

**Medical Image of The Week: Urothelial Carcinoma with Pulmonary Metastases
Presenting with Shoulder Pain**



Figure 1. AP view of the left shoulder demonstrated multiple pulmonary nodules.

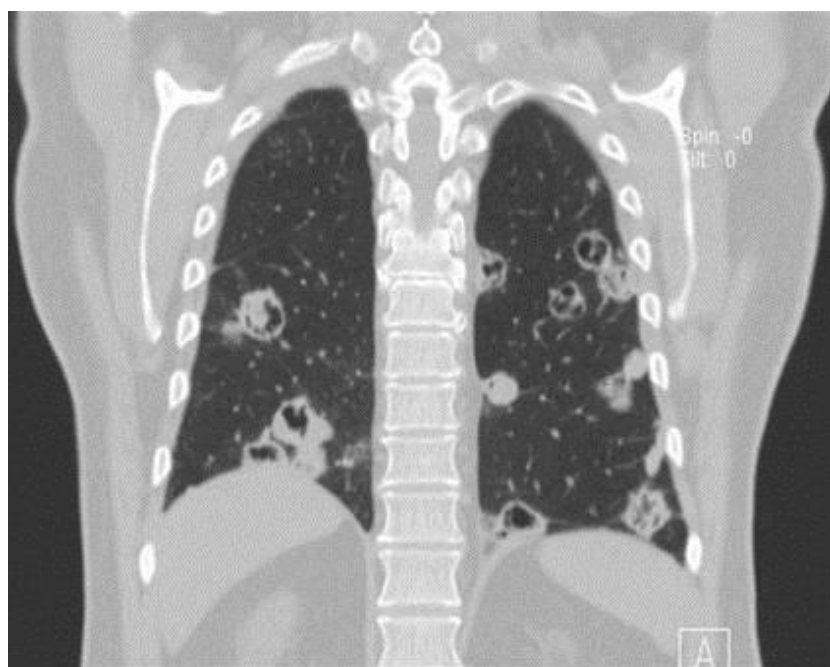


Figure 2. Coronal view of chest CT demonstrating innumerable pulmonary nodules with thick walled cavitations.



Figure 3. Axial view of chest CT demonstrating innumerable pulmonary nodules with thick walled cavitations.

A 68 year old man with a past medical history significant only for mild hyperlipidemia and distant cigar smoking presented to this primary physician's office with a chief complaint of left sided shoulder pain for more than 6 months duration. His only other complaint was a hacking morning cough that was attributed to GERD after resolution with omeprazole therapy. He was without any other complaints such as weight loss, fevers, chills, night sweats, shortness of breath, or dyspnea on exertion. His physical exam was without any abnormality. An initial radiograph of the right shoulder was obtained which was without any obvious bony abnormality but demonstrated numerous potential pulmonary nodules (Figure 1). He was then referred to pulmonology for further assessment. A chest CT scan performed with contrast again demonstrated numerous pulmonary nodules with thick walled central cavitations throughout the lung parenchyma bilaterally (Figures 2 & 3). Additional testing performed included Coccidioides serologies, c-ANCA, p-ANCA, Quantiferon Gold, PSA, and rheumatoid arthritis serology (RF/CCP) all of which were negative. He was taken for a CT guided lung biopsy of one of the nodules and the biopsy result demonstrated a poorly-differentiated carcinoma with focal squamous differentiation; nuclear "salt and pepper" features; along with immunostaining consistent with poorly differentiated urothelial cell carcinoma. The patient was referred to oncology but refused potential palliative chemotherapy.

The differential diagnoses for cystic and cavitary lung disease is very broad, therefore it is of utmost importance to differentiate between cystic and cavitary diseases. Typically, cystic lung diseases are round parenchymal lucencies with a thin wall, typically <2mm in thickness, whereas cavitary lung disease are round lucencies typically with a wall >4mm in thickness, but overlap between cystic and cavitary lung disease does exist

(1,2). Without evidence or symptomology to suggest malignancy, initial differential diagnosis must include infectious causes of cystic/cavitating lung disease. In regions such as the Southwestern United States where diseases such as Coccidioidomycosis is endemic, this must be included in the differential diagnosis, as does other potential infectious cystic/cavitating lung disease such as *M. tuberculosis*, *Pneumocystis* infection, or *Klebsiella* infection (2). Granulomatosis with polyangiitis (Wegener's granulomatosis), as well as other rheumatologic conditions must also be included in the initial differential diagnosis. In this case, infectious and rheumatologic testing was negative. Biopsy was then necessary to determine etiology which was consistent with a metastatic urothelial carcinoma. A CT urogram was performed which was without evidence of primary tumor. Literature review suggests that approximately 65% of metastatic urothelial cancers metastasize to the lung, and often form nodules with central necrosing cavitations (3).

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