Pulmonary Leiomyoma

-A case report-

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A 56 year old female patient was found to have a lung mass in the right upper lobe during evaluation for cough and sputum. The mass had grown slightly over the past 6 months when she was admitted for an operation. Preoperative studies revealed the benign nature of the tumor, and a thorascoscopic right upper lobectomy was performed. Postoperatively, the diagnosis was histologically proven to be pulmonary leiomyoma which is a rare type of benign lung tumor.

Key Words: Pulmonary leiomyoma, thorascoscopic, lobectomy

Benign tumors of the tracheobronchial tree comprise about 4% of all surgically excised tumors (Orlowski et al. 1978), and pulmonary leiomyomas are the rarest type among the benign neoplasms of the lung. Not more than 65 cases of leiomyoma in the lung, bronchus, and trachea have been reported in the world literatures. There is a slight preponderance of parenchymal localization over bronchial origin, and the tumor occurs most commonly in the fourth decade (ranges from 6 to 67 years with mean age of 37.2 years)(Taylor and Miller 1969; Vera-Roman et al. 1983; Hurt 1984; Arrigoni et al. 1970) with a female to male ratio of ~1.5:1. Most pulmonary leiomyomas originating from the lung parenchyma are detected incidentally in contrast to bronchial origins detected due to respiratory symptoms and irreversible lung damages. An accurate preoperative diagnosis is important in order to obviate extensive surgery. We present a case of pulmonary parenchymal leiomyoma in a 56 year old female who was treated by thorascoscopic right upper lobe lobectomy.

CASE REPORT

The patient is a 56-year-old female who

![Image](image-url)

Fig. 1. Preoperative chest P-A showing 5.0 x 5.0 x 5.0 cm sized solitary mass in the right upper lung field.

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was admitted for an evaluation of a pulmonary nodule in the right lung. She had had a physical check-up six months prior to an admission due to intermittent cough and sputum, and a plain chest x-ray showed a round $4 \times 4 \times 4$ cm sized solitary pulmonary nodule in the right upper lung. A follow-up chest x-ray taken 6 months later showed a slightly enlarged solitary pulmonary nodule in the right

![Fig. 2. Preoperative chest computerized tomogram showing $5.0 \times 5.0 \times 5.0$ cm sized irregular solitary mass in right upper lung field.](image)

![Fig. 3. Gross findings of cut section of leiomyoma in the right upper lobe.](image)

![Fig. 4. Microscopic findings showing diffuse proliferation and regular linear palisading of spindle cells (H & E $\times 100$).](image)
upper lobe (Fig. 1). Other than a history of treatment for pulmonary Paragonimiasis 20 years ago, she was relatively in good health. On physical examination, a slightly decreased breath sound without rale was heard on the right upper lung field. Computerized tomogram (CT) of the chest showed a noncalcified, discrete, lobulated mass lesion in the right upper lobe without any evidence of mediastinal lymphadenopathy (Fig. 2).

Fiberbronchoscopy revealed no abnormality in the bronchial mucosa, and no malignant cells were discovered in the subsequent needle aspiration biopsy. Routine laboratory tests were unremarkable and a lung function study showed a vital capacity of 3.02 liters and FEV1 of 2.37 liters which were in the normal ranges. The patient underwent videothoracoscopic resection because of presumptive clinical diagnosis of benign tumor. Upon thoracoscopic insertion, there was a round, firm, solid mass (5 × 4 × 4 cm) in the right upper lobe. A frozen section diagnosis of benign inflammatory pseudotumor was made, and thus thoracoscopic right upper lobectomy was performed (Fig. 3). Microscopically, the tumor mass is well demarcated from the respiratory mucosa and it is composed of a diffuse proliferation of interweaving bundles of spindle cells. Cellular pleomorphism or mitotic figures was not noted. The special stains specific for smooth muscle such as trichrome or phosphotungstic acid-hematoxylin reveal the proliferating spindle cells to be positive (Fig. 4). The postoperative course was uneventful and the patient was discharged on the fourth postoperative day, and she has been doing well during six months of follow-up.

DISCUSSION

Pulmonary leiomyomas account for about 2% of benign tumors of the lower respiratory tract. The locations of leiomyoma in the respiratory tract range from trachea, bronchus, to the parenchyme of the lung. Peripherally located pulmonary leiomyoma may arise from the smooth muscle of small bronchioles or smooth muscle of pulmonary vessels or ectopic foci of smooth muscle (Aakhus and Mylius 1962). However, others proposed that it is probably a benign tumor metastatized by penetrating into a blood vessel, and that intravascular seeding of tumor cells are from the primary uterine neoplasm (Proper and Simpson 1979).

In fact, all patients with "benign metastasizing leiomyoma" had a history of uterine leiomyoma (Horstmann et al. 1977; Boyce and Buddhdev 1973; Tench et al. 1978) and regression of these lesions observed during pregnancy or following oophorectomy (Banner et al. 1981) indicate hormonal dependence of these tumors as in the uterine leiomyoma and it lends support to the concept of "benign metastasizing leiomyoma". On the other hand, a controversy still continues as to whether the pulmonary nodules represent a true metastasis from an extremely well-differentiated leiomyosarcomas most commonly in the uterus, which is difficult to differentiate from its benign counterpart.

Leiomyoma occurs predominantly in the middle ages, with a mean age of 37.2 years for bronchial and parenchymal lesions and 40.6 years for tracheal lesions (Aakhus and Mylius 1962), although one third occur before the age of 20 years (Orlowski 1978). The relationship between sex and the type of leiomyoma has been reported; parenchymal leiomyoma occurs twice as often in females whereas tracheal leiomyoma occurs more often in males (Aakhus and Mylius 1962).

No specific symptoms and signs are associated with the disease although general respiratory symptoms such as hemoptysis, cough, fever, dysnea, and weight loss can be occasionally present. Physical signs and symptoms are closely related to the size, location of the tumor and subsequent changes in the lung distal to the lesion. The symptom becomes most pronounced when the tumor obstructs the lumen of the bronchus which then leads to pneumonitis, atelectasis and bronchiectasis.

Chest radiographs usually show an ovoid, well defined mass lesion which leads to air trapping and atelectasis distally. In patients with these radiographic findings and clinical symptoms, fiberbronchoscopy should be performed routinely in order to evaluate the respiratory tract, and if a lesion is discovered, bronchoscopic biopsy is mandatory for
histological diagnosis.

Electron microscopic examination is needed to disclose its smooth muscle origin. As in this case, immunohistochemical examination for actins of smooth muscle make it possible to differentiate leiomyomas from other spindle cell tumors including fibromas, neurofibromas, and neurilemmomas (Yellin et al. 1984).

Leiomyoma grows in a fashion of broad based polypoid mass, and typical bronchial leiomyoma extends to relatively distal locations. Histologically, lung parenchymal leiomyoma is very similar to uterine leiomyoma, and Steiner named it “metastasizing fibroleiomyoma of the uterus” (Steiner 1939), and due to this argument, a complete examination of the uterus is necessary to rule out primary myoma of the uterus. We thoroughly examined the patient to find any possible leiomyoma elsewhere after a diagnosis of leiomyoma was confirmed. However, she had no evidence of other systemic disease or any organic disease referable to the uterus. Once the diagnosis is confirmed, the feasibility of tumor resection through bronchoscopy should be considered, and if not, the resection of the tumor mass can usually be done through thoracotomy or by localized resections. However, extended resection is occasionally performed in cases of chronic inflammation of the lung and in cases of distal bronchietasis caused as a complication of leiomyomas.

Pulmonary leiomyomas were surgically treated by lobectomy in 51%, pneumonectomy in 14%, and segmental resection in 21% in one series (White et al. 1988), and the prognosis after surgical resection was excellent even in the cases of segmental resections. No tumor recurrence has been reported in the literatures. Recently the employment of videothoracoscope in the field of thoracic surgery has been tremendous. The advantages of thoracoscopic pulmonary resection is that a large skin incision and muscle splitting of the chest wall which causes postoperative pain can be avoided, and the recovery period may be shortened so that patients can return to previous physical activity earlier (Leslie et al. 1991). In this case, a preoperative impression of the benign nature of the tumor allowed us to perform videothoracoscopic right upper lobectomy with excellent results.

Three skin incisions were made: one 6 cm long thoracotomy incision just enough to remove collapsed upper lobe including the tumor mass, and two 1.5 cm long incisions for insertion of thoracoscope surgical instruments. The patient had only minimal postoperative pain, and was discharged on the fourth postoperative day in good condition. Her short hospitalization and early return to work demonstrates the cost effectiveness of the videothorascopic procedures.

REFERENCES


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