An Unexpected Finding of a Bronchogenic Cyst Presenting as a Thyroid Mass

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Abstract Herein we present a case of a bronchogenic cyst masquerading as a thyroid mass. Bronchogenic cysts are rare congenital malformations that result from an abnormal development of the ventral foregut during organogenesis. They are commonly asymptomatic lesions rarely found in the neck. In our case, a young male presented with complaints of neck discomfort over a long period presumed to be secondary to a thyroid mass based on imaging studies. Fine needle aspiration was inconclusive. Post-operative pathological sectioning revealed evidence of a bronchogenic cyst. These lesions have a low incidence of malignancy, and complete surgical excision has been recommended.

Keywords Thyroid · Bronchogenic cyst · Neck mass · Congenital malformation

Background

During embryological development of the ventral foregut, a rare congenital malformation may form secondary to abnormal budding of the tracheobronchial tree at the time of organogenesis. These bronchogenic cysts are most commonly found in the mediastinum, accounting for 6–15% of mediastinal tumors, and rarely in the neck [1]. They generally present as asymptomatic lesions in younger patients. Those in the thyroid or perithyroid region are very rare with only a few cases cited to date [3]. We herein

present a rare case of a bronchogenic cyst mimicking a painful thyroid mass.

Case Report

A 30-year-old male presented with the complaint of neck discomfort secondary to a thyroid mass that had been present for many years. Prior evaluation by his primary care doctor included a sonogram, which revealed a right-sided solid nodule of the thyroid. A thyroid scan was subsequently performed and this showed a cold isthmus nodule. The patient had no history of radiation exposure, no symptoms of hyperthyroidism or hypothyroidism nor any difficulty breathing. Review of systems was otherwise within normal limits. He denied any smoking or alcohol consumption. On physical examination, the patient had a smooth, mobile, 5 cm mass of the right thyroid gland that approached the midline of the neck. No other palpable nodes were present in the neck. A fine-needle biopsy of the mass was performed and yielded yellow fluid, consistent with a cyst. Fiberoptic laryngoscopy was normal. The exact nature of the mass was not clear, and since the patient had significant discomfort, a thyroid resection was planned.

Three months later, the patient underwent surgical exploration of the neck, which revealed a right thyroid mass extending to the isthmus that appeared cystic and fluctuant with fibrous adhesions to the surrounding tissue. A resection of only the mass itself was performed. Grossly, the mass (30 g and 5 cm in greatest dimension) was fluctuant, gray-tan, and globular. Serial sectioning revealed a unilocular cyst filled with viscid, gray fluid. Microscopically, the cyst lining had pseudostratified columnar epithelium with prominent, uniform cilia. Beneath this epithelium were bronchial-type seromucinous glands, and a

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peripheral rim of mature cartilage—the histologic appearance was of a normal bronchus (Figs. 1, 2). No other tissue types were identified. This histologic appearance was characteristic of a bronchogenic cyst. The post-operative recovery was uneventful.

Discussion

The esophagus and trachea develop during the third week of gestation as the primitive foregut is divided by lateral septa into the ventral (tracheal) and dorsal (esophageal) buds [2]. Bronchogenic cysts occur when the communication with the tracheobronchial tree is completely lost, although those in the mediastinum frequently remain attached. They may arise anywhere along the tracheoesophageal course, most commonly in the mediastinum or lungs. In very rare instances, such cysts may occur in the thyroid gland. This is likely secondary to budding that occurred during later stages of embryological development [3]. Usually these cysts present during childhood as isolated extrapulmonary, paratracheal masses [4]. Extrathoracic bronchogenic cysts have been reported in less than 10% of cases [5]. Irrespective of their location, bronchogenic cysts are usually asymptomatic but may produce symptoms of stridor, pain, fever, cough, or dyspnea due to compression of neighboring structures or secondary infection. Most cases are detected during routine radiographic imaging that shows abnormal shadowing [5].

The diagnosis of a bronchogenic cyst is made based on histopathologic features. The lining of these cysts is comprised of pseudostratified ciliated columnar epithelium. The wall may also have interspersed areas of smooth muscle, mucus-secreting goblet cells, cartilage, and dystrophic calcification [5, 6]. Not all of these features need to be present in order to make the diagnosis.

Fig. 2 High-magnification showing bronchial-type seromucinous glands that were beneath the epithelium. Note the abundant mucin content of some cells

The differential diagnosis of cervical bronchogenic cysts includes thyroglossal duct cysts, parathyroid cysts, thyroid cysts, cervical thymic cysts, cystic hygromas, dermoid cysts, teratomas, and cystic neuromas [5]. In our case, it was difficult to clinically distinguish a thyroid adenoma or cyst from a bronchogenic cyst. The diagnosis was confirmed by microscopic examination of the specimen showing many of the typical features of a bronchogenic cyst, as previously described.

In rare cases, bronchogenic cysts follow a malignant course [5]. Therefore, surgical resection is recommended. Complete resection is ideal, but since most cysts are

Fig. 1 **a** Low-power view of cyst lining showing pseudostratified ciliated columnar epithelium, better appreciated on high-magnification **(b)**

benign, radical resection should be avoided. In most cases, patients do well post-operatively.

In summary, our case highlights the possibility of a bronchogenic cyst in the differential diagnosis of a painful thyroid mass.

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