Case Report

Tracheal diverticulum

Case report of an asymptomatic male patient

Panagiotis Sideris[1],
Sofia Voidila[2],
Panagiotis Patrinos[3]

[1]Internist,
[2]Radiologist,
[3]Resident Doctor in Internal Medicine,
General Hospital of East Achaia, Aigio, Greece

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- Diverticulum
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Correspondence:
Sofia Voidila, Radiologist,
General Hospital of East Achaia, Aigio, Greece
11 Stratigon Street, 200 06 Poulitsa, Korinthos, Greece
Tel.: 6971532528
E-mail: sofiavoidila5@gmail.com

ABSTRACT
Tracheal diverticulum is a rare malformation. It is usually detected incidentally by imaging methods and it must be included into the differential diagnosis of any paratracheal air cyst at the thoracic inlet (collections of extraluminal paratracheal gas). It is commonly asymptomatic and does not require special treatment. The incidence of tracheal diverticulum is 2.4%. Tracheal diverticulum is divided into two subgroups: congenital and acquired. We report a case of a 75-year old man with tracheal diverticulum accompanied with a review of the relevant literature.
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INTRODUCTION

The paratracheal air cysts include various entities. The physician's suspicion is orientated in most cases to the digestive system, although the cause could be some rare anomalies arising from the respiratory system. One of these is tracheal diverticulosis. Others include tracheocele, lymphoepithelial cysts, and bronchogenic cysts. Tracheal diverticulum is a type of paratracheal air cyst with an incidence of 2.4%[1]. It is asymptomatic in most of the cases and is usually detected incidentally by imaging methods or post-mortem. It consists of small collections of air in the paratracheal region lined by ciliated columnar epithelium. Tracheal diverticulum is most commonly located at the right posterolateral region of the trachea in about 97% of cases[1]. The main reason is, that on the left of the trachea is the esophagus, which provides support, thus making the wall of the right side more buoyant.

CASE PRESENTATION

A 75-year old male patient was hospitalized after presenting possible respiratory infection with productive cough and without fever. He presented additional breath sounds on physical examination of the lungs. The patient was a smoker and has a history of chronic obstructive pulmonary disease. He was subjected to chest X-ray and a CT scan of the chest. Chest CT scan

was performed with 3 mm sections without intravenous contrast agent administration. Axial images of the chest showed an air-filled formation located at the upper mediastinum, with a maximum diameter of 3.1 cm, which seems to communicate with the trachea by means of a peduncle (Figure 1).

EPIDEMIOLOGY

Tracheal diverticulum is a rare and benign entity defined by one or more sachet cavities outpouching from the wall of the trachea. It was first described by Rokitansky in 1838[1]. A report of the largest series of 64 cases, carried out by Goo et al, appears in up to 1% of autopsies. Buterbaugh and Erly estimated that they can occur in approximately 3.7% of the population. It is usually located on the right aspect of the trachea at the level between the vertebrae T1 and T3. The average size of the diverticulum is 4 mm. Its wall may be either thin or thick. The mean age of patients with tracheal diverticulum is 58 years, while the average age of patients with paratracheal air cysts is 55 ± 16.6. It is more common in males (64%) than in females (36%)[1]. However, paratracheal cysts are more common in women than in men. There are many different studies in the literature that evaluate the relationship between tracheal diverticulum and bronchial or lung diseases, such as COPD (chronic obstructive pulmonary disease).

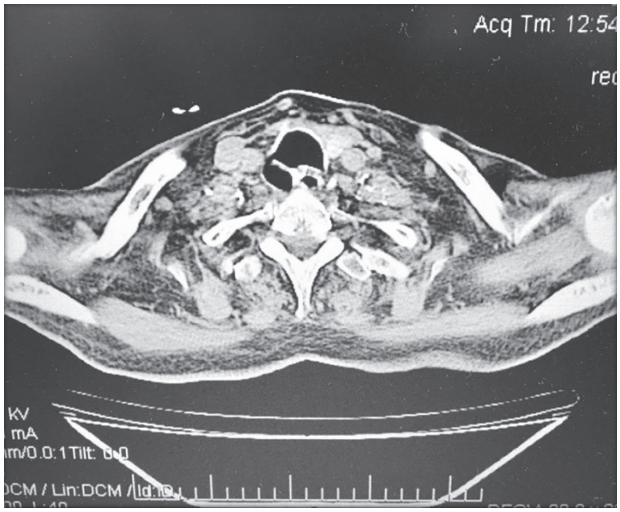

FIGURE 1. Air-filled tracheal diverticulum located at the right paratracheal area at the level of T1 vertebra.

CLASSIFICATION

The tracheal diverticulum is divided into two types, congenital and acquired.

Congenital is more common in men than women, it is small in diameter and it communicates through a small tract with the tracheal lumen. It is histologically similar to the trachea and represents a supernumerary tracheal branch 4-5cm below the vocal cords or just above the carina. The congenital tracheal diverticulum arise either from a defect in the differentiation of the endoderm during the development of the posterior tracheal wall membrane or from a defect in the development of tracheal cartilage during the sixth week of fetal life. It affects the entire anatomy of the trachea (respiratory epithelium, smooth muscle and cartilage) and often fills with mucus. It is rarely associated with other congenital malformations, such as tracheoesophageal fistula.

Acquired can occur at any level of the trachea. Moreover, it can be multiple, broader and larger in size than congenital. Histologically, it includes only respiratory epithelium and not smooth muscle or cartilage. Usually there are outpouchings on the tracheal wall located between the extra- and intrathoracic trachea. Long-term increased intratracheal pressure due to chronic cough or chronic obstructive pulmonary disease (COPD) in association with a weakened wall can cause acquired diverticulosis. Acquired may also occur in consequence of complications from surgical procedures or tracheomalacia.

Mounier-Kuhn's syndrome is a rare disease and is characterized by multiple tracheal diverticula, major bronchial and tracheal stretching, bronchiectasis and recurrent episodes of lower respiratory tract infection[9].

CLINICAL PRESENTATION

Although it is mostly asymptomatic, its presence in symptomatic patients has been associated with chronic cough, recurrent episodes of hiccups, voice hoarseness, wheezing, cough, dyspnoea, odynophagia and dysphagia, respiratory infections and difficulty in placement of tracheal tube (three cases have been described worldwide)[5]. Tracheal diverticulum can also cause dysphonia due to recurrent paralysis caused by direct compression of it. If it is infected it can also lead to paratracheal abscess.

There is a case report of pneumomediastinum as a result of perforation of a tracheal diverticulum caused by tracheal intubation[8].

DIAGNOSIS

Computed tomography examination, including thin sections or reconstructed images, is the proper imaging method for the study of tracheal diverticulum. It is useful for locating, calculating the size, contour and thickness of the tracheal tract wall. It can also demonstrate the connection between the diverticulum and the tracheal lumen. Especially sagittal images are particularly useful. Furthermore, it can be used to distinguish congenital and acquired ones, depending on the presence or absence of cartilage and the size of the neck of the diverticulum. For detailed imaging of tracheal diverticulum the thickness of slices of chest CT should be less than 1mm[4].

Bronchoscopy can also establish diagnosis, but it is an invasive procedure. In addition, diverticula with a narrow opening or just a fibrous connection with the trachea can be bronchoscopically missed[10].

The diverticulum can be infected due to recurrent upper respiratory tract infections. This infected diverticulum can lead to paratracheal abscess. If it is infected, it can be enhanced after intravenous contrast agent administration. Infection may also progress into empyema or subphrenic abscess. Differential diagnosis of Zenker's infected diverticulum is difficult, and endoscopic upper gastrointestinal system may be required if communication with the trachea in chest CT is not apparent.

TREATMENT

Treatment is not indicated in asymptomatic patients. In symptomatic patients therapeutic approach should be based on age, co-morbidity, and clinical presentation. The treatment of choice in symptomatic patients is usually surgical resection. This can be done without thoracotomy but with lateral cervical access. In addition, endoscopic cauterizations with laser or electrocoagulation are used. For elderly patients conservative treatment is preferred with use of antibiotics, mucolytic agents and respiratory physiotherapy[2].

Particularly for the acquired diverticula, surgical treatment is not always beneficial. The prevention of infections is usually preferred in patients with multiple tracheal and wide-spread diverticula. For congenital, the surgical resection is preferred due to the long-term accumulation of mucus inside them and potential risk of infection. However, for patients with congenital tracheal diverticulum who undergo surgery there is a risk of injury of the esophagus or the laryngeal nerve[3].

Patients with paratracheal abscess and respiratory distress should have an emergency intubation and surgical drainage.

CONCLUSIONS

The tracheal diverticulum should be included in the differential diagnosis of paratracheal air cysts. CT chest scan is the imaging method of choice for its diagnosis. However, predisposing factors (more common in men, COPD or chronic cough) should also be considered. The therapeutic approach depends on the existence of symptoms, age and co-morbidity. In this patient, a possible association of tracheal diverticulum with respiratory infection or COPD should be considered. Lastly, it should also be taken into account whether the type is congenital or acquired, as the surgery is not in all cases beneficial.

CONFLICT OF INTEREST
None.

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ΠΕΡΙΛΗΨΗ

Εκκόλπωμα τραχείας. Περίπτωση ασυμπτωματικού άρρενος γηριατρικού ασθενούς

Παναγιώτης Σίδερης[1], Σοφία Βοϊδήλα[2] , Παναγιώτης Πατρινός[3]

[1]Ιατρός Παθολόγος, [2]Ιατρός Ακτινολόγος, [3]Ειδικευόμενος Ιατρός Παθολογίας,
Γ.Ν. Ανατολικής Αχαΐας, Αίγιο

Το εκκόλπωμα τραχείας είναι μια σπάνια δυσπλασία. Ανιχνεύεται συνήθως τυχαία με τις απεικονιστικές μεθόδους και πρέπει να συμπεριληφθεί στην διαφορική διάγνωση οποιασδήποτε παρατραχειακής κύστης

αέρα στην είσοδο του θωρακικού κλωβού (συλλογές αέρα παρατραχειακά). Είναι συνήθως ασυμπτωματική και δεν απαιτεί ειδική θεραπεία. Η επίπτωση του εκκολπώματος τραχείας είναι 2,4%. Υπάρχουν δύο τύποι: συγγενής και επίκτητος. Αναφέρουμε μια περίπτωση ενός 75χρονου άντρα με τραχειακό εκκόλπωμα, με συνοδό ανασκόπηση της σχετικής βιβλιογραφίας.

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Λέξεις - Κλειδιά: *Εκκόλπωμα, Τραχεία, Παρατραχειακή κύστη, Συγγενές, Επίκτητο*

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