

Case Report

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Endobronchial amyloidosis mimicking bronchial asthma: a case report and review of the literature

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Abstract: Among two tracheobronchial forms (local and diffuse) and two parenchymal forms (nodular and alveolar septal) that were reported in previous literature, localized endobronchial amyloidosis is an uncommon disease of unknown cause. Bronchial amyloid deposits can occur as focal nodules or multifocal infiltration of the submucosa. We report the case of a 47-year-old man who had complained of dyspnea and wheezing for 1 month and who had been treated for severe asthma at another hospital. Endobronchial amyloidosis was confirmed by histological examination of the bronchial biopsies.

Keywords: Amyloidosis, Asthma, Bronchial neoplasm, Wheezing.

1 Introduction

Amyloidosis is a spectrum of diseases associated with abnormal extracellular deposition of amyloid and fibrillar protein material which may be light chains synthesized by increased plasma cells [1-3]. Tracheobronchial

amyloidosis, which is one of the localized variants of amyloidosis, is regarded as a rare disease [4-6]. Herein, we report a case of endobronchial amyloidosis masquerading as bronchial asthma and presenting as dyspnea and diffuse wheezing.

2 Case report

A 47-year-old man was referred to our hospital with complaints of progressive dyspnea for 1 month and wheezing. He had experienced persistent cough and weight loss. He was a current smoker with a 20-pack-year smoking history and had been diagnosed with bronchial asthma at another hospital 2 years ago. The physical examination revealed an acutely ill appearance and a respiratory rate of 23 cycles per minute. Diffuse wheezing was heard throughout both lung fields. Laboratory data showed leukocytosis ($16,600/\text{mm}^3$) and a slightly elevated C-reactive protein level (5.5 mg/dL). The pulmonary function test showed an obstructive pattern with severe limitation of both inspiratory and expiratory flow rates.

The chest radiography showed patchy opacity in the right upper and both lower lung fields. Computed tomography (CT) of the chest showed an irregularly narrowed bronchus wall with a small polypoid mass attached to the right upper lobar bronchus, and some infiltrative opacities in both lower lobes (Figure 1). Flexible bronchoscopy revealed exophytic hypervascular masses accompanied by erythematous inflammation with a white mucosal patch in the right upper lobar bronchial orifice (Figure 2). Multiple, variably sized endobronchial nodules were also apparent in the orifice of the lingular segment of the left upper lobe and both lower lobar basal segments. The lumens of both sides of the bronchi were extremely narrowed.

The pathologic findings showed an amorphous pinkish material deposit in endobronchial tissue. These deposits exhibited a red color at Congo-red stain. These deposits showed a green birefringence under polarized microscopy on Congo red stain, a finding characteristic of

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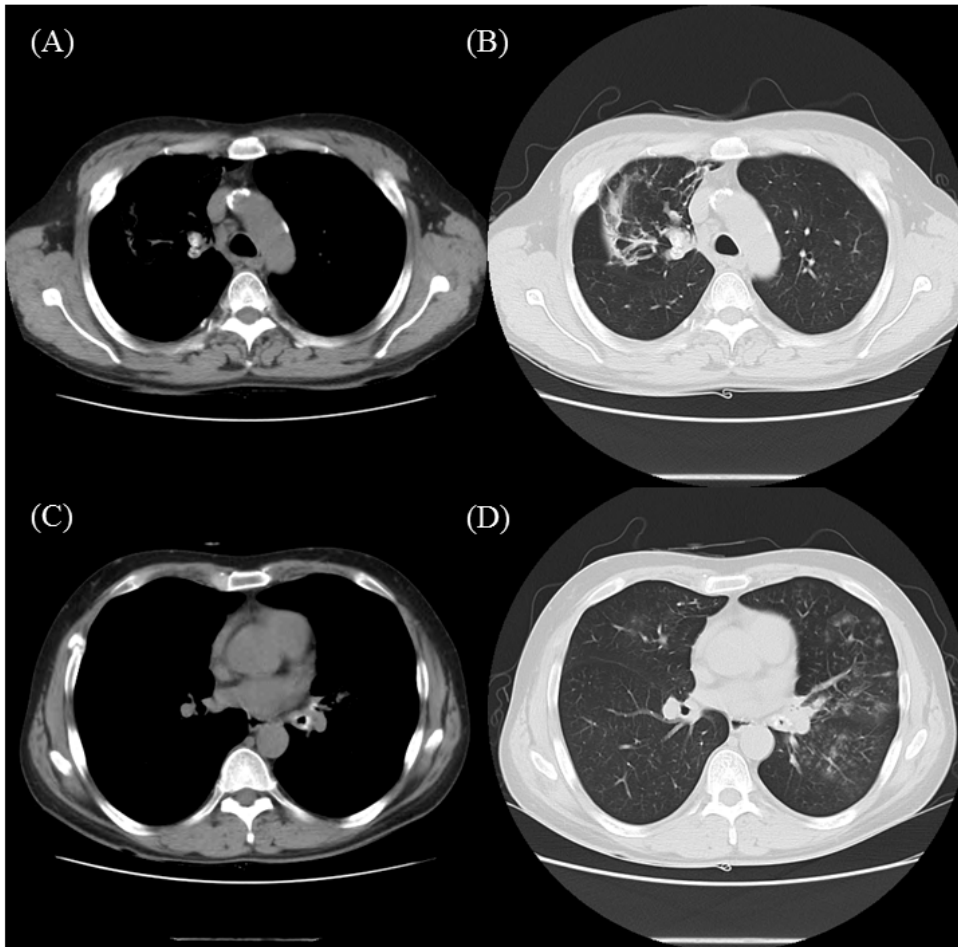


Figure 1: (A) Chest computed tomography shows an irregularly narrowed bronchus wall with a small polypoid mass attached to the right upper lobar (RUL) bronchus. (B) Peribronchial consolidation with cystic and tubular bronchiectasis, mucoid impactions and multiple centrilobular nodules are seen with patchy ground glass opacities in RUL area. (C) Luminal narrowing is shown due to irregular calcified wall thickening in left upper and lower lobar bronchi. (D) There is associated obstructive pneumonitis with some infiltrative opacities involving lingular segments of left upper lobe and superior segment of left lower lobe.



Figure 2: (A) Bronchoscopy revealed exophytic hypervascular nodular projections accompanied by erythematous inflammation with a white mucosal patch in the right upper lobar bronchial orifice. (B) Two endobronchial nodules are also observed at the orifice of right lower lobe. (C) The lumens of the bronchi are extremely narrowed due to multiple variable sized nodules in the orifice of the lingular segment of the left upper lobe and left lower lobar basal segments.

immunoglobulin light chain amyloid fibrils (Figure 3). We evaluated the patient further to determine whether systemic involvement was present. Immunoelectrophoretic analyses of the plasma and urine and the urinary Bence-Jones protein test were negative. The echocardiography showed only mild diastolic dysfunction. The duodenoscopic finding was unremarkable, and colonoscopy showed multiple colon ulcers and polyps. However, colonic biopsy revealed a tubular adenoma with low-grade dysplasia. Based on the above comprehensive evaluation, the diagnosis of primary amyloidosis was established because there was no evidence of extrapulmonary organ involvement.

With a definite diagnosis of endobronchial amyloidosis, the patient received systemic steroid and bronchodilator therapy for relieving the symptom of endobronchial obstruction. Gradual improvement was observed in the

patient's dyspnea, and he was discharged from the hospital. The follow-up bronchoscopy which was performed 1 month later showed no significant interval change.

Ethical approval: The research related to human use has been complied with all the relevant national regulations, institutional policies and in accordance the tenets of the Helsinki Declaration, and has been approved by the authors' institutional review board or equivalent committee.

Informed consent: Informed consent has been obtained from all individuals included in this study.

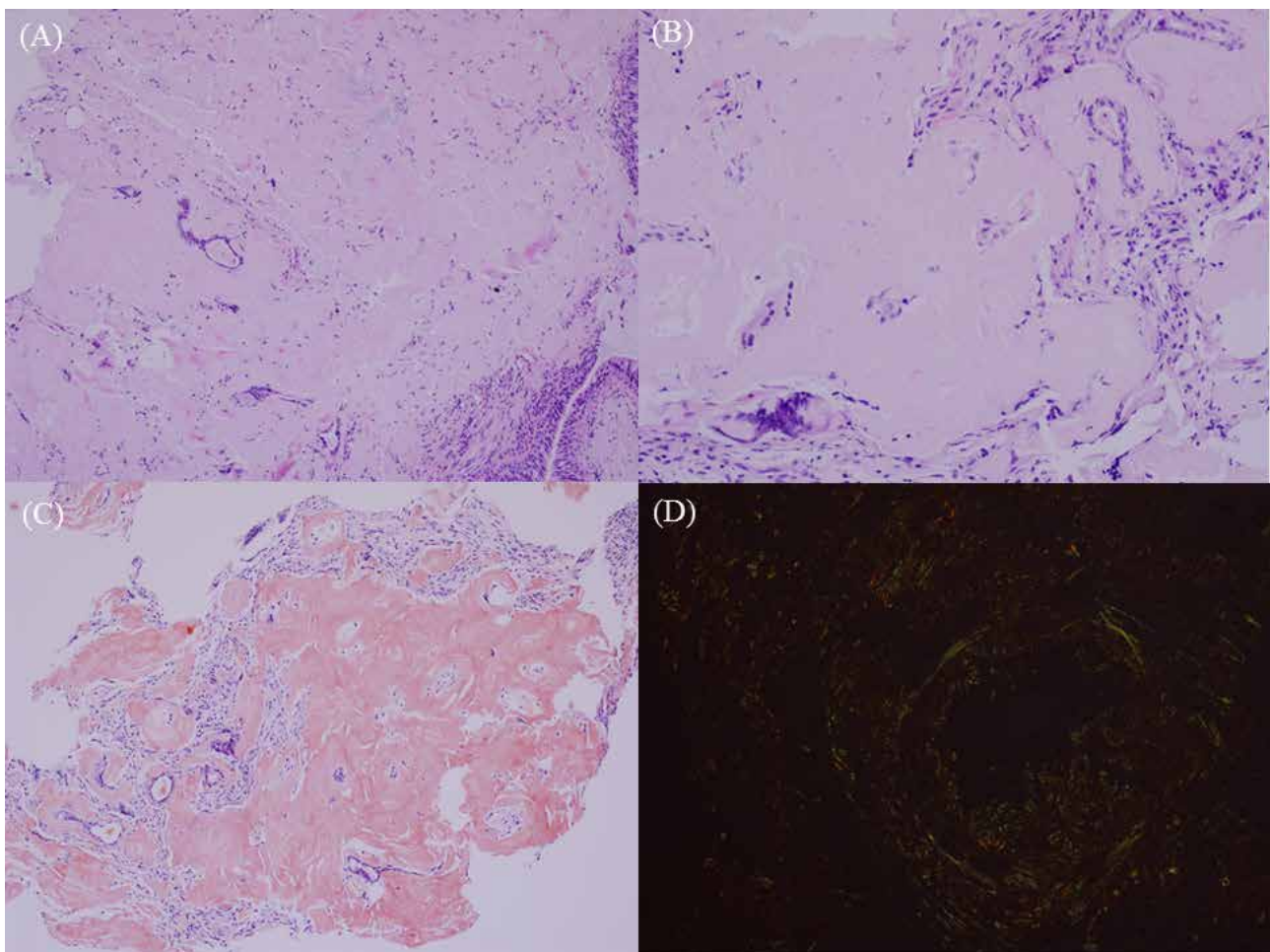


Figure 3: Pathologic findings.

(A) The bronchoscopic tissue shows an amorphous material deposit in endobronchial area (X40). (B) The pinkish material is associated with multinucleated giant cells (X100). (C) The material shows a red color at Congo-red stain (X20). (D) These deposits exhibit a green birefringence under polarized microscopy on Congo red stain (X400).

3 Discussion

Amyloidosis is the infiltration of amorphous extracellular material into multiple organs [1, 2]. Amyloidosis can be hereditary or acquired and localized or systemic. The cause remains unclear. The major types are immunoglobulin light chain (AL) and amyloid-associated (AA). AL is associated with primary systemic amyloidosis, myeloma-associated amyloid, and most localized forms of amyloid. AA is associated with an immunoglobulin protein synthesized by the liver, and this protein is deposited in secondary amyloidosis [3].

Solitary amyloid deposits in the tracheobronchial tree or pulmonary parenchyma are unusual manifestations of primary amyloidosis [4]. Respiratory amyloidosis was first described in 1877 by Lesser [7]. Respiratory impairment is uncommon and 4 types of involvement have been described: 2 tracheobronchial forms (local and diffuse) and 2 parenchymal forms (nodular and alveolar septal), of which diffuse tracheobronchial amyloidosis is the least common [8]. Although amyloidosis is a benign lesion, the condition can sometimes be fatal as a result of airway obstruction or respiratory failure. Cases of respiratory failure or recurrent pneumonia secondary to bronchial obstruction have been reported [4]. The symptoms are usually nonspecific, mimicking common respiratory conditions such as bronchial asthma or pneumonia [9-11]. Therefore, a complete evaluation, including endoscopic examination and biopsy, is required for pulmonary amyloidosis. CT showed bronchial-wall thickening and luminal narrowing at various levels of the bronchial tree in our patient. CT is useful for revealing the full extent of disease. Electrophoresis of serum and urine for the detection of monoclonal proteins should be conducted to investigate the possibility of systemic involvement.

The treatment varies, depending on the patient's symptoms and degree of obstruction [2, 3, 12]. Because this condition can cause respiratory failure due to airway obstruction, endobronchial interventional treatment must be considered in patients with severe dyspnea. Surgical excision or bronchoscopic debulking is the mainstay of treatment [2, 13, 14]. Carbon dioxide laser ablation or low dose external beam radiation has recently been used in several cases. Presently, no established effective medical treatment exists, but repeated bronchoscopic treatment is thought to be a safer and better option than surgery. In conclusion, a plan of monitoring and intermittent bronchoscopic symptomatic treatment should be balanced against the risk of endobronchial fibrosis and irreversible stenosis caused by too frequent interventions.

4 Conclusion

Tracheobronchial amyloidosis, which is one of the localized variants of amyloidosis, is regarded as a rare disease. Clinicians should be aware of the possibility of endobronchial diseases in case of localized wheezing.

Conflict of interest statement: Authors state no conflict of interest

References

- [1] Kirchner J, Jacobi V, Kardos P, Kollath J. CT findings in extensive tracheobronchial amyloidosis. *Eur Radiol* 1998;8: 352-354
- [2] Berk JL, O'Regan A, Skinner M. Pulmonary and tracheobronchial amyloidosis. *Semin Respir Crit Care Med* 2002;23: 155-165
- [3] Wang Q, Chen H, Wang S. Laryngo-tracheobronchial amyloidosis: a case report and review of literature. *Int J Clin Exp Pathol* 2014;7: 7088-7093
- [4] Utz JP, Swensen SJ, Gertz MA. Pulmonary amyloidosis. The Mayo Clinic experience from 1980 to 1993. *Ann Intern Med* 1996;124: 407-413
- [5] Kwon SW, Kim YK, Jung KH, Kim DS, Jeon WK, Suh YL. A case of tracheo-bronchial amyloidosis. *Korean J Med* 1993;45: 690-695.
- [6] Kwak YG, Kim HJ, Lee CH, Kim SY, Cho JH, Kwak SM, Lee HL, Kim JM, Han HS, Ryu JS. A Case of Primary Localized Tracheobronchial Amyloidosis. *Tuberc Respir Dis* 2002;52: 174-178
- [7] Gillmore JD, Hawkins PN. Amyloidosis and the respiratory tract. *Thorax* 1999;54: 444-451
- [8] Jiang X, Wang G. On primary pulmonary amyloidosis. *Eur J Radiol* 2012;81: 1968
- [9] Sharma SK, Ahluwalia G, Ahluwalia A, Mukhopadhyay S. Tracheobronchial amyloidosis masquerading as bronchial asthma. *Indian J Chest Dis Allied Sci* 2004;46: 117-119
- [10] Serraj M, Kamaoui I, Znati K, Kouara S, Sahnoune F, Amara B, Biaze ME, Tizniti S, Amarti A, Benjelloun MC. Pseudotumoral tracheobronchial amyloidosis mimicking asthma: a case report. *J Med Case Rep* 2012;6: 40
- [11] Rezik WK, Ayadi H, Ayoub A. [Localized tracheobronchial amyloidosis: a rare cause of pseudo-asthma]. *Rev Pneumol Clin* 2001;57: 308-310
- [12] Lee SJ, Lee WY, Jung SH, Kwon W, Lee SN, Lee N, Kim SH, Shin KC, Yong SJ. A Case of Primary Localized Laryngo-tracheobronchial Amyloidosis. *Tuberc Respir Dis* 2008;65: 532-536
- [13] Flemming AF, Fairfax AJ, Arnold AG, Lane DJ. Treatment of endobronchial amyloidosis by intermittent bronchoscopic resection. *Br J Dis Chest* 1980;74: 183-188
- [14] Weismann RE, Clagett OT, Mc DJ. Amyloid disease of the lung treated by pneumonectomy; report of a case. *J Thorac Surg* 1947;16: 269-281