CASE REPORTS

DOEGE-POTTER SYNDROME BY PLEURAL SOLITARY FIBROUS TUMOR

Ana Sofia Alves[1*], Natalie Antunes[1], Joana Santos[2], João Eurico Reis[3], Paulo Calvinho[3]

[1] Radiology Department, Centro Hospitalar e Universitário de Lisboa Central, Lisbon, Portugal
[2] Pathology Department, Centro Hospitalar e Universitário de Lisboa Central, Lisbon, Portugal
[3] Cardiothoracic Surgery Department, Centro Hospitalar e Universitário de Lisboa Central, Lisbon, Portugal

* Corresponding author: sofiafalves92@gmail.com

Abstract

Introduction: *Solitary fibrous tumor of the pleura (SFTP) is a rare neoplasm that accounts for less than 5% of all pleural tumors.*

We present the case of a 73-year-old man with a history of recurrent episodes of severe hypoglycemia secondary to a large malignant SFTP. This paraneoplastic manifestation of SFTP occurs in less than 5% of cases and is referred to as Doege-Potter syndrome. Although rare, this is an important and reversible cause of hypoglycemia, which is resolved by complete surgical resection of the tumor.

We describe the pathogenesis, diagnosis, and treatment of Doege-Potter syndrome. Key imaging findings and pathologic correlation are shown.

Keywords: *Solitary Fibrous Tumor, Pleura, Hypoglycemia, Doege-Potter syndrome*

INTRODUCTION

Solitary fibrous tumor of the pleura (SFTP) is a rare neoplasm that accounts for less than 5% of all pleural tumors1. It arises from the mesenchymal cells of the submesothelial layer of the pleura. Although the majority of SFTPs have benign histologic features, 10-20% are malignant.

Up to 50% of SFTPs are asymptomatic and incidentally found. However, larger tumors may induce dyspnea, chest pain, cough, and weight loss[2,3]. Uncommonly, patients come to clinical attention because of severe and recurrent hypoglycemia. This paraneoplastic manifestation of SFTP occurs in less than 5% of casesand is referred to as Doege-Potter syndrome (DPS)[4]. There are about 100 cases reported in the literature.

CASE DESCRIPTION

A 73 year-old man was admitted to the emergency department with a 2-week history of recurrent episodes of symptomatic hypoglycemia (25–45 mg/dl). He also reported dry cough, asthenia, and an 8-kg weight loss in the past month.

The patient was not diabetic and did not take glucose-lowering drugs. There was no history of smoking or asbestos exposure. He had undergone a radical prostatectomy due to prostate cancer ten years before, without evidence of recurrence in the follow-up.

On physical examination, there were decreased breath sounds in the inferior half of the left hemithorax. His blood work was unremarkable, apart from low serum glucose levels (32 mg/dL). Endocrinologic tests revealed low levels of serum insulin and C-peptide suggesting hypoinsulinemic hypoglycemia.

Chest radiography (Figure 1) showed a large mass obscuring more than half of the left hemithorax and hemidiaphragm. The subsequent contrast-enhanced chest computed tomography (CT) (Figure 1) revealed a large, well-circumscribed and lobulated, pleural-based mass in the left hemithorax, measuring 16,8x17,7x9,7 cm (LxAPxT). It displayed heterogeneous contrast enhancement and compressed the adjacent lung, without radiologic evidence

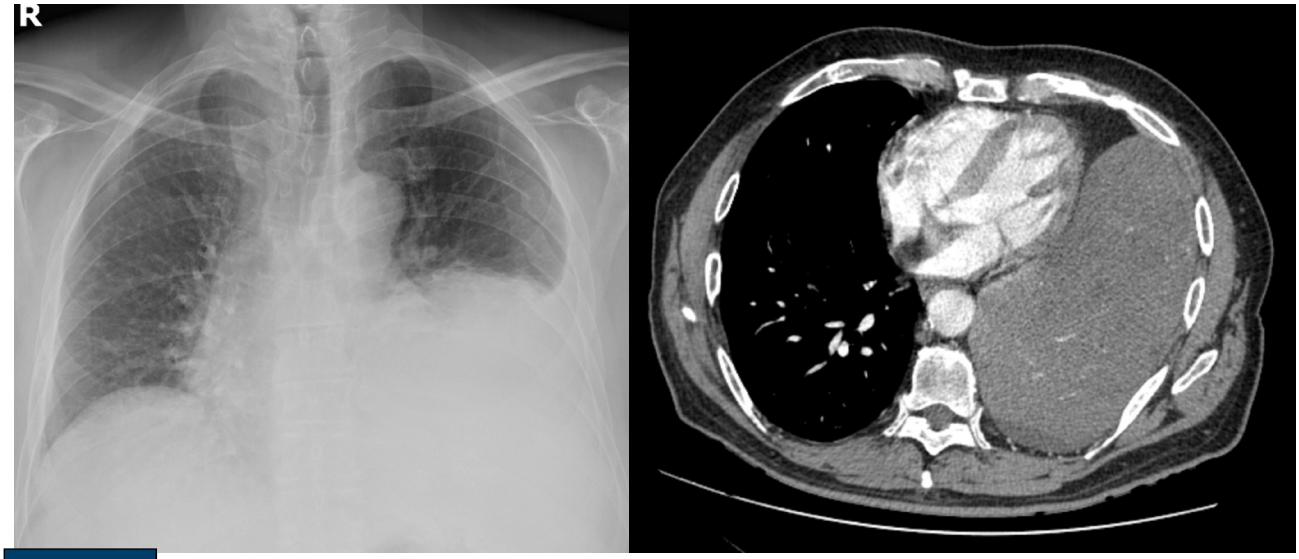

Figure 1 *Imaging studies.A- Chest radiography showing a large mass in the left hemithorax obscuring the left hemithorax and hemidiaphragm. B,C,D-contrast-enhanced chest CT demonstrating a large and heterogeneous pleural-based mass in the left hemithorax, with a left pleural effusion and left hemidiaphragm displaced inferiorly.*

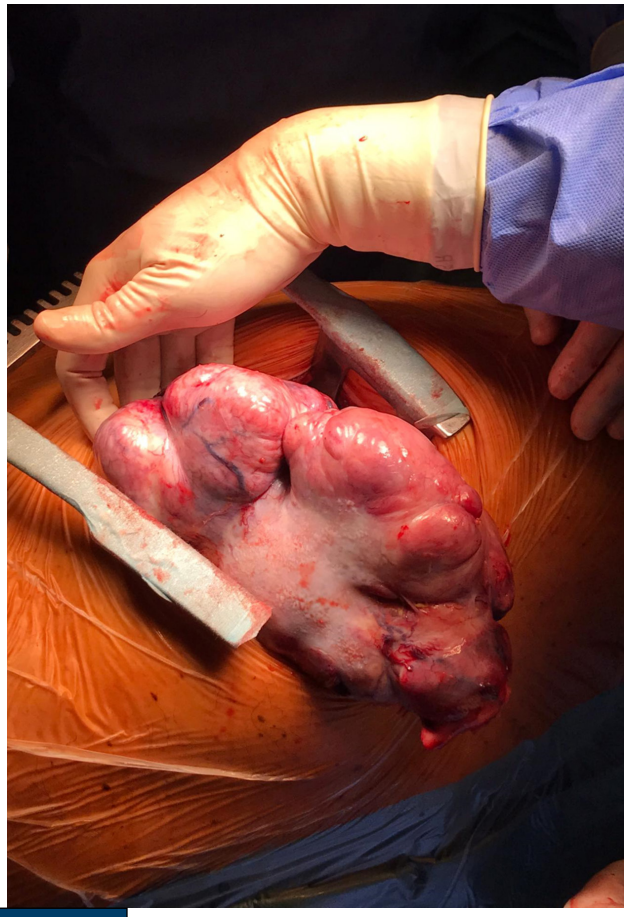

Figure 2 *Surgical specimen. A large and lobulated mass being excised during left thoracotomy*

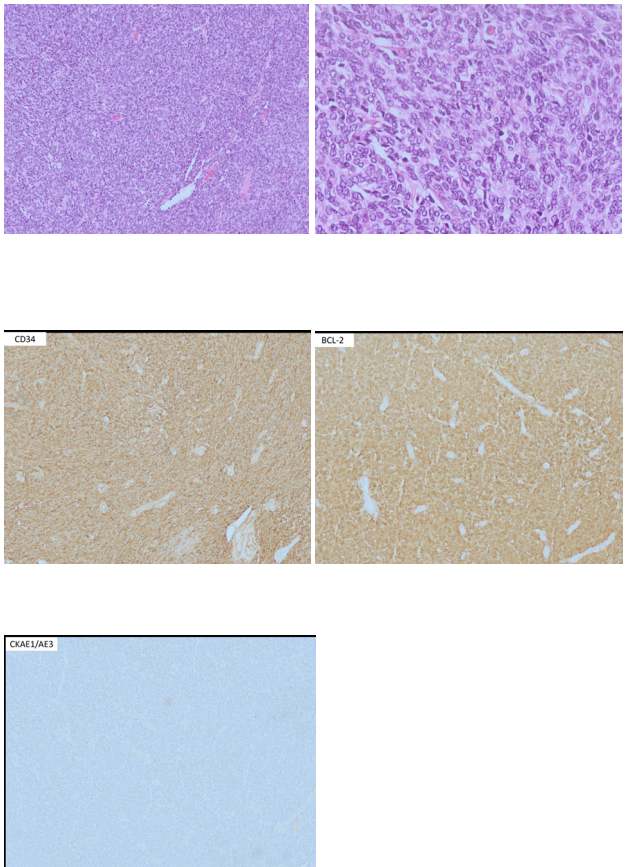

Figure 3 *Morphologic and immunophenotypic features of malignant solitary fibrous tumor of the pleura. A- H&E, 100X; B- H&E, 400X. C,D,E- The tumor cells stained positive for CD34 and BCL-2 and negative for CKAE1/AE3.*

of chest wall or mediastinal invasion. An associated ipsilateral pleural effusion was present. A contrast-enhanced CT of the abdomen and pelvis was negative for metastatic disease.

A CT-guided transthoracic biopsy was performed, and the histopathological examination was suggestive of a SFTP.

A left thoracotomy was performed for the complete excision of the tumor (Figure 2). Macroscopically,it was an encapsulated white mass that measured 17x20,5x12 cm (LxAPxT) and weighed 1684 g.

Microscopic examination revealed interlacing fascicles of spindle cells interspersed with thick bundles of collagen. The tumor cells stained positive for CD34 and BCL-2 and were negative for CK AE1/AE3 (Figure 3). There were areas of hypercellularity with high mitotic rate (10 mitoses per 10 high-power fields) and focal areas of necrosis. According to these features the tumor was classified as malignant, with tumor-free margins.

The surgical resection led to a complete resolution of the symptoms and laboratory data returned to normal. The patient was discharged on the fifth postoperative day.

Currently, he is asymptomatic on regular follow-up, at 6 months post-operation with no evidence of recurrence on CT.

DISCUSSION

Hypoglycemia accompanying SFTP is specifically referred to as DPS and is thought to result from tumor secretion of an abnormal form of the Insulin-like Growth Factor 2 (IGF-2) that is capable of activating insulin receptors, thereby inhibiting hepatic gluconeogenesis and increasing glucose uptake, resulting in hypoglycemia[5]. Also, serum levels of insulin and C-peptide are low, excluding other endogenous and exogenous causes of hypoglycemia. This paraneoplastic manifestation is more common with malignant SFTP with diameters of≥ 10 cm[4].

Chest radiograph is usually the initial diagnostic test for SFTP. On chest CT, SFTP typically appears as a well-circumscribed soft tissue mass in contact with the pleural surface, with homogeneous enhancement, although areas of necrosis or hemorrhage may be apparent, particularly in large tumors[1]. The differential diagnosis includes pleural metastases, mesothelioma, and synovial sarcoma[6].

Percutaneous CT-guided biopsy can underestimate the degree of malignancy due to the limited sampling, making complete resection necessary.

Malignant SFTP is diagnosed if one or more of the following features are present: size >10 cm, high mitotic rate (≥ 4 mitoses/10 high-power fields), hypercellularity, nuclear pleomorphism, and tumor necrosis or hemorrhage[3,7].

Immunohistochemistry is useful to differentiate SFTs from mesotheliomas and intrapleural sarcomas, as SFTs generally show reactivity for CD34 and BCL-2but not for epithelial markers such as low molecular weight cytokeratins[1,2,7].

Complete surgical resection of the tumor is the treatment of choice, usually resolving the hypoglycemia[4,5]. The role of adjuvant radiotherapy and chemotherapy remains unclear. The most important prognostic factor is complete excision with microscopically free margins[1]. Long-term follow-up is recommended because of the risk of local recurrence and metastatic disease[6]. The local recurrence rate of SFTP following surgery for benign SFTP is 2% up to 8%, but varies widely for malignant SFTP with a range of 14% for pedunculated tumors and up to 63% for sessile tumors, even with complete resection. If local recurrence is detected, surgical re-excision remains the preferred treatment if technically feasible[7].

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