A 44-year-old man with hemoptysis

Raju Pangeni, Saurabh Mittal, Sudheer Arava[1], Vijay Hadda, M Ramam[2], Anant Mohan, Gopi C Khilnani, Randeep Guleria, Karan Madan

Departments of Pulmonary Medicine and Sleep Disorders, [1]Pathology and [2]Dermatology, All India Institute of Medical Sciences, New Delhi, India

ABSTRACT

A 44-year-old man with background history of diffuse cutaneous systemic sclerosis and dilated cardiomyopathy receiving immunosuppressive medications, presented with a 2-month history of cough and streaky hemoptysis. Clinicoradiological features were consistent with an endotracheal mass. Subsequently, the patient developed nodular skin lesions and the tracheal mass increased in size causing central airway obstruction. This clinicopathologic conference discusses the clinical and radiological differential diagnoses of such a clinical presentation and their management options.

KEY WORDS: Bronchoscopy, central airway obstruction, histoplasmosis

Address for correspondence: Dr. Karan Madan, Department of Pulmonary Medicine and Sleep Disorders, All India Institute of Medical Sciences, Ansari Nagar, New Delhi - 110 029, India. E-mail: drkaranmadan@gmail.com

PRESENTATION OF THE CASE

Raju Pangeni

A 44-year-old man presented to the pulmonary outpatient clinic with a history of a dry cough and occasional streaky hemoptysis of 2 months' duration. He had no constitutional symptoms and denied having chest pain, wheezing, orthopnea, paroxysmal nocturnal dyspnea, hoarseness, dysphagia, or bleeding tendencies. He was diagnosed with diffuse cutaneous systemic sclerosis with polyserositis and cardiomyopathy (left ventricular ejection fraction 30%) 4 years ago and had been clinically stable on treatment with oral steroids and methotrexate. Other medications included diuretics, carvedilol, and aspirin. He was a lifetime never smoker and nonalcohol consumer with no recent exposure to a patient with active tuberculosis, occupational dusts, chemicals, and to birds/pets. He had received a course of antibiotics with no clinical improvement.

On physical examination, the vital signs and oxygen saturation while breathing room air were normal. Examination revealed digital pitting scars and sclerodactyly. Respiratory system examination was unremarkable. JVP was not elevated. On cardiovascular examination, third heart sound was audible and apex beat was palpable in 6th intercostal space lateral to the midclavicular line. His blood counts, renal and liver function tests and urine examination were within normal range. Sputum samples sent for Gram stain and culture, acid-fast stain, mycobacterial cultures were negative. HIV-ELISA was negative.

Initial chest radiograph demonstrated cardiomegaly along with narrowing of lower tracheal air shadow [Figure 1a]. Computerized tomographic (CT) scan of thorax revealed an endoluminal soft-tissue mass in the distal trachea along with few left upper lobe lung nodules [Figure 1b]. With the possible clinico-radiological diagnosis of a tracheal tumor, flexible bronchoscopy was performed which showed a polypoidal growth in the distal trachea, located 2 cm above the carina and was occupying approximately one-third of the cross-sectional tracheal lumen. The distal airways

Access this article online

Quick Response Code:

Website: www.lungindia.com

DOI: 10.4103/lungindia.lungindia_282_17

How to cite this article: Pangeni R, Mittal S, Arava S, Hadda V, Ramam M, Mohan A, *et al*. A 44-year-old man with hemoptysis. Lung India 2018;35:343-7.

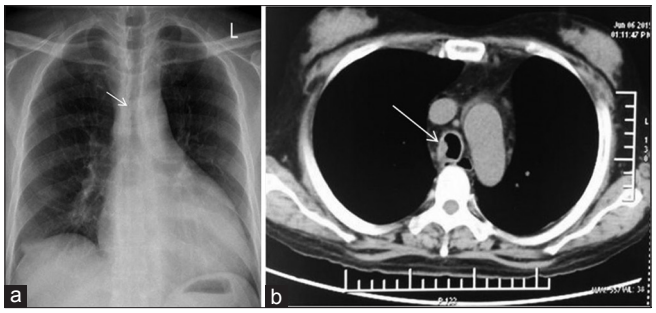

Figure 1: (a) Chest radiograph demonstrating distal tracheal narrowing. (b) Computerized tomography thorax showing tracheal endoluminal growth

appeared normal. Multiple endobronchial biopsies and wash were taken and sent for pathological analysis.

The patient was lost to follow-up and presented again to the outpatient department a month later with a fresh episode of streaky hemoptysis along with the appearance of skin nodules over the scalp and right inguinal region. Clinical examination revealed the presence of expiratory stridor. He had a nodular growth over the right frontotemporal region of the scalp [Figure 2c] and another on the right medial thigh [Figure 2b], which were well-defined, exophytic with undermined base, painless, nonpruritic, nonnecrotic, and nondischarging. A repeat bronchoscopy showed that the tracheal mass had enlarged in size to occupy nearly two-third of the distal tracheal lumen [Figure 2a]. An excisional biopsy of the nodules was performed. Positron-emission tomography CT scan was also performed which showed high FDG uptake from the tracheal as well as the cutaneous lesions along with a circumferential bowel thickening in the distal small bowel. Colonoscopy was planned but deferred in view of his poor cardiac reserve.

SALIENT FEATURES OF THE CASE AND DIFFERENTIAL DIAGNOSIS

Karan Madan

This middle-aged man with the previous history of systemic sclerosis and dilated cardiomyopathy, apparently well controlled on medications, has now presented with a 2-month history of cough and streaky hemoptysis. As he had a longstanding cardiac disease and was on antiplatelets, these symptoms could easily be overlooked and be attributed to heart failure and drug-induced coagulopathy. However, the lack of characteristic symptoms and signs of heart failure, history of hemoptysis, absence of bleeding manifestations elsewhere and presence of distal tracheal narrowing in the chest radiograph prompted us to do a further workup. The lack of constitutional symptoms, CT findings and bronchoscopy point toward a localized airway involvement along with possible pulmonary parenchymal disease. We would like to review the differential diagnoses of tracheal tumors in this age group.

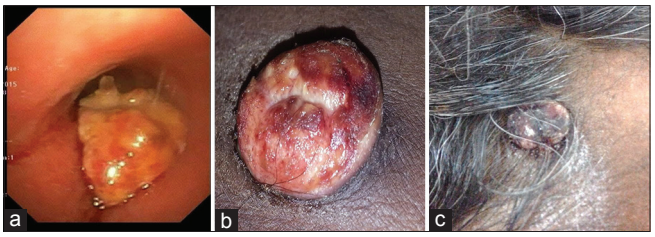

Figure 2: (a) Bronchoscopic view showing tracheal mass obstructing a significant part of the tracheal lumen. (b and c) Cutaneous nodules over inguinal regions and the scalp

Saurabh Mittal

Malignant tracheal tumors

Primary tracheal tumors are rare entities, accounting for <1% of all malignant tumors.[1] Most primary tracheal tumors are malignant with squamous cell carcinoma (SCC) and adenoid cystic carcinoma (ACC) accounting for >90% of the cases. SCC is common in smokers whereas ACC is more prevalent in nonsmokers. Carcinoma arising from thyroid or esophagus can metastasize or infiltrate into the trachea often leading to central airway obstruction. In a nonsmoker with no history suggestive of esophageal involvement, ACC remains a possibility. Solitary tracheal carcinoid is another differential diagnosis, and these can bleed and present with hemoptysis.[2] Systemic sclerosis has also been associated with increased incidence of malignancies.[3] Rare aggressive tumors of the trachea like rhabdoid tumors presenting as central airway obstruction have also been described.[4]

Benign tracheal tumors

From the management point of view, any lesion causing airway obstruction can lead to death and should not be regarded as necessarily "benign." Squamous papilloma is the most common benign tracheobronchial neoplasm and can be solitary or multiple. Multiple papillomas can extensively involve the airways and can lead to central airway obstruction.[5] The solitary papilloma usually occurs in adults and is related to smoking or may arise de novo, unlike "papillomatosis" which is common in children and is associated with papillomavirus infection. Tracheal papillomatosis can unusually lead to respiratory failure necessitating urgent rigid bronchoscopic airway intervention. Tracheal hamartoma may demonstrate CT features of characteristic fat density along with calcification. Lipoma and leiomyoma may have a similar appearance but do not have calcified areas. These tumors are usually slow growing. It is difficult to rule out benign neoplasms in our patient.

Infective etiologies

Tuberculosis can have varied clinical and radiological presentation depending on the bacterial and host characteristics and continues to be the major diagnostic challenge in the developing world. Inflammatory polyps may form due to chronic irritation, trauma, infection, or foreign body which seems unusual in this case considering the tracheal location of the lesion rather than bronchial.

Endobronchial fungal infections due to *Aspergillus, Mucor, Candida, Coccidioides,* and *Histoplasma* species are well described in immunocompromised patients but can also occur in apparently immunocompetent individuals also.[6,7] I would suggest bronchoscopic samples to be processed for stain and cultures for mycobacteria and fungi in addition to histopathology.

CLINICAL DIAGNOSIS

Primary tracheal tumor (likely malignant).

GC Khilnani
With these clinical possibilities, can we have the histopathological evaluation of the specimen?

Sudheer Arava
Histopathological examination of the endobronchial biopsy from the tracheal tumor revealed sheets of histiocytes with areas of necrosis. Majority of the histiocytes showed the presence of numerous, tiny intracellular organisms. Special histochemical stain, Gomori silver methenamine stain showed that these organisms are approximately measuring about 2–4 microns and they have clear space around them. These morphological features are characteristic of Histoplasma organisms [Figure 3a and b]. Stains for acid-fast bacilli were negative. Tracheal wash from the tumor revealed mainly hemorrhagic material with few alveolar macrophages. Cultures were sterile. KOH mount and fungal culture were negative.

Randeep Guleria
From the dermatological perspective, what could be the clinical possibilities at this stage?

M Ramam
In a situation like this, there are two possibilities. One that the cutaneous lesions are related to the tracheal mass, and the other that they are not. The differential diagnoses for the latter situation are very broad and would include a variety of inflammatory, infective, benign, and malignant causes of cutaneous nodules. If we assume that the cutaneous and tracheal lesions are related, the nodules may represent cutaneous metastases from a primary lung malignancy, or metastases to both the skin and lung from a primary malignancy located elsewhere. Infections that could affect both the lung and the skin may present similarly. Tuberculosis is the most common such infection but the respiratory mycoses such as histoplasmosis, coccidioidomycosis, blastomycosis, cryptococcosis, aspergillosis, and pneumocystis also enter the differential diagnosis. Rhinosporidiosis usually affects the nose and upper respiratory tract but tracheal masses have been reported and cutaneous dissemination may also occur. In this case, the endobronchial biopsy report was available at the time the cutaneous lesions were evaluated and histoplasmosis was considered in the differential diagnosis though this is an unusual presentation.

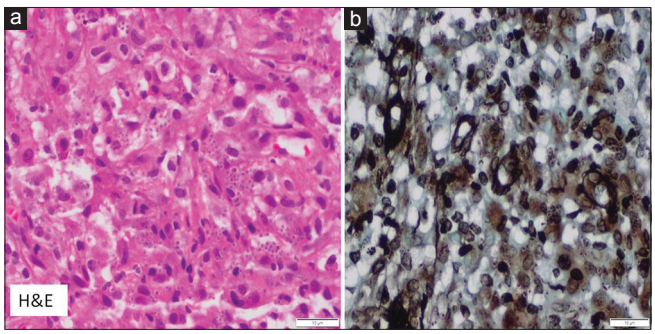

Figure 3: Histopathological examination of the tracheal growth showing multiple intracellular organisms on (a) H and E and (b) Grocott-Gomori methenamine silver stain

Sudheer Arava
Microscopic examination of the two excisional biopsy samples also revealed similar histopathological features like that of tracheal biopsy with sheets of histiocytes and numerous intracellular organisms morphologically resembling Histoplasma.

PATHOLOGICAL DIAGNOSIS

Disseminated Histoplasmosis–Tracheal and Cutaneous Involvement.

Anant Mohan
Histoplasmosis is caused by inhalation of spores from a dimorphic fungus, Histoplasma capsulatum. The fungus remains in a mycelial form at ambient temperatures and grows as yeast at body temperature in humans.[8] The disease is endemic along the river valleys of the United States and Yangtze River in China. In India, it is endemic in the Gangetic delta and has also been reported from eastern, northeastern and southern India. It may present in several forms predominantly pulmonary manifestations (pulmonary syndrome), mediastinal symptoms (mediastinal syndrome), or with features of dissemination to other organs such as colon, adrenals, skin, and brain (progressive disseminated histoplasmosis). It has also been described as a causative agent for fibrosing mediastinitis and tracheobronchial stenosis.[9] Disseminated histoplasmosis presenting as diffuse tracheal nodularity and ulcerative growths has been described in some case reports.[10] To the best of our knowledge, histoplasmosis presenting as well-defined cutaneous nodules and isolated tracheal mass has not been reported previously in the literature.

Vijay Hadda
Most patients with pulmonary histoplasmosis have nonspecific radiological findings. These range from airspace opacities or consolidation in acute cases with or without mediastinal lymphadenopathy to single or diffusely calcific nodules in chronic form. Thoracic CT is helpful in the evaluation of patients with central airway obstruction and those with suspected fibrosing mediastinitis. The distal tracheal growth along with the

lung nodules and cutaneous lesions suggests disseminated form of histoplasmosis. Bronchoscopic findings also are nonspecific and similar to any infective or neoplastic conditions and include nodular, ulcerative growths with exudative or erythematous mucosa.

FINAL DIAGNOSIS

Disseminated histoplasmosis, diffuse cutaneous systemic sclerosis, and dilated cardiomyopathy.

Raju Pangeni

How was this patient managed?

Karan Madan

This patient, on the one hand, had critical airway narrowing which could be fatal if the obstruction worsens. Rigid bronchoscopy is the ideal modality for airway management and recanalization in this situation.[5,11-13] However, the multiple underlying comorbidities in the patient, especially the presence of dilated cardiomyopathy increase the risk of general anaesthesia and procedural complications during rigid bronchoscopy. Unlike malignant central airway obstruction, where the nature of disease usually leads to consideration of rigid bronchoscopy and airway stenting as the modality of choice, in this patient the infectious etiology as the underlying cause also merits considering the option of a conservative approach.

We discussed the options along with the associated risks and benefits with the patient and the caregivers. The patient was admitted to the hospital, and antifungal treatment was initiated. It was decided to keep the patient under close monitoring and proceed to rigid bronchoscopy if the airway obstruction worsened. Intravenous liposomal amphotericin B was started. The patient showed quick improvement of symptoms over the next few days and after a cumulative dose of 4 g of amphotericin B, stridor disappeared, and the tracheal mass significantly decreased in size [Figure 4]. The patient was discharged home on oral Itraconazole 200 mg twice daily and was planned to continue it for at least a year after complete resolution of the sites of involvement. Methotrexate was discontinued, and prednisolone was gradually tapered off, as advised by the rheumatology services.

SUMMARY

This case highlights that tracheal masses have a broad differential diagnosis and are not always malignant. Histoplasmosis can present with an isolated tracheal growth causing central airway obstruction, which may respond well to systemic antifungals and invasive bronchoscopic interventions may be considered judiciously. One must also keep in mind the atypical presentations of fungal infections, especially in immunosuppressed patients.

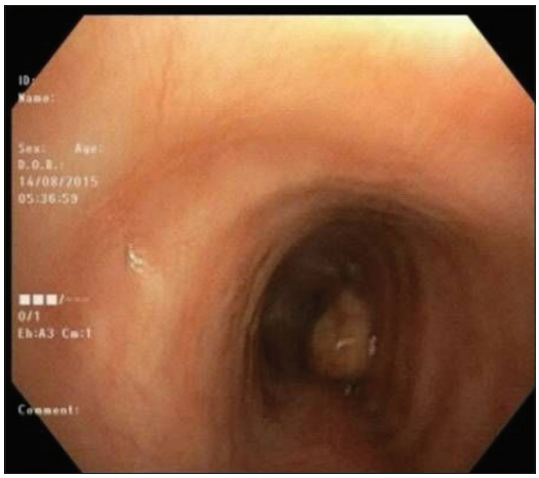

Figure 4: Follow-up of bronchoscopic image showing reduction in size of the tracheal mass after treatment with intravenous Amphotericin B

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Sherani K, Vakil A, Dodhia C, Fein A. Malignant tracheal tumors: A review of current diagnostic and management strategies. Curr Opin Pulm Med 2015;21:322-6.
2. Hadda V, Madan K, Mohan A, Kalai U, Guleria R. Successful flexible bronchoscopic management of dynamic central airway obstruction by a large tracheal carcinoid tumor. Case Rep Pulmonol 2014;2014:349707.
3. Singh N, Madan K, Bhattacharya A, Nijhawan R. Malignant pleural mesothelioma in a patient with systemic sclerosis: The first report. Respiration 2013;85:66-71.
4. Madan K, Bal A, Agarwal R, Das A. Malignant extra renal rhabdoid tumour presenting as central airway obstruction. Case Rep Pulmonol 2014;2014:950869.
5. Madan K, Dhungana A, Madan NK, Mohan A, Hadda V, Garg R, *et al*. Rigid bronchoscopic management of acute respiratory failure in a 30-year-old woman. Lung India 2016;33:672-4.
6. Karnak D, Avery RK, Gildea TR, Sahoo D, Mehta AC. Endobronchial fungal disease: An under-recognized entity. Respiration 2007;74:88-104.
7. Nattusamy L, Kalai U, Hadda V, Mohan A, Guleria R, Madan K, *et al*. Bronchoscopic instillation of liposomal amphotericin B in management of nonresponding endobronchial mucormycosis. Lung India 2017;34:208-9.
8. Wheat LJ, Azar MM, Bahr NC, Spec A, Relich RF, Hage C, *et al*. Histoplasmosis. Infect Dis Clin North Am 2016;30:207-27.
9. Loyd JE, Tillman BF, Atkinson JB, Des Prez RM. Mediastinal fibrosis complicating histoplasmosis. Medicine (Baltimore) 1988;67:295-310.
10. Youness H, Michel RG, Pitha JV, Jones KR, Kinasewitz GT. Tracheal

and endobronchial involvement in disseminated histoplasmosis: A case report. Chest 2009;136:1650-3.
11. Madan K, Agarwal R, Aggarwal AN, Gupta D. Therapeutic rigid bronchoscopy at a tertiary care center in North India: Initial experience and systematic review of Indian literature. Lung India 2014;31:9-15.
12. Vishwanath G, Madan K, Bal A, Aggarwal AN, Gupta D, Agarwal R, *et al*. Rigid bronchoscopy and mechanical debulking in the management of central airway tumors: An Indian experience. J Bronchology Interv Pulmonol 2013;20:127-33.
13. Sehgal IS, Dhooria S, Madan K, Pattabhiraman V, Mehta R, Goyal R, *et al*. Placement of tracheobronchial silicone Y-stents: Multicenter experience and systematic review of the literature. Lung India 2017;34:311-7.