Partners in stridor: An uncommon cause for central airway obstruction

Sir,

Central airway stenosis is a reported complication and sequela of tracheobronchial tuberculosis. Commonly, the affected segment is fibrostenotic, with symptoms and presence of stridor dependent on the extent of airway narrowing.

A 23-year-old female, who completed a 6-month course of conventional antituberculous therapy (ATT) for sputum smear-positive pulmonary tuberculosis a year ago, presented with progressive dyspnea of 3-month duration. Clinical examination revealed biphasic stridor. Room air saturation was normal. Routine blood investigations and blood gases were normal. Chest X-ray [Figure 1a] revealed a right upper lobe collapse. Spirometry showed irreversible airflow limitation [Figure 2a]. Flexible bronchoscopy revealed a nonnegotiable mid-tracheal stenosis with an irregularly shaped crescentic lumen 6 cm below the vocal cords [Figure 3a]. Computed tomogram of the chest with coronal image reconstruction and virtual bronchoscopy [Figure 1b and c] revealed a short stenotic segment having an ultra-short left posterolateral wall and a slightly longer right anterolateral wall, resembling a tracheal web and possibly granulation tissue, respectively. We proceeded with a rigid bronchoscopy under general anesthesia.

On intubating and advancing till the carina with an 8 size ventilating rigid tracheobronchoscope, the tracheal web was released. Flexible bronchoscopy was performed through the rigid barrel, and both bronchial trees were inspected. All segments were normal except for the right upper lobe lumen which could not be visualized. The rigid barrel was then withdrawn till its distal tip was just proximal to the stenotic segment [Figure 3b]. The tracheal web was seen folded on itself, lying medially along what seemed like a fibrous band, and the stenotic lumen was seen bounded by the latter and the combined web with granulation tissue anterolaterally. Using electrocautery, the remnants of the tracheal web and the fibrous band were removed, and near-complete luminal patency was achieved [Figure 3c and d]. She was extubated and was discharged 2 days later.

Histopathological examination of the tissue removed revealed the tracheal web to consist of a layer of respiratory mucosa, the fibrous band to consist of respiratory mucosa...
Tracheal or bronchial webs are usually congenital, thin membrane-like diaphragms that partially or completely occlude the airway. Fibrous bands or adhesions have been reported as an isolated congenital anomaly as well as sequelae of various inflammatory diseases and infections. We believed that this is the first case report of tracheal web and fibrous band formation as a sequela of endotracheal tuberculosis. We believed that the fibrous band would have been the first to form, following which an infolding of mucosa would have developed from the left posterolateral tracheal wall toward the fibrous band giving form to a tracheal web. On the opposite right anterolateral wall, granulation tissue developed and gradually grew inwards toward the fibrous band with the remaining distance covered by a mucosal web leading to near-complete occlusion of whatever lumen was left lying in between the latter and the fibrous band. The inability to visualize the right upper lobe lumen may also be due to its occlusion by a combination of adhesion bands and mucosal web.

Management of central airway stenosis usually involves an initial attempt by bronchoscopy (both flexible and rigid) assisted by various techniques such as balloon dilatation, electrocautery, or neodymium-doped yttrium aluminum garnet laser with or without airway stenting. Patients after bronchoscopic interventions ideally should be followed up regularly in the initial 2 years to assess for recurrence of stenosis. Patients with complex lesions and failure of initial bronchoscopic assisted techniques should be taken up for surgical correction. Our patient,
though has developed restenosis, continues to remain asymptomatic and is on regular follow-up.

**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. Siow WT, Lee P. Tracheobronchial tuberculosis: A clinical review. J Thorac Dis 2017;9:E71-7.
2. Chung HS, Lee JH. Bronchoscopic assessment of the evolution of endobronchial tuberculosis. Chest 2000;117:385-92.
3. Shim YS. Endobronchial tuberculosis. Respirology 1996;1:95-106.
4. Park IW, Choi BW, Hue SH. Prospective study of corticosteroid as an adjunct in the treatment of endobronchial tuberculosis in adults. Respirology 1997;2:275-81.
5. Um SW, Yoon YS, Lee SM, Yim JJ, Yoo CG, Chung HS, et al. Predictors of persistent airway stenosis in patients with endobronchial tuberculosis. Int J Tuberc Lung Dis 2008;12:57-62.
6. Cary C, Jhajj M, Cinicola I, Evans R, Cheriyath P, Gorepatti VS. A rare case of fibrostenotic endobronchial tuberculosis of trachea. Ann Med Surg (Lond) 2015;4:479-82.
7. Galluccio G, Lucantoni G, Battistoni P, Paone G, Batzella S, Lucifora V, et al. Interventional endoscopy in the management of benign tracheal stenoses: Definitive treatment at long-term follow-up. Eur J Cardiothorac Surg 2009;35:429-33.
8. Duhamel DR. editor. Bronchial webs and adhesions. In: Duhamel DR, Harrell JH, editors. Clinical Atlas of Airway Diseases: Bronchoscopy, Radiology and Pathology. Ch. 63. Philadelphia, PA: Elsevier Saunders; 2005. p. 202.
9. Takayama S, Miura H, Kimula Y. A case of ‘bronchial string’ – A rare anomaly of the bronchus. Respiratio 1991;58:115-6.
10. Qiu XJ, Zhang J, Wang T, Pei YH, Xu M. Nonstent combination interventional therapy for treatment of benign cicatricial airway stenosis. Chin Med J (Engl) 2015;128:2154-61.
11. Wong JL, Tie ST, Samril B, Lum CL, Rahman MR, Rahman JA. Successful treatment of tracheal stenosis by rigid bronchoscopy and topical mitomycin C: A case report. Cases J 2010;3:2.
12. Amat B, Esselmann A, Reichle G, Rohde HJ, Westhoff M, Freitag L. The electrosurgical knife in an optimized intermittent cutting mode for the endoscopic treatment of benign web-like tracheobronchial stenosis. Arch Bronconeumol 2012;48:14-21.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.