Maria (UFSM, Federal University of Santa Maria), Santa Maria, Rio Grande do Sul, Brazil

2. Resident at the Pulmonology Clinic of the Hospital Universitário de Santa Maria (HUSM, Santa Maria University Hospital), Santa Maria, Rio Grande do Sul, Brazil

3. Medical Student at the Universidade Federal de Santa Maria (UFSM, Federal University of Santa Maria, Santa Maria, Rio Grande do Sul, Brazil), with a Young Investigator grant from the Programa Institucional de Bolsas de Iniciação Científica-Conselho Nacional de Desenvolvimento Científico e Tecnológico (PIBIC-CNPq, Institutional Young Investigator Grant Program-Brazilian Council for Scientific and Technological Development)

4. Pathologist in the Pathology Department of the Hospital Universitário de Santa Maria (HUSM, Santa Maria University Hospital), Santa Maria, Rio Grande do Sul, Brazil

Correspondence to: José Wellington Alves dos Santos. Rua Venâncio Aires, 2020/403 - CEP: 97010-001 Santa Maria, RS, Brasil. Phone: 55 55 225 3018. E-mail: jwasb@terra.com.br

Submitted: 8 December 2004. Accepted, after review: 5 April 2005

## CASE REPORT

A 21-year-old female nonsmoker presented with a history of five episodes of pneumonia over the preceding four years, manifesting as productive cough with yellowish expectoration, accompanied by fever and alterations seen on chest X-rays. She reported total remission of the clinical manifestations after treatment, remaining asymptomatic for up to one year between episodes. In none of the episodes did she require hospitalization, due to the moderate intensity of the clinical profiles presented. Upon admission, she presented symptoms and signs consistent with community-acquired bacterial pneumonia, complaining of symptoms similar to those previously presented. In the physical examination, lung auscultation revealed wheezing in the upper third of the left hemithorax. The chest X-ray only showed a reduction in lung volumes, but a review of all chest X-rays of the previous episodes of infection revealed a consolidation in the same lung segment, with complete radiological resolution according to the control radiograms taken during the treatment.

The subsequent high-resolution computer tomography scan revealed the presence of a circumscribed, pedunculated nodule projecting into the lumen of the left main bronchus, without involvement of adjacent mediastinal structures (Figure 1). Bronchoscopy revealed a vegetative lesion that was pedunculated and obstructive, measuring approximately 2 cm in diameter, in the

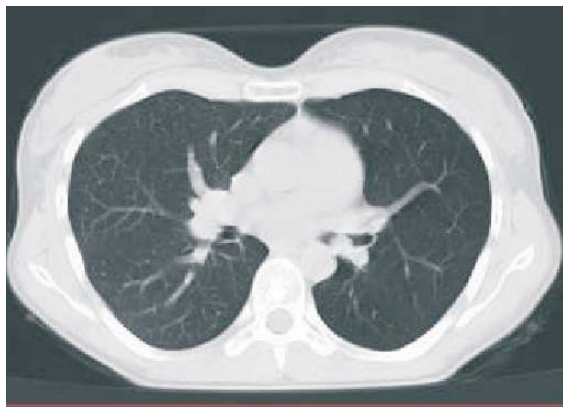


Figure 1 - High-resolution computed tomography scan revealing the presence of an endobronchial lesion in the left main bronchus

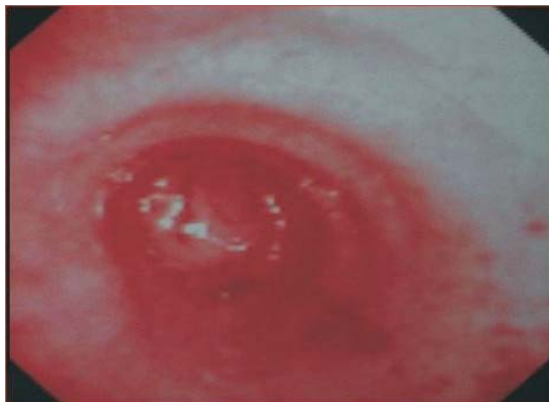


Figure 2 - Bronchoscopic image of the lesion partially obstructing the left main bronchus

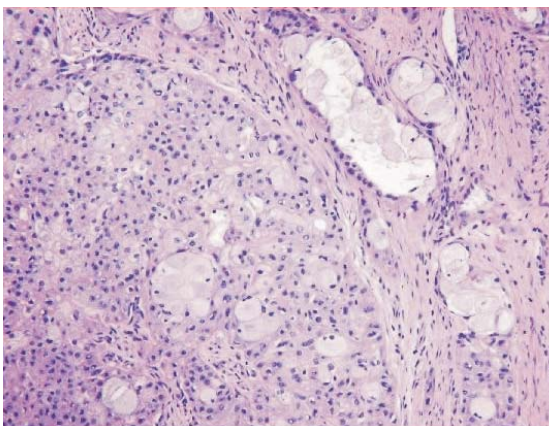


Figure 3 - Glandular structures and mucus-producing goblet cells, together with cystic structures covered by a flat epithelium. In this lung biopsy, the mitotic index was less than significant. (H&E, x100)

left main bronchus (Figure 2). The patient was later submitted to a posterolateral thoracotomy for isolated resection of the affected bronchial segment, followed by surgical reconstruction of the bronchus. Histopathological examination of the resected segment revealed a lesion predominantly consisting of glandular structures and mucus-producing goblet cells, with no significant cytological atypia. The mitotic index was elevated, which is characteristic of a low-grade endobronchial mucoepidermoid carcinoma (Figure 3). Since being treated, the patient has been asymptomatic and has presented no evidence of recurrence, according to semi-annual monitoring with high-resolution computer tomography and bronchoscopy.

## DISCUSSION

Recurrent pneumonia accounts for up to 8% of all pneumonia-related hospitalizations of children and adolescents.<sup>(3)</sup> The diagnosis is generally challenging, since various conditions can be implicated in the etiology of the disease. Making an accurate diagnosis demands that a detailed clinical history be compiled, taking into consideration the age at onset, duration of symptoms, frequency of infections and severity of the clinical profile, and that this history be considered together with the radiological evidence of the infection. The cause should be initially approached when the infectious process in the lung parenchyma is located radiologically since the diagnostic evaluation is quite distinct between one situation and another.<sup>(2)</sup> The involvement of multiple lung lobes is generally caused by immunological, metabolic or neurological abnormalities, whereas the involvement of a single lobe or lung segment may suggest intraluminal obstruction by a foreign body or bronchial tumor, extraluminal compression caused by infectious or noninfectious lymphadenopathy, or even structural alterations, such as tracheal bronchus, stenosis or bronchial atresia, as well as bronchomalacia, localized bronchiectasis or other causes.<sup>(4-5)</sup>

The chest X-ray is extremely important in all suspected cases of recurrent pneumonia since it allows the diagnostician to differentiate between recurrent and persistent pulmonary infiltrates. In many cases, the chest X-ray of a patient who is not currently infected may be normal, and a high-resolution computed tomography scan may help locate the endobronchial lesions.

Bronchoscopy is usually indicated since it makes it possible to visualize the lesion, pinpoint its location, determine the potential involvement of neighboring structures and collect surgical specimens.<sup>(2)</sup>

The case presented shows the diagnostic approach to a suspected case of low-grade mucoepidermoid carcinoma causing recurrent pneumonia in a single lung lobe of a young patient with a history of recurrent pulmonary infections caused. Mucoepidermoid carcinomas are rare primary lung neoplasms,<sup>(6-8)</sup> located in the main bronchi, trachea, or, more commonly, in segmental bronchi.<sup>(6,9)</sup> They are typical of salivary glands, but their endobronchial location is justified by

embryological similarities.<sup>(7)</sup> Histologically, they are considered benign tumors but have a potential for malignancy and are divided into only two varieties: low-grade and high-grade.<sup>(10-11)</sup>

Similar to other endobronchial tumors, mucoepidermoid carcinomas present insidious evolution with nonspecific clinical manifestations, which generally suggests other diagnoses, such as foreign body aspiration and asthma.<sup>(6,9,11)</sup> Physical examination reveals unilateral wheezing upon lung auscultation in the cases in which the neoplasia is located in the main bronchus, as observed in this case.<sup>(9)</sup>

In one of the largest case series studies, which involved 58 patients, a slightly higher incidence was found among females (27:18 and 7:6 in low-grade and high-grade cases, respectively).<sup>(6)</sup> The authors also found that the incidence was higher among subjects from 20 to 30 years of age, although individuals of all ages were affected.

The differential diagnosis of bronchial mucoepidermoid carcinoma from a histopathological study includes mucous gland adenoma and pulmonary tumors of the salivary gland type, especially adenoid cystic carcinoma and pleomorphic adenoma, as well as the most common types of bronchial carcinoma.<sup>(6,9)</sup>

The partial resection of the left main bronchus, with tumor-free surgical margins, performed without involving adjacent structures and followed by surgical reconstruction of the bronchus, was adopted in this case because it is curative for low-grade tumors, and postoperative radioactive therapy or chemotherapy are only indicated in cases of high-grade tumors with recurrence of the lesion.<sup>(8-9,11-12)</sup>

Therefore, the greatest challenge in attempting to avert subsequent episodes of pulmonary infection is to identify the presence of recurrent pneumonia and its etiology. Radiological monitoring informs the diagnosis by allowing the differentiation between single and multiple lung lobe involvement and their different causes. Therefore, the incidence of recurrent infiltrates in a single lung segment should raise the suspicion of intraluminal obstruction by an endobronchial tumor.

## REFERENCES

1. Wald ER. Recurrent pneumonia in children. *Adv Pediatr Infect Dis.* 1990;5:183-203.

2. Vaughan D, Katkin JP. Chronic and recurrent pneumonias in children. *Semin Respir Infect.* 2002;17(1):72-84.
3. Owayed AF, Campbell DM, Wang EE. Underlying causes of recurrent pneumonia in children. *Arch Pediatr Adolesc Med.* 2000;154(2):190-4.
4. Wald ER. Recurrent and nonresolving pneumonia in children. *Semin Respir Infect Dis.* 1993;8(1):46-58.
5. Regelmann WE. Diagnosing the cause of recurrent and persistent pneumonia in children. *Pediatr Ann.* 1993;22(9):561-8.
6. Yousem SA, Hochholzer L. Mucoepidermoid tumors of the lung. *Cancer.* 1987; 60(6):1346-52.
7. Turnbull AD, Huvos AG, Goodner JT, Foote FW Jr. Mucoepidermoid tumors of bronchial glands. *Cancer.* 1971;28(3):539-44.
8. Vadasz P, Egervary M. Mucoepidermoid bronchial tumors: a review of 34 operated cases. *Eur J Cardiothorac Surg.* 2000;17(5):566-9.
9. Kim TS, Lee KS, Han J, Im JG, Seo JB, Kim JS, et al. Mucoepidermoid carcinoma of the tracheobronchial tree: radiographic and CT findings in 12 patients. *Radiology.* 1999;212(3):643-8.
10. Barsky SH, Martin SE, Matthews M, Gazdar A, Costa JC. "Low grade" mucoepidermoid carcinoma of the bronchus with "high grade" biological behavior. *Cancer.* 1983;51(8):1505-9.
11. Heitmiller RF, Mathisen DJ, Ferry JA, Mark EJ, Grillo HC. Mucoepidermoid lung tumors. *Ann Thorac Surg.* 1989;47(3):394-9.
12. Santambrogio L, Cioffi U, De Simone M, Rosso L, Ferrero S, Giunta A. Video-assisted sleeve lobectomy for mucoepidermoid carcinoma of the left lower lobar bronchus: a case report. *Chest.* 2002;121(2):635-6.