Pictorial Quiz

A patient with gastroesophageal junction carcinoma and cough

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ABSTRACT

A 40-year-old, never smoker male with gastroesophageal junction carcinoma was evaluated for dyspnea and cough. Computed tomography scan was obtained which showed ground-glass opacities surrounded by rim of consolidation (Atoll sign). The patient underwent bronchoscopy with transbronchial lung biopsy and was diagnosed with organizing pneumonia secondary to checkpoint inhibitor toxicity.

KEY WORDS: Atoll sign, check point inhibitor toxicity, ground glass opacity

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A 40-year-old male never-smoker with gastroesophageal junction carcinoma was evaluated for fevers, dyspnea, and productive cough after recent treatment for community-acquired pneumonia. He had recently received pembrolizumab and radiation therapy to his spine (C4 – T1). Vital signs were normal, and laboratory tests were unremarkable except for chronic anemia related to prior chemotherapy. Computed tomography of the chest was performed [Figure 1] and based on the findings, bronchoscopy with bronchoalveolar lavage and transbronchial lung biopsies were performed.

QUESTION

Question 1: What is the computed tomography (CT) sign known as, and what is the diagnosis?

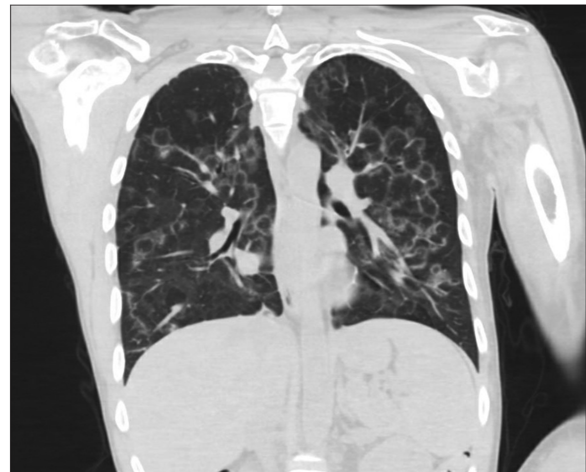

Figure 1: High-resolution computed tomography of the chest in coronal view demonstrating areas of ground-glass opacities surrounded by rim of consolidation

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ANSWER

Answer 1: The sign shown on the CT scan is known as the "Atoll" or the "Reverse Halo" sign.

The diagnosis is pembrolizumab-induced organizing pneumonia (OP), a form of checkpoint inhibitor pneumonitis (CIP).

This sign is classically seen in OP. The central area relates to alveolar septal inflammation and cellular debris in alveolar spaces while the ring-shaped peripheral consolidation corresponds to granulomatous tissue within distal airspaces.[1] This sign has relatively high specificity for OP but can also be seen in inflammatory, neoplastic, or infectious diseases. By integrating the patient's history and clinical findings, the differential diagnosis can be narrowed further and sometimes, a biopsy may not be needed. This is especially helpful in the immunocompromised host.[2]

In our case, pembrolizumab-induced OP (a form of CIP) was diagnosed through transbronchial biopsy. CIP is rare but may be severe and potentially fatal. It is a diagnosis of exclusion with multiple patterns of injury reported, including nonspecific ground-glass opacities, OP, interstitial patterns, and hypersensitivity pneumonitis.[3] Treatment depends on the severity of CIP, and drug discontinuation may be necessary as in our case. The prognosis is favorable because there is a good response to steroid therapy.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patients understand that his names and initials will not be published and due efforts will be made to conceal their identity.

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Conflicts of interest

There are no conflicts of interest.

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