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CLINICAL VIGNETTE

Mesothelioma, Discovered Incidentally

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Case Presentation

A high-functioning 79-year-old male was noted to have new onset of elevated serum creatinine. PMHx includes, hypertension, hypercholesterolemia, and prostate cancer. Ultrasound of the kidneys revealed two enhancing right interpolar renal lesions and cystic pancreatic lesions felt to be side-branch type intramucinous pancreatic neoplasms for which magnetic resonance imaging was performed. Aside from the renal masses and cystic lesions in the pancreas, there was also an incompletely characterized left pleural lesion measuring 23 mm x 13 mm. Subsequent positron emission tomography (PET) and computed tomography (CT) scan demonstrated moderate uptake in the pleural lesion and mediastinal nodes but no clear uptake in the renal lesions. Pathologic examination of the pleural lesion via CT-guided biopsy revealed epithelioid mesothelioma. Exposures of note included brief tobacco use (1.75 pack years) in his early 20's and talc used on the feet during his time in the Army. The larger renal mass was biopsied, and pathology was not consistent with malignancy. He subsequently underwent left thoracotomy and parietal pleurectomy and decortication. Lymph node sampling did not reveal mesothelioma, although small lymphocytic lymphoma was synchronously identified for which no treatment was indicated. After radiotherapy to the left pleura, the patient has felt well aside from mild post-thoracotomy discomfort.

Discussion

An incidentaloma is an incidental finding that is diagnosed in an asymptomatic patient or symptomatic patient undergoing imaging for an unrelated reason.[1-5] Incidentalomas have greatly increased in recent years due increasing cross-sectional imaging and rapidly advancing image resolution. The radiologic studies with highest prevalence of detected incidentalomas include chest CT (45%), CT colonography (38%) and cardiac MRI (34%), MRI of spine (22%) and MRI of brain (22%).[5] While the identification of the mesothelioma in this patient was serendipitous, incidentalomas typically are a form of overdiagnosis, especially if the identified lesion is benign or an indolent tumor not likely to produce symptoms before the patient dies of another cause. Overdiagnosis can lead to more testing that is costly, anxiety provoking and unnecessarily exposes the patient to more radiation or invasive treatments or procedures that potentially result in harm.[1,2,4,5] Indeed, a pediatric neurosurgeon has coined the acronym VOMIT to denote this type of iatrogenesis. - "victims of modern imaging technologies."[3] Prior to ordering an imaging study, physicians should be reminded of the risk of discovering incidentalomas as potential risk of imaging along with radiation exposure, allergic reactions and nephropathy from contrast and inform their patients of such risks.

The clinical dilemma that is sometime created by the discovery of an incidentaloma is particularly relevant in the age of "defensive medicine". Although some guidelines exist with regard to management of the incidentaloma once identified, there are organs for which there are none (e.g., brain, breast, spine, colon, prostate and parotid), and many of them are directed at radiologists and not the ordering physician.[5] Given that incidentalomas by their very nature will be discovered by our colleagues in radiology, their opinion as to the importance of the finding will obviously help guide the subsequent clinical decision-making. The American College of Radiology Incidental Findings Committee has issued a number of white papers offering general guidance for the management of incidentally discovered masses, with the understanding that each individual's circumstances, the clinical environment, available resources, and the judgment of the practitioner will ultimately affect patient care.[1]

The goals of the ACR Incidental Findings Committee are to 1) reduce risks to patients from additional unnecessary examinations, including the risk of radiation and that associated with interventional procedures; 2) limit the costs of managing incidental findings to patients and the health care system; 3) achieve greater consistency in recognizing, reporting, and managing incidental findings, as a component of formal quality improvement efforts; 4) provide guidance to radiologists who are concerned about the risk for litigation for missing incidental findings that later prove to be clinically important; and 5) help focus research efforts to lead to an evidence based approach to incidental findings.[1]

Pulmonary incidentalomas are not uncommon with prevalence of 8-51% for incidental solitary pulmonary nodules in CT studies. Characteristics of the nodule itself suggesting need for further investigation include size greater than 6-8mm, irregular borders, eccentric calcifications or low density. Risk factors in the case presented included his more advanced age, prior albeit brief tobacco use, possible exposure to asbestos in talc powder and personal history of malignancy of the prostate. Any nodule greater than 6mm in size in a patient with risk factors deserves follow-up imaging (interval depending on level of risk) with

low threshold to proceed to positron emission tomography and biopsy.[6]

Mesothelioma is a neoplasm with long latency period, up to 40 years in some series. While most arise in the pleura, it can also occur in the peritoneum and the tunica vaginalis. The incidence has declined over the past decade due to the recognition of asbestos exposure as a primary etiology with consequent efforts to eliminate this exposure. Concomitant tobacco use likely increases risk, and some have suggested radiation therapy for other malignancies as potentially etiologic also. Carbon nanotubes and simian vacuolating virus 40 (SV40) may be carcinogenic in animals, but there is no definitive role in human mesothelioma.[7] The case patient was asymptomatic, but common signs and symptoms associated with mesothelioma are nonspecific and can be seen with any intrathoracic disease, whether benign or malignant. Cough and dyspnea are typical, while chest wall pain is seen as a more specific symptom. Pleural based nodularity and/or pleural effusions are commonly seen; only the former was present in the case patient. Paraneoplastic syndromes described in mesothelioma include hypercalcemia, hypoglycemia, autoimmune hemolytic anemia and hypercoagulable states, none of which were identified in this entirely asymptomatic patient.[8]

Diagnosis can be difficult, especially given that the disease is relatively uncommon and the amount of tissue obtained often minimal. Epithelioid histology, seen in the case patient, is most common and associated with best prognosis; sarcomatoid variants are associated with a worse prognosis. Pleural fluid examination is not very sensitive nor specific and CT-guided biopsy, which established diagnosis in this case, is limited by small sample size and potential risks of pneumothorax and tumor seeding with needle track. Video-assisted thoracoscopy is preferred, allowing for possible simultaneous pleurodesis. Staging depends on extension into abutting structures and lymph node involvement.[9]

Surgery can be considered in experienced centers in non-disseminated disease with epithelioid histology and in patients who are not disqualified by co-morbidity or inadequate cardiopulmonary function.[8] Extrapleural pneumonectomy (EPP) or pleurectomy/decortication (PD) will be at discretion of the surgeon, the latter approach obviously lung-sparing.[9] Trimodality therapy (surgery with chemotherapy and radiation) should be offered to patients with stage 2 or 3 disease.[8] Chemotherapy alone with pemetrexed and a platinum compound (cisplatin or carboplatin) with or without the antiangiogenic agent bevacizumab is recommended for patients who are not fit for surgery, have widely disseminated disease and/or show sarcomatoid histology.[9,11] Surgery followed by intensity-modulated radiotherapy (IMRT), a form of 3-dimensional treatment allowing for improved precision, was utilized in the case patient given favorable histology, T1N0 staging, lung sparing surgery and high rates of relapse in the ipsilateral hemothorax and case series suggesting a benefit of this combination approach. Targeted immunotherapies which have shown promise in non-small cell lung cancer remain under study for mesothelioma.[9]

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