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Large Sclerosing Hemangioma of Lung (Pneumocytoma): A Case Report and Review of the Literature

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Abstract. Sclerosing hemangioma of the lung is a rare lung tumor with a well-recognized benign behaviour. This report of a 46-years-old Saudi female, known case of bronchial asthma was presented to the pulmonary clinic in our hospital complaining of cough for six months associated with mild hemoptysis and wheeze. Pathological examination of the resected tumor revealed a well-circumscribed mass measuring 10x6.5x6 cm. Histologically and immunohistochemically, the tumor was a classic SHL. Up to our knowledge this is the largest SHL in the literature. The literature on this topic was reviewed.

Keywords: Sclerosing pneumocytoma, Hemangioma

Introduction

Sclerosing hemangiomas (SH) are rare benign primary pulmonary tumors. The term 'sclerosing hemangioma' was introduced by Liebow and Hubbell in 1956[1]. Based on many immunohistochemical and ultrastructural studies, sclerosing hemangioma of the lung (SHL) is most probably derived from primitive undifferentiated respiratory epithelial cell[1-6]. Clinically, SHL presents most frequently in females as an incidental, asymptomatic, solitary peripheral coin lesion detected by chest radiography[7]. The tumors ranged in size from 0.3 to 8 cm[2,4]. In

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this report, a large tumor that measures 10 cm in maximum diameter was studied. Up to our knowledge this is the largest SHL in the literature.

Case History

A 46-years-old Saudi woman known case of bronchial asthma was presented to pulmonary clinic at King Faisal Specialist Hospital & Research Centre, Jeddah, Saudi Arabia (KFSH&RC-Jeddah) complaining of cough for six months associated with mild hemoptysis and wheeze. The cough increased by upper respiratory tract infection and perfumes. No fever, shortness of breath or chest pain was reported, plus she was considered a non-smoker. No history of loss of weight or decrease in appetite was reported. Her vital signs were as follows; heart rate 92 beat/min, respiratory rate 18 breath/min, blood pressure 136/75 mmgh, and O_2 saturation was 99%. Examination of the chest revealed inspiratory wheeze, and decreased breath sound in the right middle lobe. Examination of the heart revealed a pansystolic murmur at mitral area radiating to axilla. The rest of the examination was normal. The chest X-ray revealed a large homogenous mass in middle right lobe; no obvious pleural effusion or pneumothorax was seen (Fig. 1a). The left lung field was clear with a normal sized heart. Computerized topography (CT) scan with contrast showed a large heterogeneous mass with a central cystic component in the right middle and lower lung zones with intra-bronchial extension and compressive collapse of the adjacent segment of middle lobe (Fig. 1b). There was an adjacent mild pleural thickening and a mild pleural effusion; however, there was no lymphadenopathy. Needle aspiration biopsy was taken for evaluation. Bronchoscopy demonstrated endoluminal vascular lesion almost obstructing the right bronchus intermedius. Bronchoalveolar revealed few atypical cells. Biopsy results were inconclusive and revealed atypical cells with acute and chronic inflammation associated with fibroblast proliferation. The patient was operated and a right posterolateral thoracotomy was performed. During surgery, there was a large mass in the right middle lobe extending into the right upper and lower lobes. The mass had intraluminal component, and obstructing the right main bronchus and right upper branch. Right pneumonectomy was done. Gross pathological examination revealed a well-circumscribed mass measuring 10 x 6.5 x 6 cm and located 3 cm away from the bronchial margin (Fig. 2). The cut surface revealed a gray discoloration with focal areas of

hemorrhage. Microscopic evaluation (Fig. 3a-d) revealed a tumor that

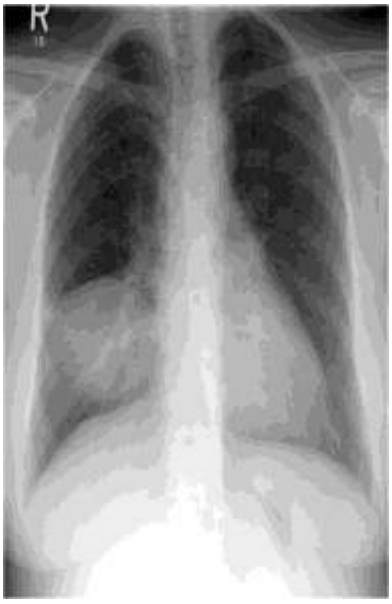

Fig. 1a. Chest X-ray revealed a large homogenous mass in middle right lobe. There is no obvious pleural effusion or pneumothorax.

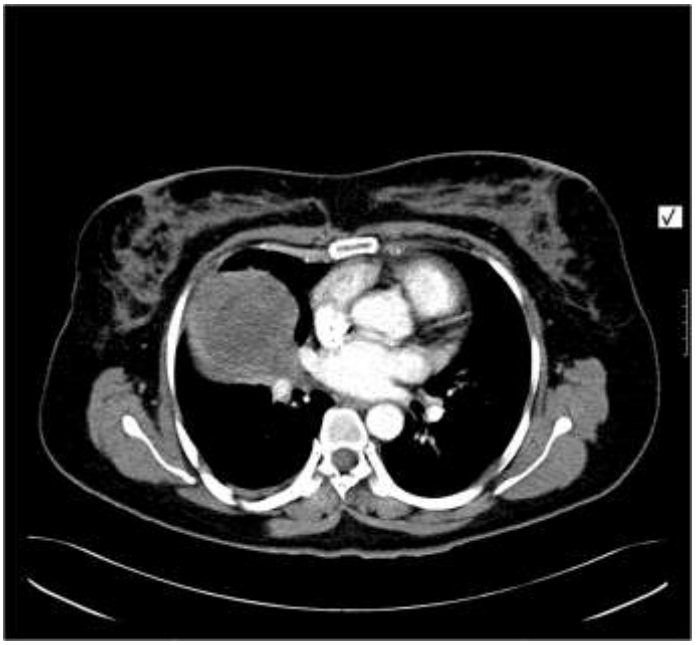

Fig. 1b. CT scan with contrast showed large heterogeneous mass in right middle and lower lung zones with compressive collapse of the adjacent segment of the lobe.

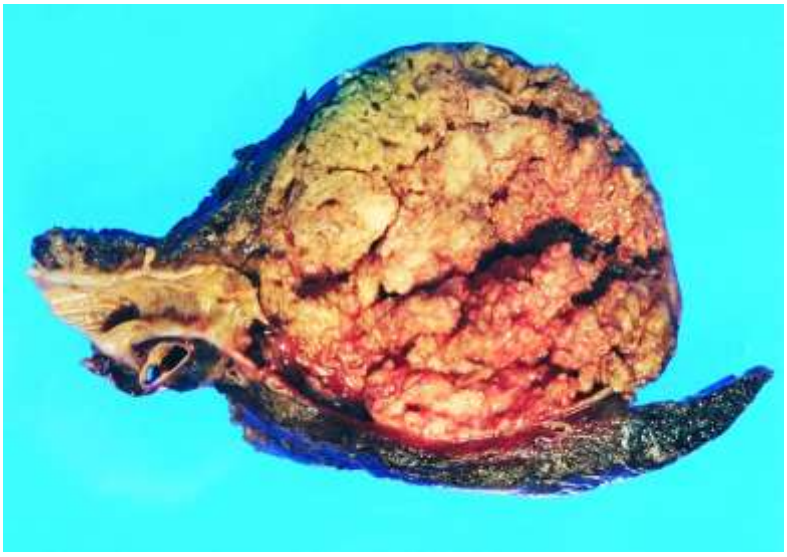

Fig. 2. **Cut section of the tumor showing a well circumscribed large mass with a gray discoloration. Focal areas of hemorrhage are seen in the center of the specimen. The tumor involves, protrudes and obstructs the bronchus. A compressed lung tissue is seen at the lower part of the figure.**

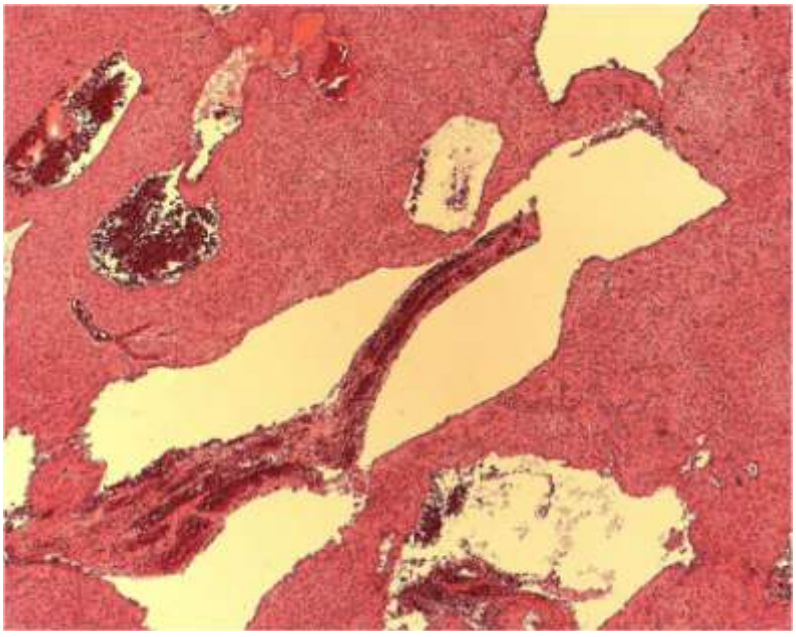

Fig. 3a. **Section shows a hemorrhagic pattern of the tumor composed of ecstatic spaces, some of which are filled with blood and surrounded by pneumocytes (H & E, x 100).**

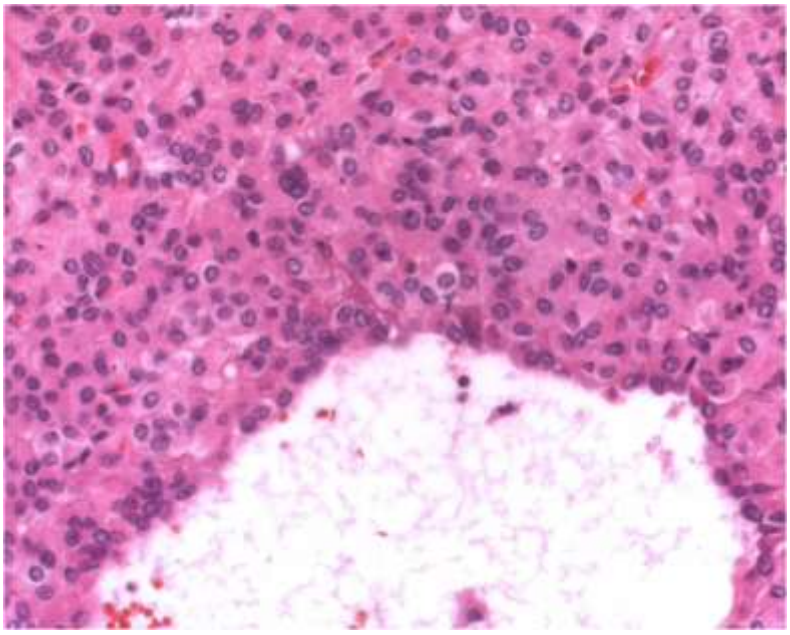

Fig. 3b. Higher power section revealed solid pattern composed of epitheloid stromal cells with abundant eosinophilic cytoplasm (H & E, x 100).

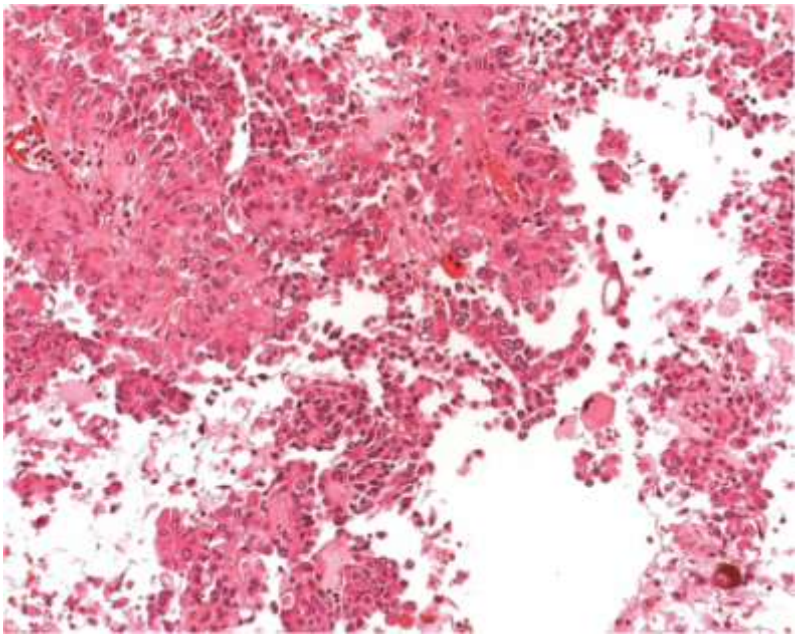

Fig. 3c. Sections show papillary pattern which identified in focal area of the tumor (H & E, x 200).

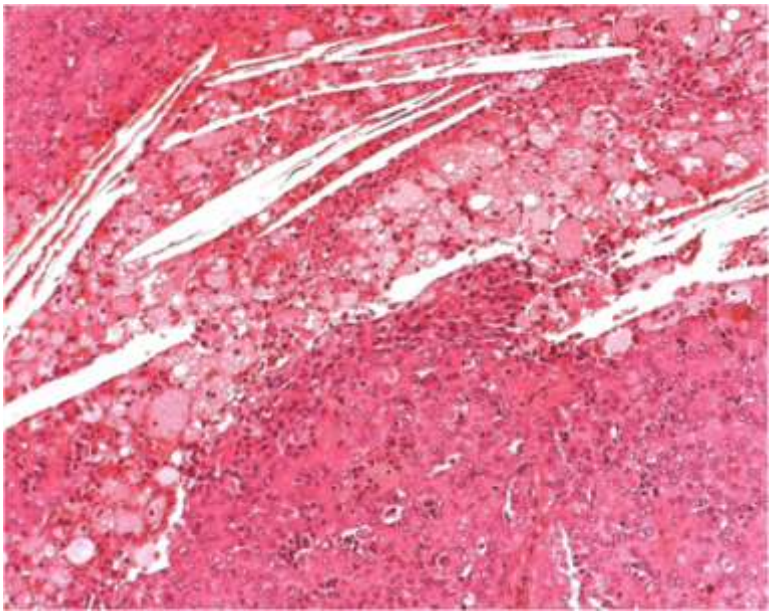

Fig. 3d. Section shows aggregate of foamy histiocytes associated with cholesterol clefts indicating an area of previous hemorrhage (H & E, x 200).

Table 1. Summary of the immunohistochemistry results.

Antibody	Surface lining cells	Stromal cells
AE1/AE3	+	-
Cytokeratin 7	+	-
Cytokeratin 20	-	-
Cytokeratin 5/6	-	-
EMA	+	+
CEA	+	-
Chromogranin A	-	-
Synaptophysin	-	-
NSE	Focal +	Focal +
TTF-1	+	+
Vimentin	+	+
CD34	-	-

EMA: Epithelial membrane antigen
NSE: Neuron specific enolase
TTF-1: Thyroid transcription factor
CEA: Carcinoembryonic antigen

is composed predominantly of solid sheets with many hemorrhagic areas and focal papillary pattern. The tumor cells which are the stromal cells are epitheloid bland polygonal cells with abundant eosinophilic cytoplasm and indistinct cell borders. The lining surface epithelial cells consist mainly of one layer and composed of bland-looking cuboidal cells. There was hemorrhage, focal aggregates of histiocytes and cholesterol clefts indicating previous areas of hemorrhage. No mitotic figures could be identified. There was no angiolymphatic invasion or necrosis. The result of the immunohistochemistry study was summarized in Table 1 (Fig. 3e-f). Cytokeratin stains including AE1/AE3 and Cytokeratin 7 were positive only in the lining surface cells. The stromal cells are negative for both cytokeratins. Epithelial membrane antigen (EMA) was positive in both types of cells with a strong diffuse pattern in the surface lining cells and focal pattern in the stromal cells. Focal staining for neuron specific enolase (NSE) was seen in both cellular types; however the other neuroendocrine markers including chromogranin A (CgA) and synaptophysin were negative in both types of cells. Thyroid transcription factor (TTF-1) stain was strongly positive in both cellular types. Carcinoembryonic antigen (CEA) was negative.

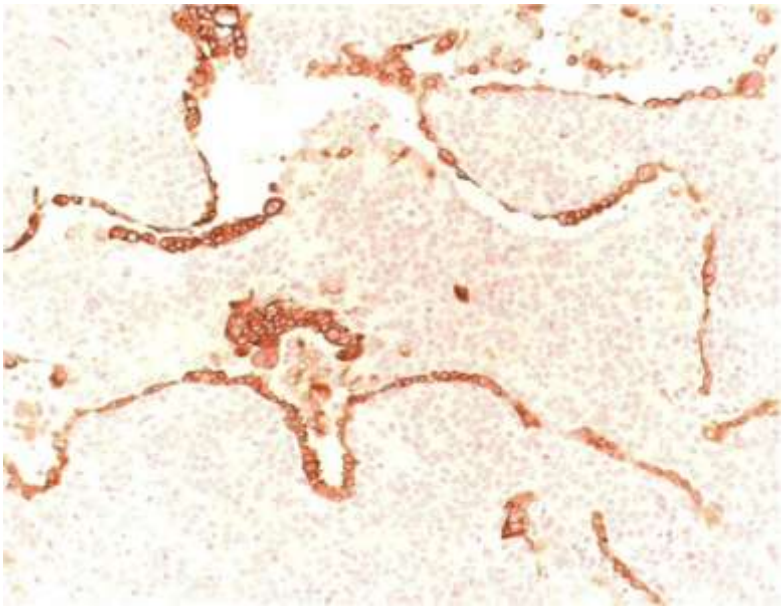

Fig. 3e. Immunohistochemistry stain for CK7 shows positive staining of the surface cells but negative staining in the stromal cells.

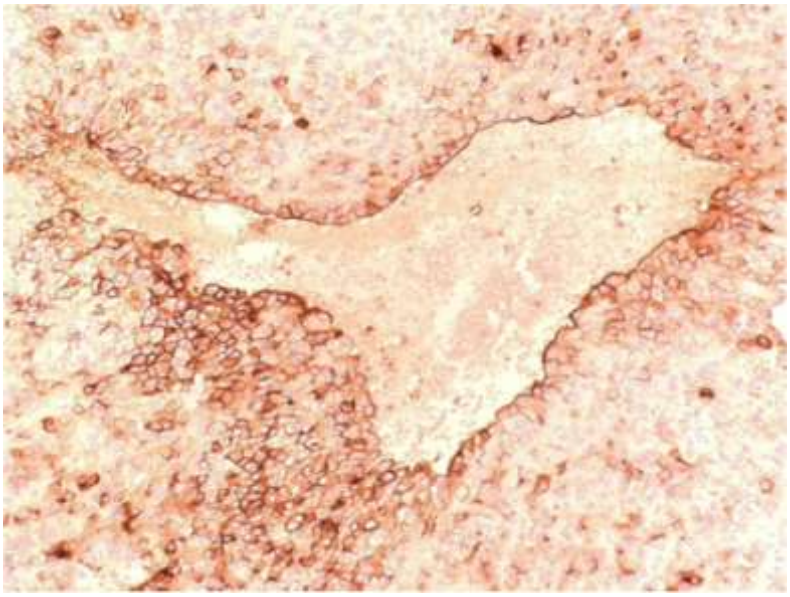

Fig. 3f. Immunohistochemistry stain for EMA shows positive staining of the surface cells and focal staining of the stromal cells.

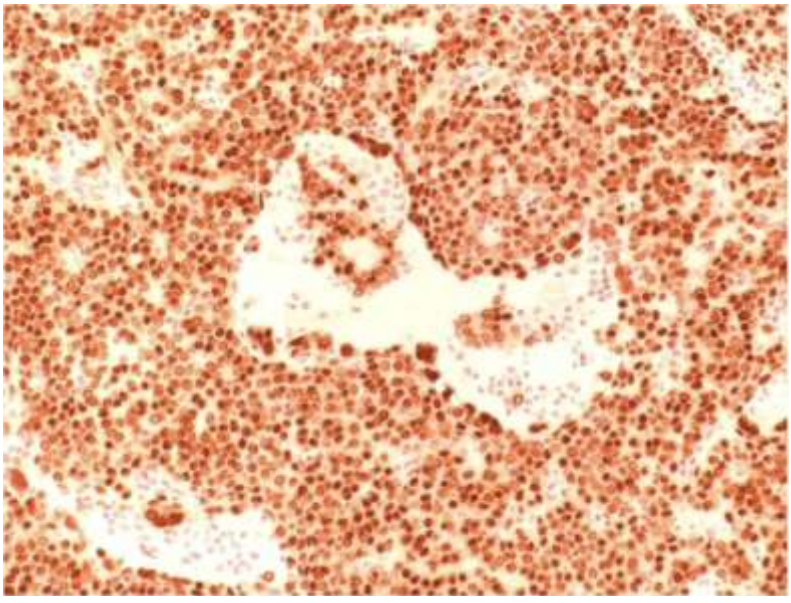

Fig. 3g. Immunohistochemistry stain for TTF-1 shows positive staining in both the surface cells and the stromal cells.

Based on this classic morphological and immunohistochemical profile, a diagnosis of sclerosing hemangioma was made. The main pathological differential diagnosis in this case was carcinoid tumor which was excluded based on the above histological and immunohistochemical profile. The patient was admitted to the intensive care unit post operatively in a stable condition for one day. She was transferred to the ward, and then she was discharged after four days on omeprazole 20 mg at bed time for one month and furosemide 20 mg once daily for one week in addition to pain medications. The last visit was on the 10th June 2010, which is 2 years after diagnosis and the patient was stable with no complains.

Discussion

SHL is a rare benign and distinct clinicopathologic entity. Pathologically, SHL is not uncommonly misdiagnosed as other types of benign or malignant lung neoplasm. Katzenstein *et al*.[7] reported in their series that the referring pathologists provided a correct diagnosis in only half of the cases. They were misdiagnosed as a malignant diagnosis such as carcinoid tumors, lung carcinoma, mesothelioma, blastoma and metastatic carcinoma. There are four histological variants of SHL including solid, papillary, sclerotic, and hemorrhagic[7]. These tumors tend to be solid tumor, however the presence of a cystic component has been described[4,5] and tumor that are exclusively cystic has also been reported[6]. The actual tumor cells are characteristically round cells within the stroma in all these patterns, whereas the surface cells lining the papillary projections or cystic spaces are normal or are hyperplastic bronchioloalveolar cells[8]. The tumor cells are epithelioid cells with abundant lightly eosinophilic or clear cytoplasm and bland nuclear features. Most cases can be diagnosed from characteristic architectural and cytological features. Immunohistochemical findings are helpful for confirming the diagnosis. In SHL, the tumor solid stromal cells express a different immunoprofile compared with the surface lining cells: the tumor cells are EMA+ CK– TTF-1+ while the surface cells are EMA+ CK+ TTF-1+[4,9,10]. This immunoprofile helps in differentiation from bronchogenic adenocarcinoma in which the tumor cells in both, the solid areas and the surface of the papillae share similar immunoprofile (EMA+ CK+ TTF-1+). Xu *et al*.[8] examined 32 cases of SHL by immunohistochemistry and found that the stromal cells were positive for

neuroendocrine markers, namely, chromogranin A (86%), NSE (100%) and synaptophysin (60%). In addition, some tumor cells were positive for EMA (100%), CEA (25%), and vimentin (100%). All tumor cells were negative for polyclonal anti-keratin antibody. However, in contrast to the stromal cells, the surface cells stained positively for keratin (100%), EMA (100%), and CEA (100%). Both surfactant and TTF-1 have been shown to be of value in supporting a primary pulmonary origin for neoplasms[11,12], although TTF-1 is more sensitive and specific[11,13]. This immunohistochemical profile will help to differentiate this tumor from the main differential diagnosis, which is carcinoid tumor. The differential diagnosis may also include clear cell (sugar) tumor. However, unlike SHL, clear cell tumors are composed of a single population of neoplastic cells immunoreactive for HMB-45 and CD34[14]. In the largest series of SHL in the literature, Devouassoux-Shisheboran *et al.*[4] reviewed a total of 100 cases at the Armed Forces Institute of Pathology, and reported that tumors ranged in size from 0.3 to 7 cm (mean, 2.6 cm) and the majority (73.7%) measured less than 3 cm. They reported that 96% were solitary and unilateral. As per our knowledge, our case is the largest SHL in the literature. Although huge in size, there was no evidence of any malignant microscopic features or aggressive behavior.

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الورم المصلب الوعائي الدموي للرئة
تقرير حالة ومراجعة لحالات مشابهة

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جدة – المملكة العربية السعودية

المستخلص. الورم المصلب الوعائي الدموي في الرئة، هو ورم نادر جدًا من أورام الرئة، وغير معروف السبب. يتألف الورم من اثنين من أنواع الخلايا الرئيسة: السطحية والخلايا الداخلية. على الرغم من أنه نادر ولكنه معترف به كورم حميد في الرئة. نقرر هنا حالة الورم المصلب الوعائي الدموي في الرئة كما عرضت، ككتلة عقدية اكتشفت في الصدر، خلال فحص الأشعة السينية لامرأة تبلغ ٤٦ سنة من العمر. تم استخدام الصبغات المناعية لدعم التشخيص. وهذا هو أكبر ورم مصلب وعائي دموي في الرئة وجد حتى الآن حسب المنشورات الطبية باللغة الإنجليزية بعد مراجعة الدراسات السابقة المتعلقة بهذا النوع من الأورام.