

Traqueal Diverticulum: An unusual presentation of an underrecognized condition

Published on 04.01.2024

DOI: 10.35100/eurorad/case.18415

ISSN: 1563-4086

Section: Chest imaging

Area of Interest: Thorax

Procedure: Contrast agent-oral

Procedure: Perception image

Imaging Technique: Conventional radiography

Imaging Technique: CT

Imaging Technique: Fluoroscopy

Special Focus: Diverticula Case Type: Clinical Case

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Patient: 56 years, female

Clinical History:

The patient presented with a chronic cough, dysphagia, and heartburn. It was referred for an oesophagus contrast-barium study to investigate and exclude gastric reflux disease.

Imaging Findings:

The contrast study showed the esophagus, in the upper third near the thoracic inlet, deviated to the left by a hyperlucent oval area, which was surrounded by thin walls, suggesting a cyst with gas content. Although there was oesophagal deviation, this lesion did not cause significant oesophagal stenosis or delay in contrast progression.

A CT was performed to characterise this lesion, which revealed a right posterior paratracheal air cyst at the thoracic inlet. Communication with the tracheal lumen was seen, making the diagnosis of a Tracheal Diverticulum.

Discussion:

The tracheal wall comprises mucosa, submucosa, cartilage or muscle, and adventitia. Horseshoe-shaped bands of hyaline cartilage support the anterior and lateral tracheal walls [1]. The posterior tracheal wall lacks cartilage and is supported by the trachealis muscle, forming the posterior tracheal membrane. The right side of the trachea is relatively weaker, while the left side is more resistant because of the support provided by both the oesophagus and the aortic arch [2]. Chronic cough or obstructive lung diseases, increase intratracheal pressure, making it more susceptible to the formation of a tracheal diverticulum (TD), preferentially on the right posterior side near the thoracic inlet [3].

They are classified as congenital or acquired based on their anatomical location. Congenital TD, often smaller and located below the vocal cords or above the carina, results from developmental defects. Acquired TD, larger and resulting from increased expiratory pressures or tracheomalacia, lacks a muscular layer and cartilage, appearing as pseudo-diverticula [4].

TD is relatively common, found in approximately 3.7% – 5.7% of the population[2,3]. It is often asymptomatic, discovered incidentally during Computed Tomography (CT) scans for investigating pulmonary symptoms. Some patients may experience chronic cough, dyspnea, stridor, or recurrent tracheobronchitis[2]. Although TD is related to increased intratracheal pressure, which is usual in obstructive lung diseases, previous studies show no significant association between emphysema and TD [2,3].

Imaging, particularly CT, is crucial for diagnosing TD. It evaluates its localization, size, and wall thickness. TD typically appears as a paratracheal thin-walled air cyst, with or without communication to the tracheal lumen, located most commonly near the thoracic inlet at the level between the T1 and T3 vertebrae[1]. Bronchoscopy, although invasive, can aid in diagnosis, but cases with a very narrow opening or fibrous tract may not be revealed[4].

Treatment is not necessary in asymptomatic patients. However, surgical resection is often the treatment of choice in symptomatic cases, especially for young patients with long-term accumulated mucous in the lesion[2,4]. Careful surgical resection is crucial to avoid injury to the laryngeal nerve and oesophagus. Infections can occur in TD, progressing to a paratracheal abscess [4].

Radiologists should recognize and describe right-sided paratracheal air cysts as a common finding, avoiding confusion with pneumomediastinum. While clinical importance may be limited, understanding TD characteristics aids in proper diagnosis and treatment decisions, especially in symptomatic cases[2,4].

Differential Diagnosis List: Laryngocele, Tracheal Diverticulum, Zenker's Diverticulum, Lung bullae

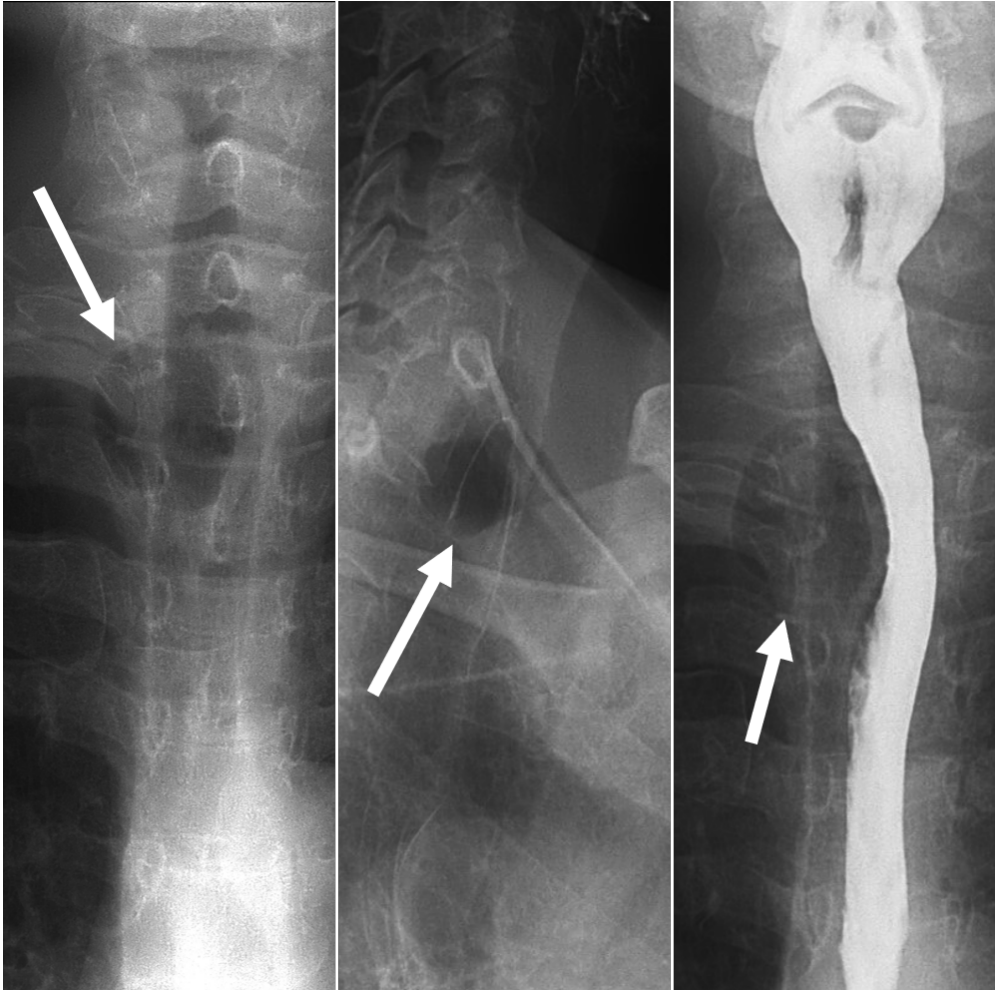
Final Diagnosis: Tracheal Diverticulum

References:

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Figure 1

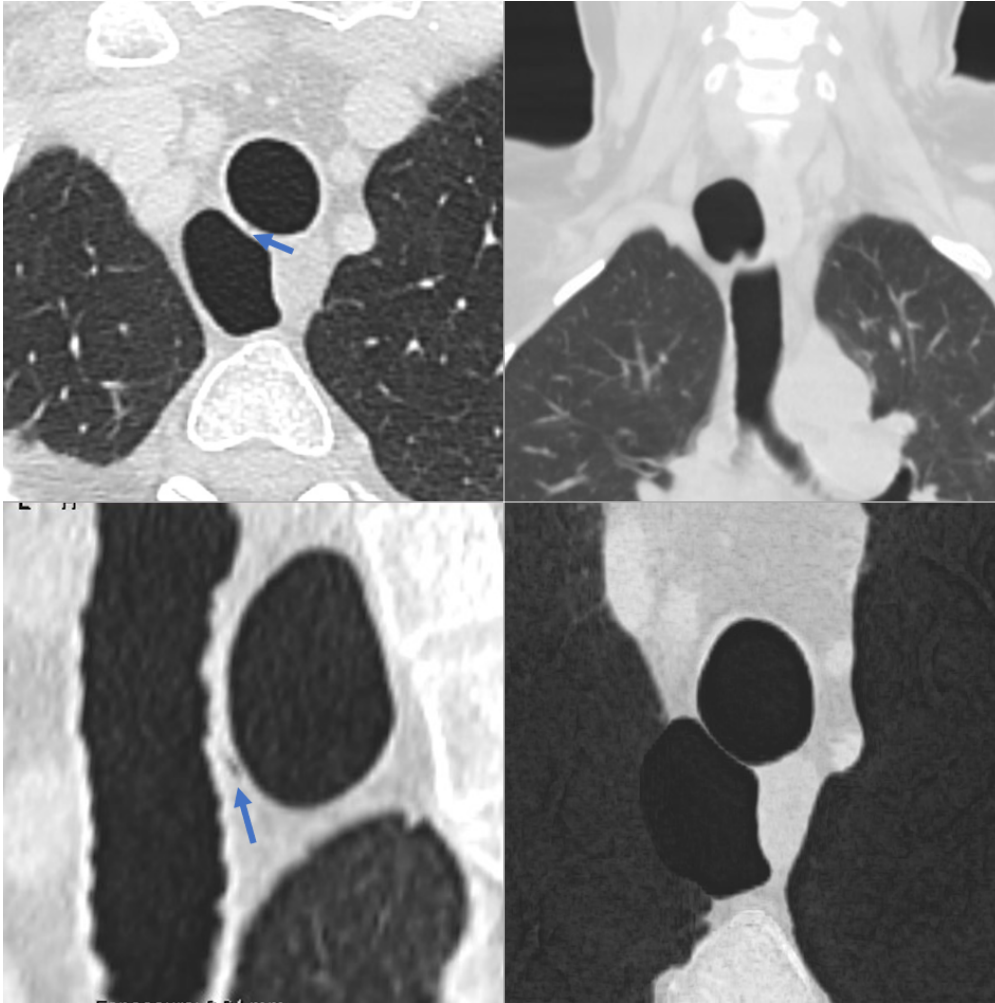
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Description: Radiographs showing a thin wall air cyst located right posterolateral to the trachea, at the level of the thoracic inlet. Contrast study of the oesophagus showing deviation by the tracheal diverticulum. **Origin:** © Department of Radiology, Centro Hospitalar de Lisboa Ocidental, Lisbon, Portugal, 2023

Figure 2

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Description: CT images (lung window and MinIp) showing a right posterolateral paratracheal air cyst, with thin walls and gas content. Note the communication of the cyst with the trachea (arrow), making the diagnosis of tracheal diverticulum. **Origin:** © Department of Radiology, Centro Hospitalar de Lisboa Ocidental, Lisbon, Portugal, 2023