Pulmonary sequestration: A single-institutional series composed of 27 cases

Suat Gezer, MD,* İrfan Taştepe, MD, Mehmet Sırmalı, MD,† Göktürk Fındık, MD,± Hasan Türüt, MD,§ Sadi Kaya, MD, Nurettin Karaoğlanoğlu, MD, and Güven Çetin, MD¶

Drs Taştepe and Gezer (*left to right*)

Objective: Large series about pulmonary sequestration from a single institute are rare in the literature. In this study, we aimed to evaluate diagnosis, treatment, and outcomes of pulmonary sequestration in a single institute.

Methods: Records of patients with pulmonary sequestration between January 1982 and January 2006 were reviewed retrospectively. Age, sex, symptoms, diagnostic procedures, operative findings, operative techniques, postoperative complications, and follow-up results were evaluated.

Results: Twenty-seven patients, 17 male and 10 female, with an average age of 23.3 were operated on for pulmonary sequestration. Twenty patients had preoperative symptoms including recurrent pneumonia attacks, chest pain, hemoptysis, and shortness of breath. Chest radiography, thoracic computed tomography, aortography, magnetic resonance imaging, and bronchoscopy were used as diagnostic methods. Of the cases, 19 (70%) were intralobar pulmonary sequestration and 8 (30%) were extralobar pulmonary sequestration. Surgical procedures were lower lobectomy in 18 and segmentectomy in 1 of the patients with intralobar pulmonary sequestration and simple mass excision in all of those with extralobar pulmonary sequestration. Postoperative histopathologic examinations excluded any other alternative diagnosis. Furthermore, it detected an aspergilloma ball in 1 of the intralobar pulmonary sequestration specimens. Two patients had a postoperative complication (prolonged air leak in 1 patient and empyema in the other). During the follow-up period (mean 2.3 years), none of the patients presented a problem. No mortality was encountered.

Conclusion: Owing to the potentially severe complications they can cause, pulmonary sequestrations should be removed whenever they are diagnosed. Since careful dissection provides sufficient surgical comfort, preoperative identification of the aberrant vessels is not a rule for the success of the operation.

From the Atatürk Chest Diseases and Thoracic Surgery Training and Research Hospital, Clinic of Thoracic Surgery, Ankara, Turkey.

Received for publication June 25, 2006; revisions received Oct 2, 2006; accepted for publication Nov 2, 2006.

Address for reprints: Suat Gezer, MD, Ulubatlı mah. 6. sk. Betül apt. No: 8 Şanlıurfa, Turkey (E-mail: Suatdr@hotmail.com).

*Current affiliation: Şanlıurfa State Hospital, Clinic of Thoracic Surgery, Şanlıurfa, Turkey.

†Current affiliation: Medical Faculty of Süleyman Demirel University, Clinic of Thoracic Surgery, Isparta, Turkey.

±Current affiliation: Erzurum Numune Hospital, Clinic of Thoracic Surgery, Erzurum, Turkey.

§Current affiliation: Medical Faculty of Kahramanmaraş Sütçü İmam University, Clinic of Thoracic Surgery, Kahramanmaraş, Turkey.

¶Current affiliation: Bayındır Hospital, Clinic of Thoracic Surgery, Ankara, Turkey.

J Thorac Cardiovasc Surg 2007;133:955-9

0022-5223/$32.00

doi:10.1016/j.jtcvs.2006.11.003

Pulmonary sequestration (PS) indicates a portion of lung tissue that does not have a normal connection with the tracheobronchial tree and has an abnormal vascular supply. Aberrant blood supply to the lung was first reported by Huber in 1777, but the term "sequestration" was introduced by Price in 1946.[1] This rare abnormality has an incidence between 0.15% and 6.45% among all pulmonary malformations.[2]

PSs are divided into two subgroups: intralobar pulmonary sequestration (ILS) and extralobar pulmonary sequestration (ELS). Whereas ILS is contained within normal lung parenchyma, ELS is separated from normal lung and has its own visceral pleura.[2] Almost always, arterial supply to the PS is from a systemic artery and venous drainage is to pulmonary veins in ILS and to a systemic vein in ELS.[3]

There are numerous case reports about PS in the English literature, but large series reported from a single hospital are rare.[1] In this study, we aimed to evaluate

Abbreviations and Acronyms
CT = computed tomography
ELS = extralobar pulmonary sequestration
ILS = intralobar pulmonary sequestration
PS = pulmonary sequestration
VATS = video-assisted thoracoscopic surgery

the presentation and outcomes of PS, with diagnostic and treatment modalities, in a series consisting of 27 patients at a single hospital.

Patients and Methods

Records of patients with PS in Atatürk Chest Diseases and Thoracic Surgery Training and Research Hospital between January 1982 and January 2006 were reviewed retrospectively. Age, sex, symptoms, diagnostic procedures, operative findings, operative techniques, associated anomalies, postoperative complications, and follow-up results were evaluated.

Results

Twenty-seven patients had been operated on for PS in the thoracic surgery clinic. Of these patients, 17 (63%) were male and 10 (37%) were female. Average age of the patients was 23.3 years, ranging between 3.5 and 51 years. Six (22%) patients were in the pediatric age range (younger than 16 years old) and 21 (78%) patients were adults (older than 16 years).

Twenty (74%) patients had had symptoms preoperatively: recurrent episodes of pneumonia in 10 patients, chest pain in 6 patients, hemoptysis in 2 patients, and shortness of breath in 2 patients (Table 1).

All of the patients had chest x-ray films, which showed a cystic or solid mass in 19 patients, parenchymal infiltration in 4 patients, and no pathologic sign in 4 patients. All the patients but 5, treated in the early years, when thoracic computed tomography (CT) was not available, had undergone contrast-enhanced thoracic CT, which showed cystic or solid masses (Figure 1). Three patients had undergone aortography, which revealed the aberrant arterial supply, due to the suspicion of PS (Figure 2). Only 1 patient had been evaluated with magnetic resonance imaging, which displayed a mass (Figure 1). All of the patients had also

TABLE 1. Symptoms versus pathologic condition and age group

	ILS		ELS	
Symptoms	Pediatric age	Adult	Pediatric age	Adult
Recurrent episodes of pneumonia	2	6	1	1
Chest pain	1	3		2
Hemoptysis		2		
Shortness of breath		1		1

ILS, Intralobar pulmonary sequestration; *ELS,* extralobar pulmonary sequestration.

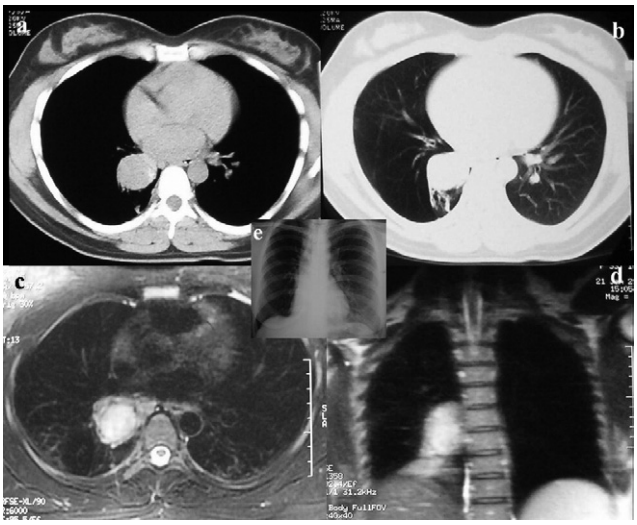

Figure 1. a and b, A 33-year-old ILS patient's thoracic CT scans. The ILS lesion presented as a solid mass in the lower lobe of the right lung near the heart. c and d, MRI appearance of the same lesion. e, Chest x-ray film. *ILS,* intralobar pulmonary sequestration; *CI,* computed tomography; *MRI,* magnetic resonance image.

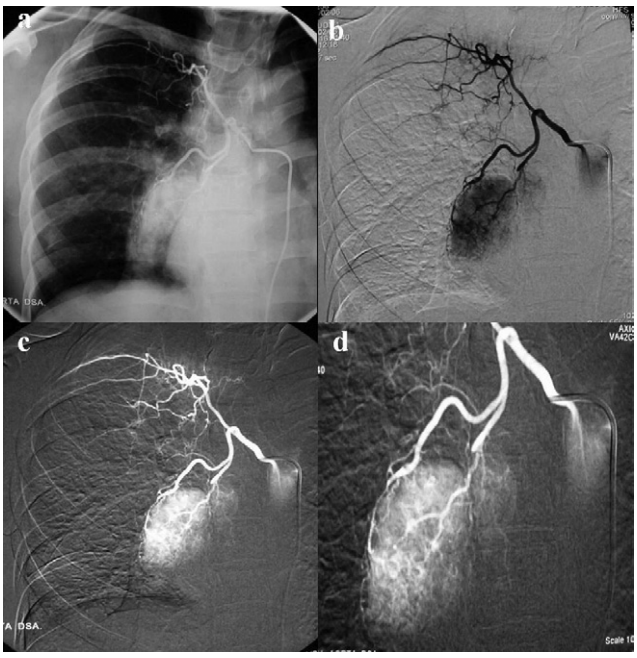

Figure 2. a, b, c, and d, Angiograms of same patient showing the aberrant artery of ILS coming from the bronchial artery.