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Primary Bronchial Granular Cell Tumor in an Adult Male

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We report a rare case of granular cell tumor arising in the left lower lobe (LLL) bronchus with secondary obstructive change in a 60-year-old male. The patient was found to have a nodule in the LLL on a computed tomography scan, three months prior to his presentation to the Asan Medical Center. Bronchoscopic biopsies revealed a granular cell tumor. After undergoing LLL lobectomy with bronchoplasty, the patient has not experienced any tumor recurrence.

Key words: 1. Granular cell tumor
2. Bronchial tumor

CASE REPORT

A 60-year-old male was referred to the Asan Medical Center for a nodule in the left lower lobe (LLL). The nodule was incidentally detected during the preoperative evaluation of gallstone, for which he underwent laparoscopic cholecystectomy at an outside hospital three months prior to his presentation to us. On his visit, he did not have any respiratory complaints such as productive cough or dyspnea. Medical history was unremarkable except hypertension. Further, the patient had been a non-smoker for 10 years although he used to smoke half a pack a day for 30 years before quitting.

We found that the patient's physical examination was unremarkable except decreased breath sounds over the left lower lung field. The laboratory data were all within normal limits. Chest X-ray and computed tomography scan revealed a mass having the following dimensions: 20×10×5 mm. The mass obstructed the secondary bronchus entering into the LLL, which resulted in a total collapse of LLL (Fig. 1). A flexible bronchoscopy showed an endobronchial mass filling the basal segments of the LLL (Fig. 2). Further, a biopsy indicated a granular cell tumor.

The patient underwent a left lower lobectomy via left posterolateral thoracotomy through the 5th intercostal space. The left thoracic cavity showed neither pleural adhesion nor seeding suggestive of malignancy. The LLL was heavily collapsed due to the obstruction by the endobronchial tumor. We divided the LLL bronchus at the level of the left upper lobe spur and performed a left lower lobectomy. The medial side of the left main bronchus was repaired using an interrupted anastomosis of 3-0 Vicryl. The resection margin of the bronchial stump was clear from the tumor on the frozen section. All five lymph nodes that were biopsied were tumor-free. The patient recovered well postoperatively and was discharged on postoperative day 5. Immunohistochemical staining demonstrated the positivity for S-100 protein, and the Ki-67 labeling index was low (1%), supporting the current diagnosis. The final pathology report confirmed the diagnosis of the granular cell tumor (Fig. 3). As of the writing of this

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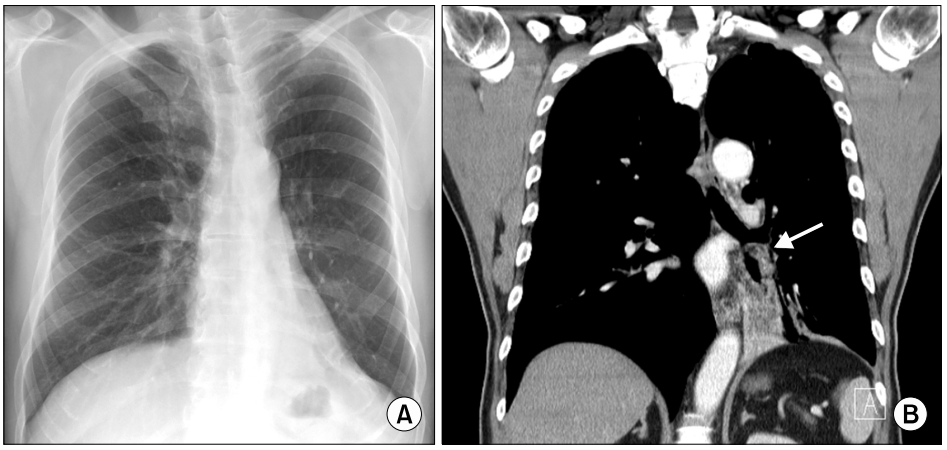

Fig. 1. (A) Preoperative chest X-ray and (B) chest computed tomography that show atelectasis of the left lower lobe. The endobronchial mass obstructing the left lower lobe bronchus is clearly visible (arrow).

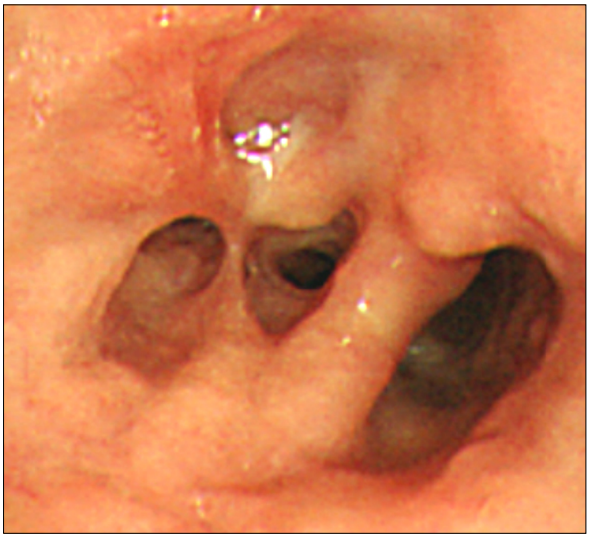

Fig. 2. Preoperative flexible bronchoscopy shows the endobronchial mass.

paper, the patient has been free of tumor recurrence for six months.

DISCUSSION

Granular cell tumor (GCT), a rare benign neoplasm that most commonly occurs in the tongue, skin, subcutaneous tissue, and breast, was first described by Abrikossoff in 1926. Pulmonary GCT, known to comprise 6% to 10% of all GTCs [1,2], was first reported by Kramer in 1938, and since then, less than 80 cases of GCT arising in the lung have been reported in the English-language literature [3]. In Korea, Seo et al. [4] first reported a bronchial GCT arising in the left main bronchus in 2006. It was traditionally termed 'granular cell myoblastoma' until the late 1980s after Abrikossoff suggested that GCT had a myogenic origin [5]. This traditional theory was challenged by subsequent electron microscopic and immunohistochemical studies [1,2]. Now, it is believed that GCT has a neural cell origin, thus establishing the current nomenclature.

Although it has been known that most pulmonary GCTs behave in a benign fashion, our review of the literature suggests that they have no unique clinical features. Most pulmonary GCTs are endobronchial, but sometimes, they can be located peripherally [6]. Pulmonary GCTs can be associated with synchronous extrapulmonary GCTs occurring in various organs, such as the tongue, kidney, or esophagus [1]. Pulmonary GCTs may occur metachronously in a single lung and thus, can be multicentric in 10% to 20% of the patients, although a majority of the GCTs tend to be solitary. Pulmonary GCTs can be associated with other malignancies or infectious diseases such as tuberculosis or human immunodeficiency virus [3]. Pulmonary GCTs can be diagnosed at any age, but most cases of pulmonary GCT present in the third or the fourth decade [1,2]. Previous clinical series showed that there is no gender predilection, and GCTs are equally distributed over both lungs with a predilection for the upper lobe [2]. However, another study found a slight predilection toward the left lung with a preference for the lower lobe, as presented in our case [1]. There are no commonly agreed risk factors, although the association of smoking with

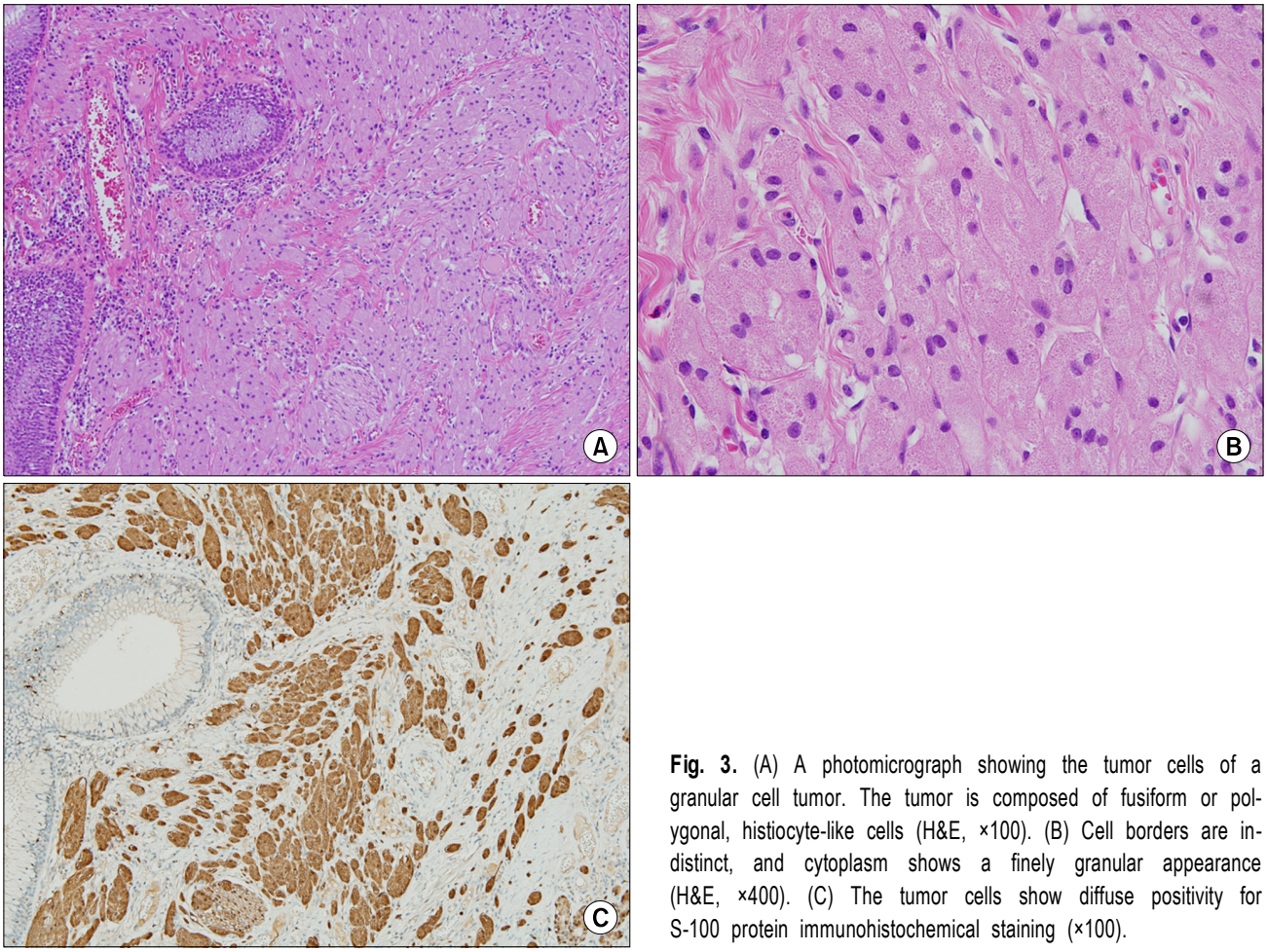

Fig. 3. (A) A photomicrograph showing the tumor cells of a granular cell tumor. The tumor is composed of fusiform or polygonal, histiocyte-like cells (H&E, ×100). (B) Cell borders are indistinct, and cytoplasm shows a finely granular appearance (H&E, ×400). (C) The tumor cells show diffuse positivity for S-100 protein immunohistochemical staining (×100).

pulmonary GCTs was hypothesized in some studies.

More than half of the GCT patients are asymptomatic at the time of diagnosis, and respiratory symptoms such as cough, dyspnea, hemoptysis, and wheezing present as tumor erosion and bronchial obstruction progress due to the growth of the endobronchial mass. With the onset of the symptoms, the bronchial obstruction causes the suppuration and destruction of the lung parenchyma distal to the obstruction; in this case, surgical resection is clearly indicated. However, the adequate treatment strategies for this disease remain controversial. Daniel et al. advocated bronchoscopic resection in asymptomatic patients with a tumor having a diameter of less than 8 mm [7], and van der Maten et al. [2] suggested that endobronchial therapy be the primary treatment. However, bronchoscopic removal cannot be a safe treatment option as it does not guarantee complete removal when GCTs infiltrate through the entire bronchial wall, which is evidenced by the fact that the incidence of recurrence was as high as 54% after bronchoscopic removal [7]. In addition, although extremely rare, it is possible that pulmonary GCTs can be malignant; the first case of malignant pulmonary GCT was reported in 2003 [8]. Being relatively young at the time of diagnosis can be a factor that favors complete surgical resection. In this regard, we believe that adequate surgical removal should be the preferred treatment option for all patients among whom GCTs are amenable to surgical resection. Based on the size, location, and number of masses, a surgical option, including either segmentectomy, lobectomy with or without sleeve resection, or rarely pneumonectomy, can be chosen with a lower incidence of recurrence and long disease-free survival.

CONFLICT OF INTEREST

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

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