Unexpected pulmonary tumour in a young woman

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CLINICAL QUESTION
A 21-year-old woman presented with an upper left lobe mass, discovered in a context of asthenia, dyspnoea, wheezing, flushes and evening fever. Initial CT imaging revealed a heterogeneous mass predominantly endobronchial into the bronchus of the lingula with latero-aortic and perihilar adenopathies. Positron emission tomography-CT scan found a hypermetabolism of the tumour (maximum standard uptake value (SUVmax=10) as well as in mediastinal lymph nodes (SUV=2.2). Initial fibroscopy performed found a stenosing endoluminal tumour. Left superior lobectomy and mediastinal lymph node dissection were performed.

Review the high quality, interactive digital Aperio slide at http://virtualacp.com/JCPCases/jclinpah-2018-205259/ and consider your diagnosis.

Q1: WHAT IS YOUR DIAGNOSIS?
Hematoxylin eosin safron (HES) slide 1:
A. Carcinoid tumour
B. Pulmonary myxoid sarcoma
C. Inflammatory myofibroblastic tumour
D. Myxoid liposarcoma
E. Pulmonary haematoma

Q2: WHAT ADDITIONAL ANALYSE(S) DO YOU PERFORM?
A. EWSR1 fluorescence in situ hybridisation (FISH)
B. ALK immunohistochemistry
C. Synaptophysin immunohistochemistry
D. Molecular analysis for lung carcinoma (EGFR, ALK, ROS1)
E. Nothing else

The correct answers are after the discussion.

DISCUSSION
Pulmonary myxoid sarcoma (PMS) is a very rare low-grade tumour, with only about 15 cases described in the literature.1 2 According to available data, this disease has not a male or female predominance, with an age range of 28–68 years. The clinical presentation is usually various; the symptoms may be cough, chest pain, haemoptysis or asymptomatic and could be accidentally discovered. Here, the macroscopic examination of the left superior lobe found a proximal tumour of 7×6×4 cm, well defined, growing in the upper lobar bronchus, following the bronchial tree with minimal areas of pulmonary infiltration. Microscopically tumorous cells appeared monomorphic, fusiform, not atypical and dispersed in a myxoid substancce. There were very few mitoses and no necrosis. The lymph node contained a follicular lymphoid hyperplasia without tumour localisation. Tumorous cells were negative for epithelial membrane antigen (E29, Dako), actin (1A4, Dako), desmin (D33, Dako) and CD34 (Qbend-10, Dako) but 80% of tumour cells were positive for epithelial membrane antigen (E29, Dako). A FISH was performed on formalin-fixed paraffin-embedded tumour tissues and found a translocation of EWSR1, which was confirmed by the next-generation sequencing (NextSeq 550 System, illumina) and correspond to the fusion transcript EWSR1/ATF1. The genetic characteristic of PMS is often the (2;22) (q33; q12) translocation with the EWSR1-CREB1 fusion gene. EWSR1 is found in most chromosomals translocations of sarcomas, with nearly 16 types of partners indexed.3 EWSR1/ATF1 can be found rarely in this type of tumour. ATF1 encodes for a cyclic AMP protein responsive element which is constitutively product after the translocation with EWSR1.4 This fusion with the partenaire ATF1, however, is not specific for myxoid sarcoma, since it is also found in clear cell sarcoma and angiomatoid fibrous histiocytoma.5–7 The differential diagnosis is mainly pulmonary mesenchymal chondrosarcoma and other myxoid tumours, as myxoid liposarcoma.6 7

The immediate operative follow-up was simple, and the patient received no further treatment. At 6 months of surgery, the patient had no evidence of clinicroadiological recurrence. The risk of relapse is low; however, there is a metastatic potential with few described cases of secondary cerebral, renal and pulmonary localisations.

ANSWERS
Q1 Pulmonary myxoid sarcoma; Q2 EWSR1 fluorescence in situ hybridisation (FISH).

Take home messages
- Mesenchymal tumours of the lung are very rare; the most frequent is pulmonary hamartoma, a benign tumour.
- Pulmonary myxoid sarcoma (PMS) is a low-grade tumour, often localised partially endobronchial and exceptionally metastatic.
- The diagnosis of PMS is morphological and confirmed by the presence of EWSR1 translocation.
Virtual case of the month

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REFERENCES
1 Jeon YK, Moon KC, Park SH, et al. Primary pulmonary myxoid sarcomas with EWSR1-CREB1 translocation might originate from primitive peribronchial mesenchymal cells undergoing (myo)fibrillar differentiation. *Virchows Arch* 2014;465:453–61.

2 Thway K, Nicholson AG, Wallace WA, et al. Endobronchial pulmonary angiomatoid fibrous histiocytoma: two cases with EWSR1-CREB1 and EWSR1-ATF1 fusions. *Am J Surg Pathol* 2012;36:883–8.

3 Romeo S, Dei Tos AP. Soft tissue tumors associated with EWSR1 translocation. *Virchows Arch* 2010;456:219–34.

4 Brown AD, Lopez-Terrada D, Denny C, et al. Promoters containing ATF-binding sites are de-regulated in cells that express the EWS/ATF1 oncogene. *Oncogene* 1995;10:1749–56.

5 Thway K, Fisher C. Tumors with EWSR1-CREB1 and EWSR1-ATF1 fusions: the current status. *Am J Surg Pathol* 2012;36:1–11.

6 Zhou Q, Lu G, Liu A, et al. Extraskeletal myxoid chondrosarcoma in the lung: asymptomatic lung mass with severe anemia. *Diagn Pathol* 2012;7:112.

7 Goetz SP, Robinson RA, Landas SK. Extraskeletal myxoid chondrosarcoma of the pleura. Report of a case clinically simulating mesothelioma. *Am J Clin Pathol* 1992;97:498–502.