

# EVALI Masquerading as Malignancy: A New Imaging Pattern

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## Introduction

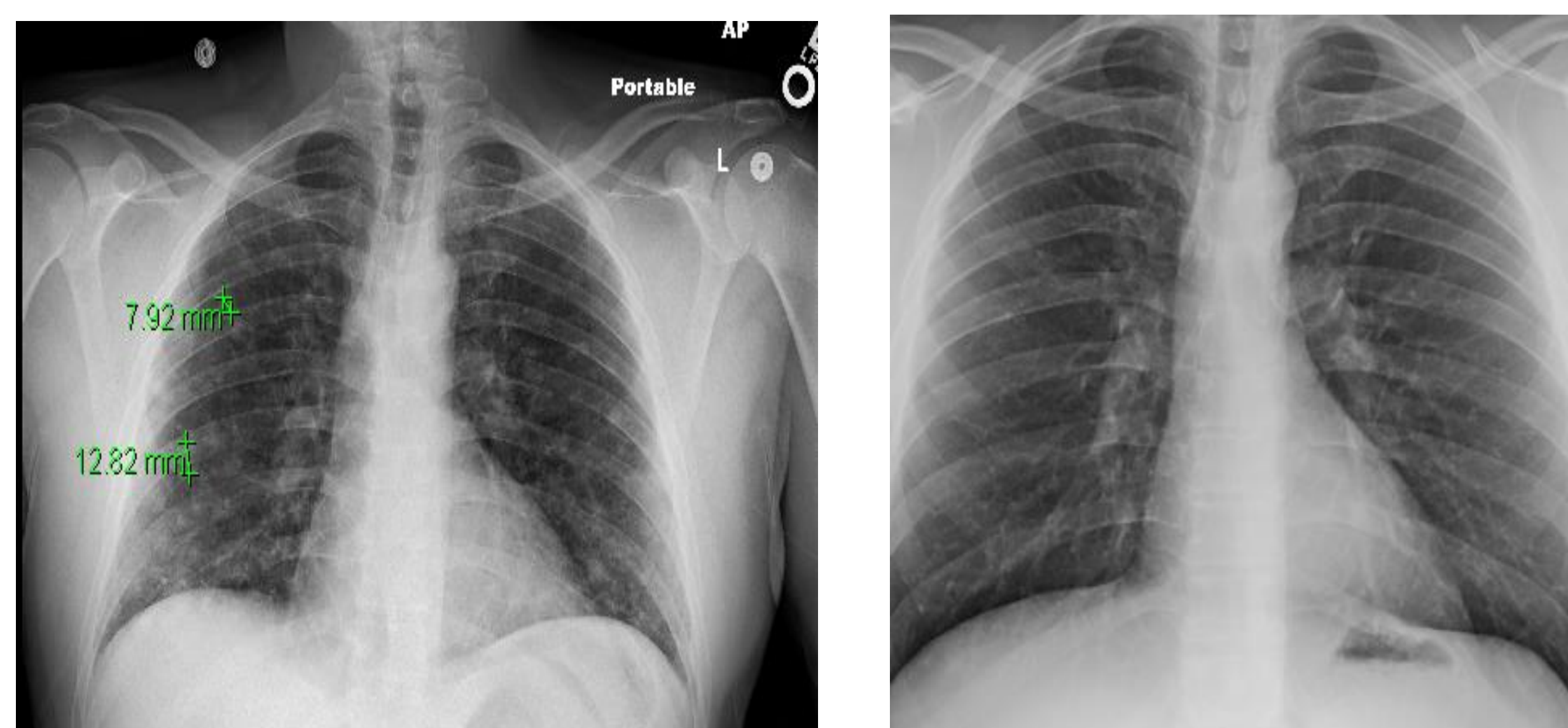
- E-cigarette or Vaping Use-Associated Lung Injury (EVALI) is a newly identified lung disease attributed to vaping.
- 2,807 cases, including 68 deaths, were documented as of mid-February 2020 per the CDC.
- 83% of the affected patients had a history of using tetrahydrocannabinol or cannabidiol products.
- Vitamin E acetate has been one of the implicated additives contributing to the development of this pathology.
- EVALI is a burgeoning epidemic which was curbed by COVID-19 but still needs to be addressed.

## Case Presentation

- 36-year-old male without significant medical history presented to the ED with high fever of 103°F, dry cough, pain on deep inspiration and malaise for 4 days.
- Social history included intermittent use of mango flavored tobacco vapes and marijuana vapes over the span of 8 months, last use were 3 and 4 weeks respectively, prior to presentation.
- Vitals and basic laboratory values were within normal limits however given concern for potential infection, cultures were obtained and broad spectrum antibiotics were started.
- CT-angiography chest showed innumerable, bilateral, randomly distributed pulmonary nodules of varying sizes, largest measuring 1.8cm, with mediastinal and hilar lymphadenopathy. Major differential diagnoses per radiology included metastatic disease from unknown primary, lymphoma or atypical infection, including fungal infection.
- Inflammatory and immunological serologies were found to be unremarkable. Hepatitis panel, Lyme, HIV, influenza, beta-D glucan and galactomannan were negative as were fungal and AFB cultures.
- Additional CT and ultrasound studies ruled out primary lesions and lymphadenopathy in the scrotum, abdomen and pelvis.
- CT-guided biopsy of the lung parenchyma and results showed lung parenchyma with hemorrhage, acute inflammation, and diffuse alveolar damage with fibroblastic proliferation, which is not an uncommon pathology for EVALI.
- Once fevers subsided, the patient was discharged without antibiotics.
- Repeat CT after 2 months demonstrated a dramatic improvement with fewer, smaller bilateral ground-glass pulmonary nodules.
- Upon follow-up in the pulmonary clinic, the patient was asymptomatic, having abstained from vaping for approximately 12 weeks.

## Learning Objectives

- Encourages physicians to consider EVALI as a potential differential diagnosis in patients with fevers and diffuse pulmonary nodules.



The image on the left was the initial chest x-ray, taken on 10/6/2019, showing multiple nodules of varying size. The chest x-ray on the right, taken on 11/6/2019, shows complete resolution.

## Common Imaging Findings

- Majority of patients (83%) presenting with suspected EVALI have CXR and CT chest findings of diffuse hazy or consolidative opacities, with basilar predilection.
- Common CT chest opacities are typically ground glass and sometimes spare the subpleural space.
- Pleural effusions are less common
- Range of radiographic patterns noted in EVALI:
  - Diffuse alveolar damage – Dependent consolidation with diffuse ground glass and air bronchograms
  - Acute eosinophilic pneumonia – Nodular consolidation, diffuse ground glass, septal thickening, and scant effusions
  - Hypersensitivity pneumonitis – Centrilobular and confluent ground glass opacities found anteriorly and independent areas respectively with lobules of mosaic attenuation
  - Organizing pneumonia – Areas of diffuse, multifocal and confluent
  - Lipoid pneumonia – Ground glass and consolidative opacities with areas of fat attenuation



The first 3 images are from the same CT scan on 10/4/2019. Beginning with the coronal CT plane, it shows multiple pulmonary nodules bilaterally of varying size. The next image is an axial CT plane again showing the nodules, more towards the base of the lungs. The penultimate image is another from the same scan. The final image, in the lower left corner, is from 12/6/2019, showing resolution of the nodules.

## Discussion

- Reports have documented EVALI-related hypersensitivity pneumonitis, acute eosinophilic pneumonia, organizing pneumonia, lipoid pneumonia and diffuse alveolar hemorrhage.
- Our case brings to light a new imaging pattern related to this illness.
- This case illustrates findings which could avert work-up related to malignancy and infection, thereby avoiding procedure-related complications and maintaining cost-consciousness.

## References

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