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A Case of Symptomatic Tracheal Diverticulum and Surgical Resection as a Treatment Modality

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Tracheal diverticulum is often diagnosed incidentally and, due to its rarity, there is no standard treatment. It is a benign entity, but has the potential to cause specific symptoms, such as chronic upper respiratory infection and chronic cough. Symptomatic tracheal diverticulum can be medically treated, but likelihood of recurrence is high. We report a case of surgical resection of symptomatic tracheal diverticulum to prevent recurrence.

Key words: 1. Tracheal diseases/therapy
2. Tracheal diverticulum

Case report

Tracheal diverticulum is a benign entity rarely encountered in clinical settings. Patients are often diagnosed incidentally during evaluation for other conditions. This condition is divided into acquired tracheal diverticulum and congenital tracheal diverticulum; the difference between the two types is reflected in the tissue histology. In congenital tracheal diverticulum, a congenital defect arises in the process of tracheal membrane formation during the sixth week of fetal life. Acquired tracheal diverticulum does not have a clear cause [1]. The most common location of origin is the right posterolateral aspect of the trachea at the T1–T2 level [2-4]. The current treatment of choice for incidentally observed tracheal diverticulum is medical treatment, for both symptomatic and asymptomatic cases. When the diverticular sac begins to act as a reservoir for secretions, it becomes a potential source of infection, potentially resulting in in upper respiratory tract infections. A large inflated or secretion-filled sac may exert a mass effect on the adjacent nerve structures (e.g., recurrent laryngeal nerve compression causing dysphonia) [5,6]. Surgical intervention is an effective treatment when indicated symptoms are present. We present the first detailed case report in Korea of transcervical surgical resection as the treatment of choice for a symptomatic tracheal diverticulum.

A 65-year-old woman was admitted to Gangnam Severance Hospital with known bilateral papillary thyroid cancer that was scheduled to be surgically treated. She had no other underlying conditions and the thyroid cancer was diagnosed during her routine annual check-up. During the preoperative computed tomography (CT) scan, a 2.5-cm air cyst was observed on the right posterolateral tracheal wall at the T2 level, most likely a tracheal diverticulum (Fig. 1).

The patient reported a chronic productive cough that had lasted throughout the year, and this symptom was present during her preoperative evaluation. Since she considered it to be irrelevant to the thy-

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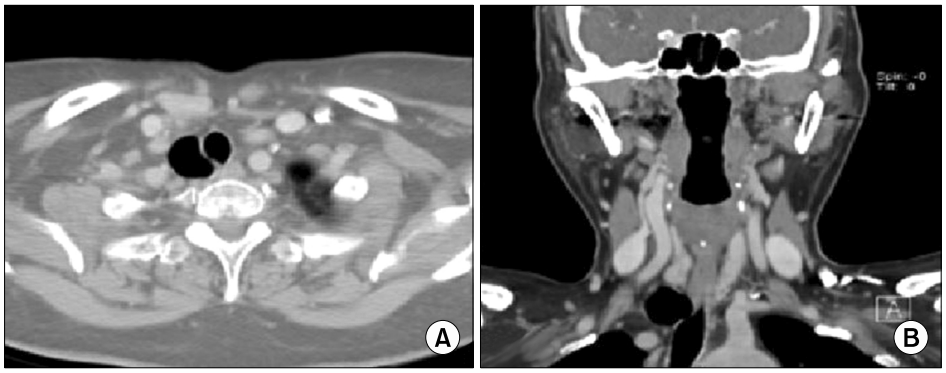

Fig. 1. (A, B) Initial preoperative computed tomography scan showing the tracheal diverticulum positioned on the right posterolateral aspect of the trachea.

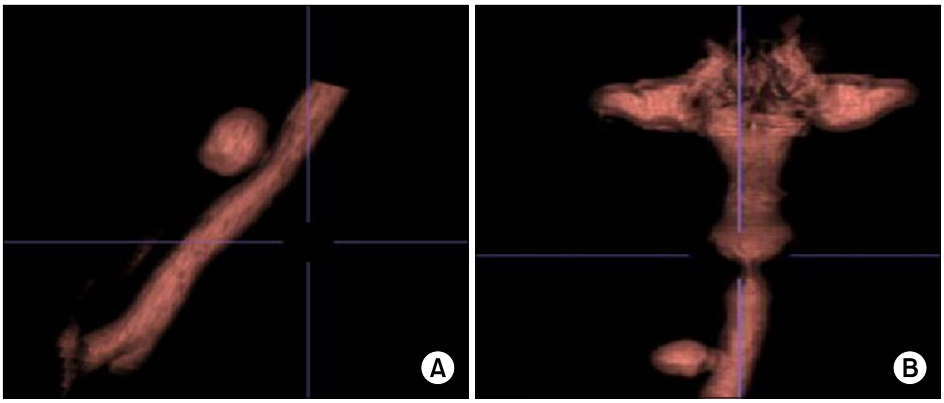

Fig. 2. (A, B) Three-dimensional reconstruction from the initial preoperative computed tomography scan showing the tracheal diverticulum with a communication tract.

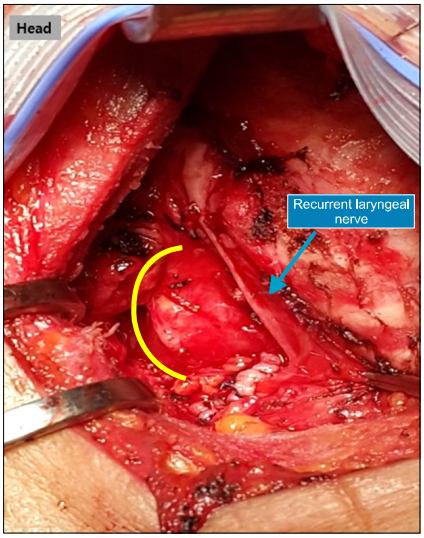

Fig. 3. Intraoperative view of the tracheal diverticulum (yellow line) and recurrent laryngeal nerve (blue arrow).

roid cancer, the patient omitted a past medical history of annually recurrent upper respiratory tract infections, which had required 2 admissions for inpatient medical treatment. Further evaluation with magnetic resonance imaging and a bronchoscope was performed. A bronchoscopic evaluation was normal and revealed no communicating channel within the tracheal lumen. Our radiology department also completed a 3-dimensional reconstruction of the trachea (Fig. 2). The surgeon's main concern in decision-making regarding treatment was the presence of daily symptoms and recurrent upper respiratory infections, for which the most probable culprit was the tracheal diverticulum.

Concomitant operations for a bilateral thyroidectomy and a tracheal diverticulectomy were scheduled. The operation began with right total thyroidectomy via a transcervical approach, which provided a sufficient operative field window to expose the sac attached to the trachea. Once the surrounding tissue was dissected down to the tracheal wall, a communicating stalk between the diverticulum and the tracheal wall was observed (Fig. 3).

Simple amputation of the stalk and primary suture repair of the tracheal wall were performed. The general surgery team then proceeded with rest of the bilateral thyroidectomy. The pathological diagnosis was

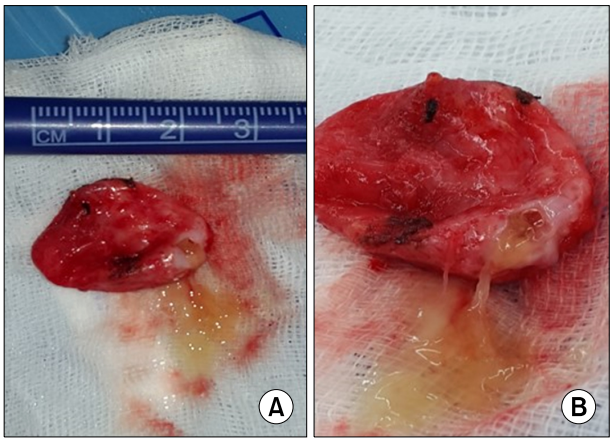

Fig. 4. (A, B) Secretion-filled resected tracheal diverticulum with a communication opening. The opening was exposed after amputation of the neck connected to the trachea.

acquired diverticulum, composed mainly of tracheal mucosal membrane tissue (Fig. 4). The absence of smooth muscle and cartilage confirmed the diagnosis. The diverticular sac measured 2.5×2.1×0.4 cm, and was filled with mucus and air. No postoperative complications and the patient was discharged on postoperative day 4. No postoperative follow-up CT images were obtained, but the patient was free of productive cough at a 4-month outpatient follow-up visit.

Discussion

The literature on tracheal diverticulum is minimal, and few studies have discussed the surgical management of tracheal diverticulum. Fewer than 20 symptomatic cases have been reported in which the disorder was accompanied by symptoms such as hemoptysis, dyspnea, dysphagia, trachea-bronchitis, or stridor. Not all of these patients underwent surgical resection [6].

Tracheal diverticulum is often diagnosed incidentally, and CT imaging is an effective and affordable diagnostic tool. Bronchoscopy is another main diagnostic tool. It is useful to confirm the diagnosis by identifying the communication opening between the air sac and tracheal wall. When the communication opening is narrow or is composed solely of fibrous tract, it may not always be found by bronchoscopy [4]. Acquired tracheal diverticulum differs from congenital tracheal diverticulum in location, size, and histopathology. Acquired tracheal diverticulum has a wide opening and can be found at any level in the thoracic cavity. The proposed cause is the herniation of the weakened tracheal wall due to increased luminal pressure in the trachea, such as in the environment observed in chronic obstructive pulmonary disease [2]. The histopathological difference is the presence of smooth muscle and cartilage; acquired tracheal diverticulum lacks these structures.

Acquired and congenital tracheal diverticula are often asymptomatic and conservative care is an adequate treatment. However, surgical treatment has been reported to be effective and safe for symptomatic tracheal diverticula [7]. Endoscopic laser cauterization can also be considered. Either a medical or surgical approach can be chosen according to the age of the patient and the presence of co-morbidities. Due to the rarity of these cases, consensus regarding indications for treatment is still needed. We report a case of successful surgical intervention for symptomatic tracheal diverticulum as a contribution to the literature.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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