

A Breath of Trouble: Exploring Nitrofurantoin-Induced Interstitial Lung Injury Case Study

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Introduction

- Nitrofurantoin is used for UTI treatment and prophylaxis.
- Generally well-tolerated, it can cause pulmonary toxicity at any point, ranging from acute to chronic presentations
- Adverse effects can mimic other conditions, delaying diagnosis.
- Prompt recognition and discontinuation can reverse early symptoms.
- This case highlights subacute pulmonary dysfunction after prolonged nitrofurantoin use.

Case Report

Patient: 76-year-old female with PMH of Hypertension, hypothyroidism, recurrent UTIs with chronic bladder dysfunction.

Symptoms: Progressive dyspnea, dry cough, and hypoxemia for 4 months

Clinical Timeline:

- **1 Month Prior:** Hospitalized for presumed multifocal pneumonia
- **Post-Discharge:** Continued respiratory symptoms with persistent dry cough and worsening dyspnea
- **Current Admission:**
 - Progressive hypoxemia requiring high-flow nasal cannula
 - CT chest revealed peribronchial fibrosis, bronchiectasis, and worsening ground-glass opacities
 - No history of smoking, travel, bird or mold exposure, or pet ownership
 - Echocardiogram showed normal ejection fraction with mild-to-moderate mitral regurgitation

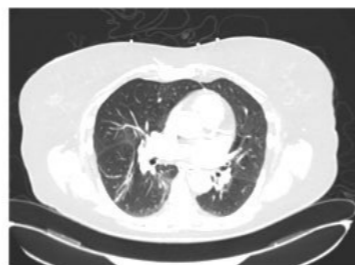
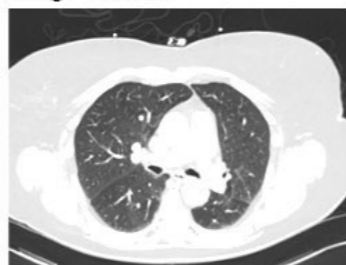
Key Finding: Nitrofurantoin used for 2 years as UTI suppression

Intervention & Outcome:

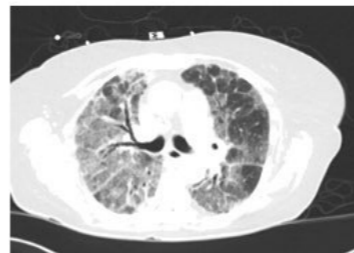
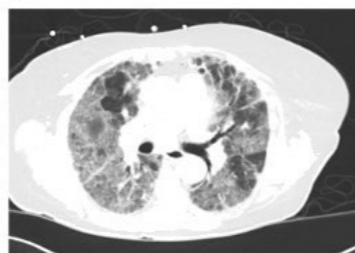
- Nitrofurantoin was discontinued
- Initiated on methylprednisolone (1 mg/kg) with a tapering course
- Oxygenation significantly improved
- Patient was discharged on low-flow oxygen therapy

Case Report

2 years ago in 2022



Last year 2024



Discussion

- Nitrofurantoin, although effective in managing UTIs, is a well-documented but underrecognized cause of drug-induced ILD, particularly with chronic suppressive use. Its pulmonary toxicity can manifest in acute, subacute, or chronic forms:
 - **Acute:** Days to weeks with fever, chills, dyspnea
 - **Subacute:** weeks to months with persistent dry cough, low-grade fever
 - **Chronic:** Months to years with chronic cough, and worsening hypoxia from fibrosis. May cause permanent lung damage if not recognized early
 - In this case, the patient's subacute to chronic course was initially misdiagnosed, resulting in continued nitrofurantoin exposure and disease progression.

- Risk factors: Female sex, elderly age, prolonged duration of use, pre-existing lung disease
- The mechanism of toxicity is unknown, though proposed causes include hypersensitivity reactions, oxidative damage, and immune-mediated injury.
- "Diagnosis is difficult due to vague symptoms and overlap with common conditions. Imaging may show ground-glass opacities or fibrosis, and PFTs often reveal a restrictive pattern with reduced DLCO
- Treatment includes:
 - Immediate drug discontinuation is the first step.
 - Corticosteroids (e.g., methylprednisolone)
 - Oxygen therapy may be required for significant hypoxemia.
- Delayed recognition can lead to permanent pulmonary fibrosis and prolonged oxygen dependence.

Conclusion

- Long-term nitrofurantoin use warrants vigilance for pulmonary side effects.
- Misdiagnosis (e.g., pneumonia) can lead to continued exposure and harm.
- Recommend:
 - Periodic symptom screening for respiratory issues
 - Pulmonary function tests for patients on long-term therapy
 - Prompt discontinuation upon suspicion of toxicity

References

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