

# Tracheal Stenosis Secondary to Complete Tracheal Rings in an Asthmatic Patient

*Estenosis traqueal secundaria a anillos traqueales completos en una paciente asmática*

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## INTRODUCTION

Complete tracheal rings are the cause of uncommon tracheal stenosis in adult patients, and more common in neonates. Only a few cases are reported in the literature, and on many occasions, adult patients are asymptomatic or show mild respiratory symptoms similar to other diseases such as asthma. The computed tomography (CT) is essential to be able to differentiate the structure of tracheal rings and distinguish it from other diseases, such as stenosis following intubation.

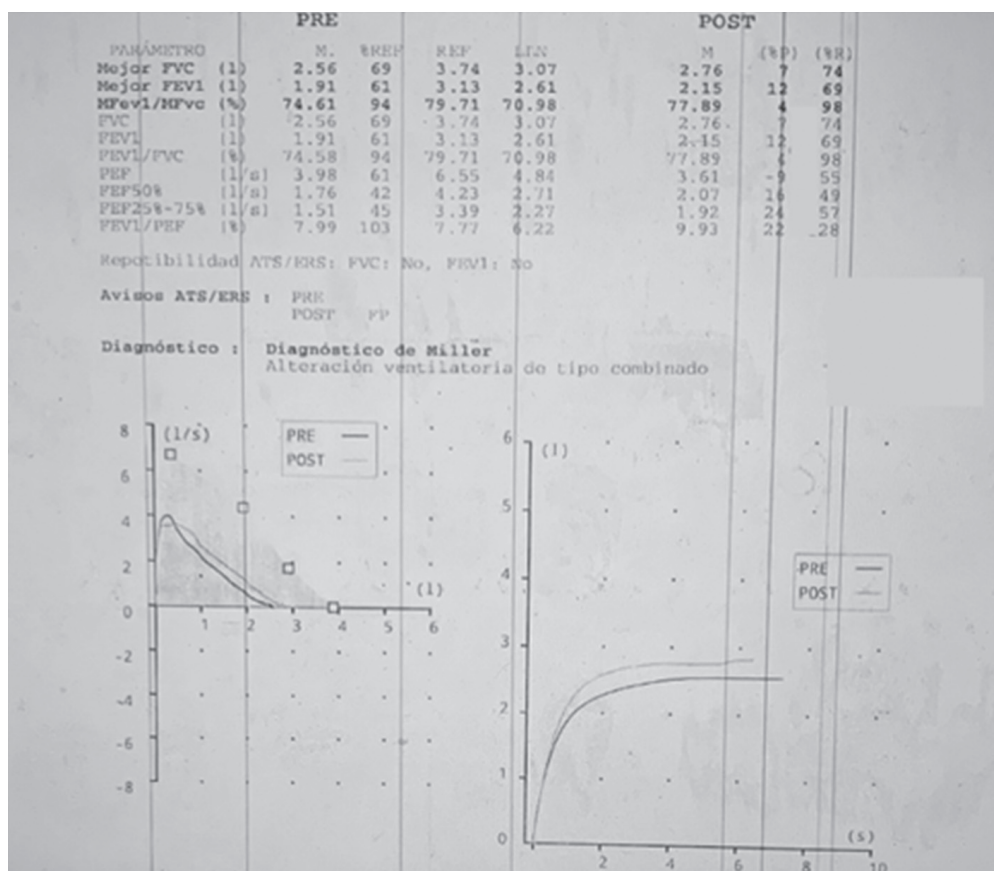
Generally, adult patients undergo surveillance endoscopy or local treatment, in contrast to neonates, who receive surgical treatment.

## CASE REPORT

32-year-old woman, no relevant medical history, referred for dyspnea mMRC (Modified Medical Research Council Scale) grade II-III/IV 2 years ago. The patient was diagnosed with asthma through pulmonary functional tests (Figure 1) and allergy skin tests to pneumoallergens (prick test) positive to mites. During subsequent consultations, the patient didn't show any improvement despite the prescribed treatments, such as inhaled bronchodilators, omalizumab and corticosteroids. A CT was performed to discard any associated disease; it showed globally and uniformly reduced tracheal caliber (Figures 2 A and B). One bronchoscopy showed complete tracheal rings throughout the trachea with reduced lumen, together with concentric stenosis of the upper right lobe bronchus, with permeable distal lumen (Figures 2 C and D).

Due to these findings, the patient was diagnosed with bronchial hyperresponsiveness caused by heightened sensitivity to pneumoallergens, and she continued receiving bronchodilators and steroids as needed.

A consensus was reached on follow-up consultations every six months together with patient surveillance through spirometry, endoscopy and imaging, taking into account the patient's decision, age, and distal permeability of the bronchial tree.



**Figure 1.** Pulmonary functional test done in first consultation, with flow-volume (*left*) and volume-time (*right*) curves properly performed, showing FEV1/FVC (forced expiratory volume on the first second/forced vital capacity) of 74.61% together with a FEV1 of 61%. After the bronchodilator test, a 12% improvement is seen in the FEV1

## DISCUSSION

Complete tracheal rings are rare in adult patients; there are very few cases reported in the literature.<sup>1</sup> This condition is generally diagnosed in neonates, and is characterized by defects occurring during the embryonic stage in the membranous portion of the tracheal rings, causing lumen stenosis.

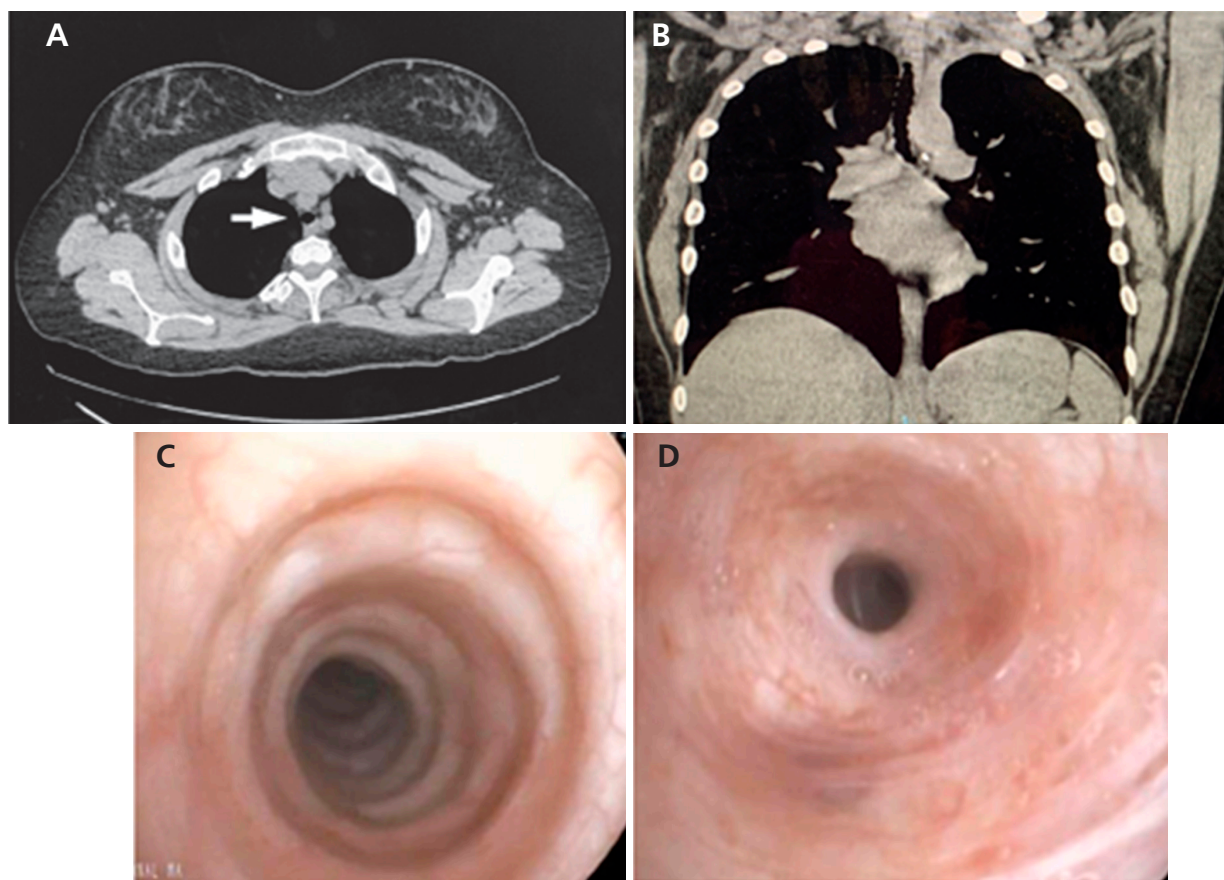
Clinical symptoms are highly variable. Severe cases are reported in neonates, compared to adult patients, who are generally asymptomatic or show dyspnea, cough, sibilance or other non-specific symptoms similar to those of asthma; that is why it should be included in the differential diagnosis of this disease.<sup>1</sup>

CT images may be useful for the diagnosis. These show the narrowing of the tracheal lumen in the shape of an “O” instead of a “C” appearance, without wall thickening.<sup>2</sup> These findings differentiate this condition from other types of stenosis, such as the one produced after an intubation.

Cases with many symptoms, which generally occur in neonates, require surgery, even though sometimes the endoscopic follow-up or local treatments (such as tracheal dilation, seen in adults) are enough.<sup>3</sup>

### Conflict of interests

The authors declare that there is no conflict of interests.



**Figure 2.** A. Axial section of chest CT showing reduction of the tracheal caliber of less than one centimeter (*arrow*). B. Coronal plane of chest CT showing normal tracheal path. C. Endoscopic image showing complete tracheal rings. D. Endoscopic image showing concentric stenosis of upper right lobe bronchus

## REFERENCES

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