Not all Centrilobular Nodules are in the Airways:
A case of intravascular birefringent polarizable material

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A 25-year-old male with a history of orthotropic liver transplant at age 17 for biliary atresia was admitted with chronic abdominal pain, nausea, and vomiting. During his hospitalization, he developed sporadic and recurrent fevers associated with hypoxemic respiratory failure and rapidly resolving septic shock further complicated by acute respiratory distress syndrome (ARDS) and recurrent *Streptococcus mitis* and *Streptococcus oralis* bacteremia. He did not have hemoptysis or relevant environmental exposures. The differential diagnosis was still broad at the time, including mycobacteriosis, fungal diseases, and less likely but possibly aspiration pneumonia, with CT scan demonstrating diffuse peripheral groundglass opacities and centrilobular nodules with mild interlobular septal thickening in the upper lobes (Figure A & B).

Despite treatment with appropriate antibiotics, he continued to have evanescent fevers. Other diagnoses such as malignancy, post-transplant lymphoproliferative disease and interstitial lung disease were then considered. Bronchoscopy with bronchoalveolar lavage was performed and was non-diagnostic. After a multidisciplinary discussion, he underwent video-assisted thoracoscopic surgery for lung biopsy. Histopathology staining revealed diffuse, intravascular, birefringent polarizable material associated with foreign body giant cell reaction (Figure C & D) consistent with illicit injection of crushed material through his peripherally-inserted central venous catheter. This case highlights the need for careful monitoring of patients with chronic pain disorders with readily available vascular access. Although centrilobular nodules on CT scans are most commonly seen in small airways disease, it is important to consider pulmonary vascular involvement as a differential diagnosis of centrilobular nodules.

References:


Sigdel, S, JT Gemind, and JFJ Tomashefski. The Movat pentachrome stain as a means of identifying microcrystalline cellulose among other particulates found in lung tissue. Arch Pathol Lab Med. 2011;135(2):249-254. 21284446

Figure A & B: (A) Axial view (B) Coronal MIP view. There are innumerable centrilobular nodules (black arrowheads) throughout both lungs. Note that the nodules respect the pleural surfaces and are regularly spaced, reflecting anatomy of the secondary pulmonary lobules and centrilobular structures. This is a rare case of centrilobular nodules which are vascular in origin and represent injected material deposited within centrilobular arterioles, and are associated with perivascular inflammation. Figure C VATS lung biopsy with H&E stain showing normal lung parenchyma with extensive foreign body cell reaction (Blue arrow). Figure D: VATS lung biopsy sample under polarized light revealing intravascular birefringent material associated with foreign body giant cell reaction to microcrystalline cellulose (Red arrow).