When Dyspnea has a Structural Twist in Allergy Clinics

Dispneia para Além da Alergia: Quando a Causa é Estrutural

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MENSAGEM-CHAVE: A dispneia persistente, refratária à terapêutica da asma, deve levantar a suspeita de obstrução estrutural da via aérea. Este caso ilustra a importância de considerar causas raras, como as malformações do arco aórtico, salientando a necessidade de uma abordagem multidisciplinar para alcançar um diagnóstico correto e uma gestão segura.

RESUMO

A obstrução das vias aéreas no adulto pode resultar de causas estruturais ou funcionais, mimetizando por vezes condições comuns como a asma. Descrevemos o caso de uma mulher de 33 anos, referenciada à Imunoalergologia por suspeita de asma não controlada, que mantinha dispneia e obstrução nasal apesar de terapêutica otimizada. Os testes de função respiratória sugeriram obstrução das vias aéreas superiores. A imagiologia revelou um arco aórtico direito a causar compressão extrínseca da traqueia e hipertrofia da amígdala lingual contribuindo para estreitamento póstero-basal da língua. A nasofibroscopia confirmou hipertrofia dos cornetos e da base da língua, com mobilidade laríngea preservada. A avaliação multidisciplinar por Otorrinolaringologia, Pneumologia, Cardiologia e Cirurgia Torácica considerou a cirurgia vascular de elevado risco, sendo recomendada uma abordagem conservadora com otimização da terapêutica médica. Este caso evidencia a importância de ponderar anomalias estruturais raras em adultos com sintomas respiratórios refratários. Uma abordagem multidisciplinar e individualizada é essencial para um diagnóstico preciso e para uma gestão segura do doente.

PALAVRAS-CHAVE: Asma; Obstrução da Via Aérea

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KEY CLINICAL MESSAGE: Persistent dyspnea unresponsive to optimized asthma therapy should raise suspicion for structural airway obstruction. This case illustrates the importance of considering rare causes such as aortic arch malformations, highlighting the need for multidisciplinary assessment to achieve accurate diagnosis and safe management.

ABSTRACT

Airway obstruction in adults can arise from both structural and functional causes, sometimes mimicking common conditions such as asthma. We describe a 33-year-old woman referred to Immunoallergology for presumed uncontrolled asthma, who persisted with dyspnea and nasal obstruction despite optimized therapy. Pulmonary function testing suggested upper airway obstruction. Imaging revealed a right-sided aortic arch causing extrinsic tracheal compression and lingual tonsil hypertrophy contributing to retrobasilingual narrowing. Flexible nasoendoscopy confirmed turbinate and tongue-base hypertrophy with preserved laryngeal mobility. Multidisciplinary evaluation by Otorhinolaryngology, Pulmonology, Cardiology, and Thoracic Surgery deemed vascular surgery too high-risk, and conservative management with optimized medical therapy was recommended. This case illustrates the importance of considering rare structural anomalies in adults with refractory airway symptoms. A multidisciplinary, individualized approach is essential to achieve accurate diagnosis and safe management.

KEYWORDS: Airway Obstruction; Asthma

INTRODUCTION

Upper airway obstruction in adults is multifactorial, arising from both inflammatory and structural causes. Right-sided aortic arch (RAA) is a rare condition, present in only 0.05%–0.1% of the population.[1-3] Although frequently asymptomatic, certain branching patterns—particularly vascular rings—may compress the trachea or esophagus, especially in children.[4,5] Lingual tonsil hypertrophy (LTH) in adults is uncommon but may cause nonspecific symptoms such as dysphagia, voice changes, foreign-body sensation, choking, or obstructive sleep apnea, and can complicate airway management.[6] A recent study found clinically significant LTH to be rare, with no major difference between patients with and without obstructive sleep apnea (13.5% *vs* 14.6%).[7]

When structural anomalies coexist with inflammatory airway disease such asthma or rhinitis, clinical presentation becomes complex. Accurate diagnosis and effective management often require a multidisciplinary approach.

CASE REPORT

A 33-year-old woman with a history of allergic rhinitis, asthma, endometriosis, and childhood adenotonsillectomy was referred to the Immunoallergology Department for evaluation of persistent dyspnea, initially attributed to uncontrolled asthma. Laboratory testing confirmed sensitization to house dust mites (*Dermatophagoides pteronyssinus* and *Dermatophagoides farinae*) and cat dander. Despite optimized therapy with a combination of inhaled corticosteroid and long-acting β_2-agonist, intranasal corticosteroid/antihistamine, and bilastine, she continued to experience nasal obstruction and dyspnea. Pulmonary function testing demonstrated a flow–volume curve suggestive of upper airway obstruction (Fig. 1), prompting further investigation. Although the functional pattern indicated a high (extrathoracic) obstruction, subsequent imaging revealed a causative lesion located below the laryngeal level, an exceptionally rare presentation.[8]

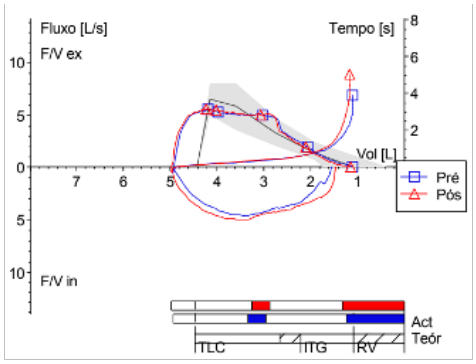
Computed tomography (CT) of the paranasal sinuses revealed inferior turbinate hypertrophy, mild septal deviation, partial opacification of the right maxillary sinus, and no polyps or mass lesions. Flexible nasoendoscopy confirmed turbinate hypertrophy, lingual tonsil enlargement, and normal laryngeal mobility. Neck CT further demonstrated lingual tonsil hypertrophy contributing to retrobasilingual narrowing.

Thoracic CT identified a right-sided aortic arch with extrinsic compression of the trachea, reducing its caliber to 8 × 13 mm (Fig. 2). CT angiography and echocardiography excluded additional cardiac or vascular malformations.

Given the combination of structural anomalies, the case was discussed in a multidisciplinary team including Otorhinolaryngology, Pulmonology, Cardiology, Thoracic Surgery, and Immunoallergology. Cardiothoracic surgery considered vascular intervention too high-risk, and conservative management with medical therapy was recommended. Otorhinolaryngology interventions, including turbinate reduction and possible lingual tonsil surgery, remain under consideration.

ESPIROMETRIA

	Prev.	Basal	Z-score	%...	LLN	ULN	Pós BD	Z-score	Var Pós..
VC MAX	3.39	3.84		114	2.71	4.09	3.82		-1
FVC	3.39	3.84		114	2.71	4.09	3.82		-1
FEV 1	2.85	3.31		116	2.28	3.40	3.29		-1
PEF	6.42	5.50		86	4.94	7.91	5.53		0
FEV1% VC MAX	84.40	86.03		102	72.99	93.54	86.10		0
FEV1% FVC	84.40	86.03		102	72.99	93.54	86.10		0
MMEF 75/25	3.21	3.97		124	2.03	4.60	3.98		0
MEF 50	3.21	4.94		154	2.03	4.60	4.95		0
FIF 50		4.55					4.83		6
FEF 50	3.21	4.94		154	2.03	4.60	4.95		0



PEF: 330 L/min FEV1: 3310 mL

FIGURE 1. Spirometry showing FIF_{50}/FEF_{50} ratio = 0.92 within normal limits, but FEV_1/PEF= 10 mL/L/min and the morphology of the flow-volume curve suggests a fixed plateau pattern in the expiratory portion (typical of upper airway obstruction).[8]

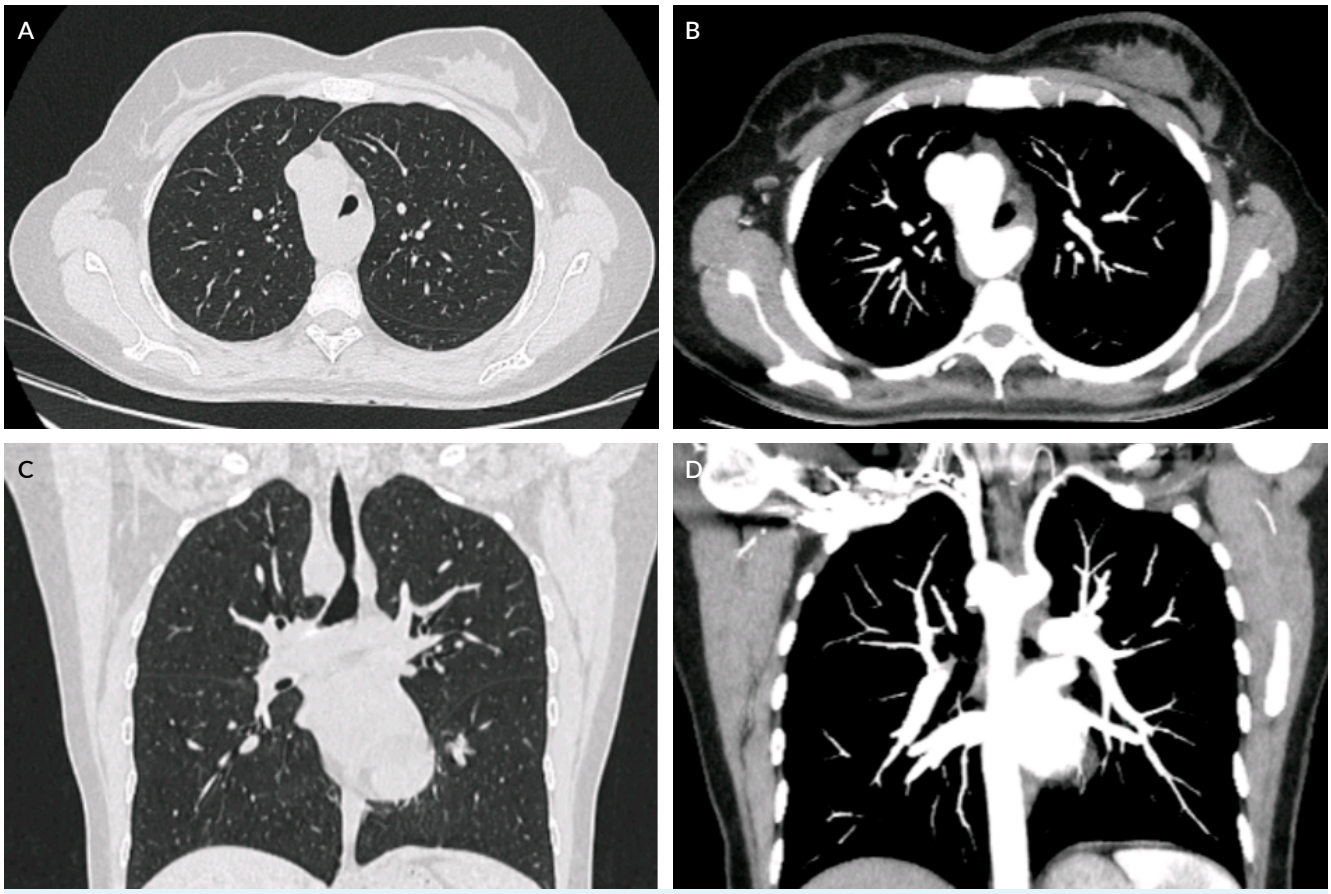


FIGURE 2. Thoracic computer tomography (A, B) and computer tomography angiography (C, D). Axial (A, C) and coronal (B, D) views showing right-sided aortic arch (arrow) with the thoracic aorta and proximal descending segment located to the right of the trachea (*), causing extrinsic tracheal compression with a caliber of 8 mm (transverse) × 13 mm (anteroposterior).

DISCUSSION

This case underscores the diagnostic challenges that arise at the intersection of inflammatory and structural airway disease. Right aortic arch (RAA) is rare, with an estimated prevalence of 0.05%–0.1%.[1–3] Although frequently asymptomatic, variants such as RAA with an aberrant left subclavian artery may result in mediastinal compression.[4,5] Likewise, lingual tonsillar hypertrophy (LTH), often an incidental finding, can lead to clinically significant airway obstruction and pose anesthetic challenges due to difficult laryngeal visualization.[6,7] Its impact becomes particularly relevant in adults presenting with overlapping airway symptoms.

In this patient, tracheal compression secondary to the right-sided aortic arch represented the principal mechanism of obstruction and the major determinant of respiratory symptoms. LTH likely played a secondary or contributory role—insufficient to account for the spirometric abnormalities or daytime dyspnea alone—though it might have contributed to nocturnal airflow limitation or sleep-disordered breathing.

A comprehensive diagnostic approach, integrating endoscopy, pulmonary function testing, and cross-sectional imaging, was essential to define the relative contributions of each condition. Management required multidisciplinary collaboration. Given the high surgical risk of vascular repair, a conservative strategy was adopted, reserving otorhinolaryngologic intervention for symptom progression.

This case highlights that not all dyspnea in patients with allergic backgrounds should be ascribed to asthma alone. Recognition of structural airway anomalies is critical when symptoms appear disproportionate to the degree of allergic disease and remain refractory to optimized therapy.

CONCLUSION

Persistent respiratory symptoms that fail to improve despite optimized medical therapy should prompt clinicians to broaden the differential diagnosis and consider structural causes of airway obstruction, even within allergy and asthma specialty settings. Recognition of coexisting functional and anatomical abnormalities is crucial, as misattribution of symptoms solely to inflammatory airway disease can delay appropriate management and expose patients to unnecessary medication escalation.

This case illustrates how careful integration of functional assessment, endoscopic visualization, and cross-sectional imaging can clarify the interplay between inflammatory and structural mechanisms. A multidisciplinary approach—encompassing allergology, pulmonology, radiology, and otorhinolaryngology—proved essential to achieving an accurate diagnosis and guiding an individualized, risk-adapted therapeutic strategy. Ultimately, awareness of such rare structural contributors to dyspnea may improve diagnostic precision and optimize outcomes in patients whose respiratory symptoms remain refractory to conventional treatment.

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RBP, SS - Conceptualisation and writing of the manuscript.

ILM - Conceptualization and resources

PMS - Validation

RA - Validation and review

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REFERENCES

1. Arazińska A, Polguj M, Szymczyk K, Kaczmarska M, Trębiński Ł, Stefańczyk L. Right aortic arch analysis - Anatomical variant or serious vascular defect? BMC Cardiovasc Disord. 2017;17:102. doi: 10.1186/s12872-017-0536-z.
2. Hanneman K, Newman B, Chan F. Congenital Variants and Anomalies of the Aortic Arch. Radiographics. 2017;37:32-51. doi: 10.1148/rg.2017160033.
3. Radiopaedia. Right-sided aortic arch [Internet]. 2024 [cited 2025 Sep 14]. Available from: https://radiopaedia.org/articles/right-sided-aortic-arch-2.

4. Backer CL, Mavroudis C, Rigsby CK, Holinger LD. Trends in vascular ring surgery. J Thorac Cardiovasc Surg. 2005;129:1339-47. doi: 10.1016/j.jtcvs.2004.10.044.

5. EDWARDS JE. Anomalies of the derivatives of the aortic arch system. Med Clin North Am. 1948;32:925-49. doi: 10.1016/s0025-7125(16)35662-0.

6. Hope N, Patricia Smith C, Moran M, Primrose W. An unusual case of lingual tonsillar hypertrophy. Clin Case Rep. 2016;4:526-7. doi: 10.1002/ccr3.552.

7. Tang JA, Lee JW, Huon LK, Malhotra A, Chang JL. Incidence of lingual tonsil hypertrophy in adults with and without obstructive sleep apnea. Laryngoscope. 2018;128(3):732–7.

8. Aliverti A, Barjaktarevic I, Cooper BG, Culver B, Derom E, Hall GL, et al. ERS/ATS technical standard on interpretive strategies for routine lung function tests. Eur Respir J. 2022;60:2101499. doi: 10.1183/13993003.01499-2021.