Hemoptysis due to Tracheal Diverticulum

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Abstract

Tracheal diverticulum is a rare entity with only 79 symptomatic cases reported till date. We herein describe the case of a 38 year old male who presented with recurrent dry cough and hemoptysis and was diagnosed to have tracheal diverticulum on High Resolution Computed Tomography (HRCT) of chest. This was further confirmed on fibre optic bronchoscopy.

Introduction

Tracheal diverticulum is a rare benign condition characterised by invagination of tracheal wall resulting in paratracheal air cyst. Tracheal diverticulum may be congenital or acquired, the difference residing mainly in the histological features of the wall.¹ It is usually discovered incidentally in an asymptomatic patient as an outpouching from tracheal wall, usually on the right side.²

Case Report

A 38 year old male, a non-smoker, teacher by profession, with no significant past medical or surgical history presented to us with a two day history of fever, cough with purulent expectoration and streaky hemoptysis. He also reported that this was his fourth episode of cough and fever in last nine months and it was accompanied by streaky hemoptysis each time. On examination he was hemodynamically stable and on auscultation his chest was clear. The haemogram and biochemical parameters were in the normal range. Sputum examination for acid-fast bacilli was negative. His X-ray chest was normal. HRCT (Figure 1) of chest showed a 2.2 X 1.2 centimeter (cm) diverticulum arising from the right postero-lateral wall of trachea at the level of second thoracic vertebra. A fiber optic bronchoscopy (Figure 2) was done and a wide mouth opening was seen on the right postero-lateral wall of trachea. The opening was covered with secretions and blood clots which cleared on suctioning. A shallow diverticulum could be seen which bled on touch, thus confirming that this diverticulum was the cause of hemoptysis in this patient. Rest of the tracheobronchial tree was normal on bronchoscopy. Two-dimensional echocardiography was within normal limits. Patient was treated with a 5 day course of amoxycillin-clavulanate. Patient responded well to conservative management.

Discussion

Tracheal diverticulum is also called paratracheal air cyst and is characterized by single or multiple outpouchings of the tracheal wall. It was first described by Rokitansky in 1838.³ These are rare incidental findings on radiology, mostly seen on HRCT of chest.⁴ Tracheal diverticulum may be congenital or acquired.

Congenital tracheal diverticulum is usually single and more common in males. They are usually small and narrow-mouthed and may occur in isolation or in association with other congenital anomalies within the tracheobronchial tree. They may arise 4 to 5 cm below the vocal cords or a few cm above the carina. The exact mechanism for formation of congenital tracheal diverticulum is unclear. It is likely that tracheal diverticulum develops secondary to altered embryonic development where a malformed supernumerary branch of trachea develops. The wall of a congenital tracheal diverticulum is similar to the actual tracheal wall, containing smooth muscle fibres, cartilage and respiratory epithelium.⁵

Acquired tracheal diverticulum, presents with equal incidence in both genders, and can develop anywhere in the course of trachea on the postero-lateral wall where cartilage rings are deficient.³ They are wide-mouthed and larger in size than the congenital diverticula and are most common on right side. The supportive presence of oesophagus and aortic arch on left side makes the left side less susceptible for formation of a diverticulum. The development of acquired tracheal diverticulum is related to raised intrathoracic pressure, which causes mucosa to herniate at the weakest point. Therefore, they consist of respiratory epithelium without smooth muscle or cartilage and may be single or multiple. Most likely mechanism of formation of a diverticulum is prolonged increased

Fig. 1: HRCT-showing paratracheal air cyst

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intra-thoracic pressure, for example, as caused by chronic cough or by frequent shouting.2

Tracheal diverticulum is usually asymptomatic. But sometimes diverticulum can retain secretions and become secondarily infected resulting in recurrent episodes of tracheobronchitis.1 This may be associated with cough, dyspnoea and hemoptysis. Since most of the tracheal diverticula are asymptomatic or do not cause significant symptoms, a conservative symptomatic medical treatment with antibiotics and mucolytics usually suffices and very rarely a surgical resection is required.6,7

Our patient was a teacher and had history of frequent shouting and speaking at high pitch for long hours which could have increased the pressure in his trachea and predisposed him to developing tracheal diverticulum. The duration of symptoms in our patient was only 9 months. On bronchoscopy our patient had wide mouth opening in right postero-lateral wall of trachea which bled on touch and no other anomaly of the tracheobronchial tree was found. Since these features go in favour of an acquired diverticulum, it appears that our patient’s diverticulum was of an acquired variety and was the cause of his hemoptysis.

Conclusion

Tracheal diverticulum can infrequently present with hemoptysis and clinicians should keep this in mind while investigating patients of hemoptysis.

References