

## INTRODUCTION

- Nocardia* species are aerobic, variably acid-fast, Gram-positive filamentous bacteria found in **soil**
- Cutaneous nocardiosis is rare and often mimics hidradenitis suppurativa (HS), acne conglobata, cellulitis, or sporotrichosis, leading to delayed diagnosis
- N. brasiliensis* most commonly causes **mycetoma**, defined by triad of **swelling, draining tracts, and bacterial granules**.
- Early **recognition and culture** are key to prevent dissemination and **morbidity**

## CASE DESCRIPTION

- 27-year-old **uninsured male construction worker**, immigrant from **Mexico**, with recurrent **draining nodules** on upper back previously labeled **HS and acne**.
- Multiple **ED visits** and **empiric antibiotics**, brief **isotretinoin** trial, over **7 years**
- Serial chest CTs** in 2025 reveal enlarging **1 cm LLL subpleural nodule** and bilateral **ground-glass opacities**
- Neck CT**: sinus tracts and soft-tissue infiltration.
- Labs**: WBC 22.7 × 10<sup>9</sup>/L, Hgb 10 g/dL, lactate 2.3 mmol/L.
- Histopathology**: suppurative granulomatous inflammation with **sulfur granules (GMS+)**
- Culture** grew *N. brasiliensis*
- Treated with IV **amikacin + imipenem** → oral **TMP-SMX + azithromycin**
- Marked improvement by **7 weeks**; 4-month CT showed **resolution of pulmonary nodules**
- No immunodeficiency** identified.

## DISCUSSION

### 1. Epidemiology & Pathogenesis:

- Nocardia brasiliensis* is a **soil-borne**, filamentous, variably acid-fast bacterium causing most **mycetoma in Mexico** and Latin America. Infection follows **minor trauma** or inoculation. Though often linked to immunosuppression, **up to 45%** occur in **healthy** hosts, typically laborers with **soil exposure**.

### 2. Clinical Presentation & Differential Diagnosis:

- Cutaneous nocardiosis mimics **HS, acne conglobata, and cellulitis**. Chronic **draining tracts** and yellow **granules** are classic. Our patient's HS-like back nodules underscore the challenge of delayed recognition due to the **clinical overlap between nocardiosis and chronic inflammatory skin disorders**
- Pulmonary involvement** by *N. brasiliensis* is extremely rare; concurrent cutaneous + pulmonary disease in an **immunocompetent host** is exceptionally rare

### 3. Diagnostic Work-up:

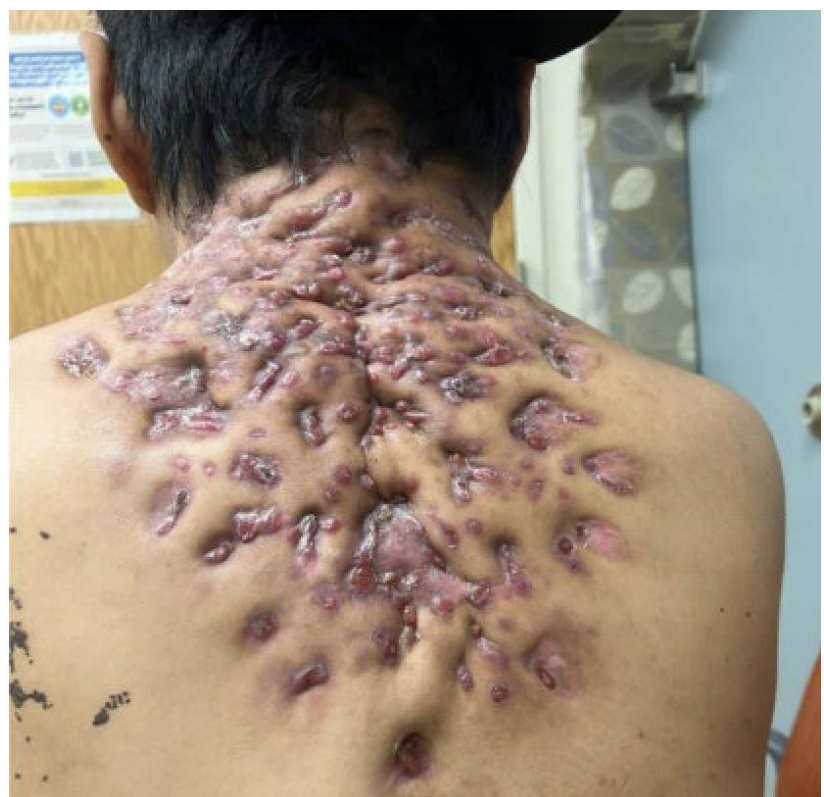
- Biopsy with **GMS/AFB stains plus culture** is diagnostic. Imaging (CT/MRI) helps detect **dissemination** to (lungs/central nervous system). *N. brasiliensis* growth confirmed both **cutaneous and pulmonary disease** in an immunocompetent patient.

### 4. Treatment & Clinical Course:

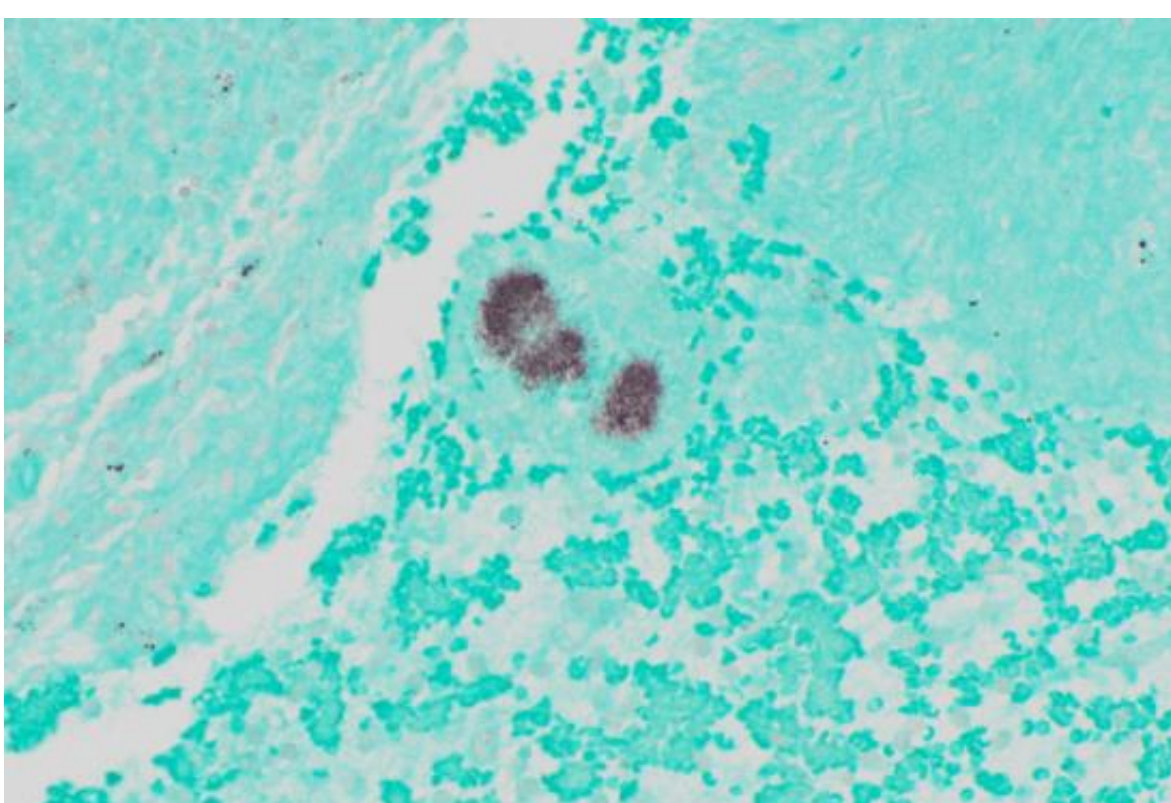
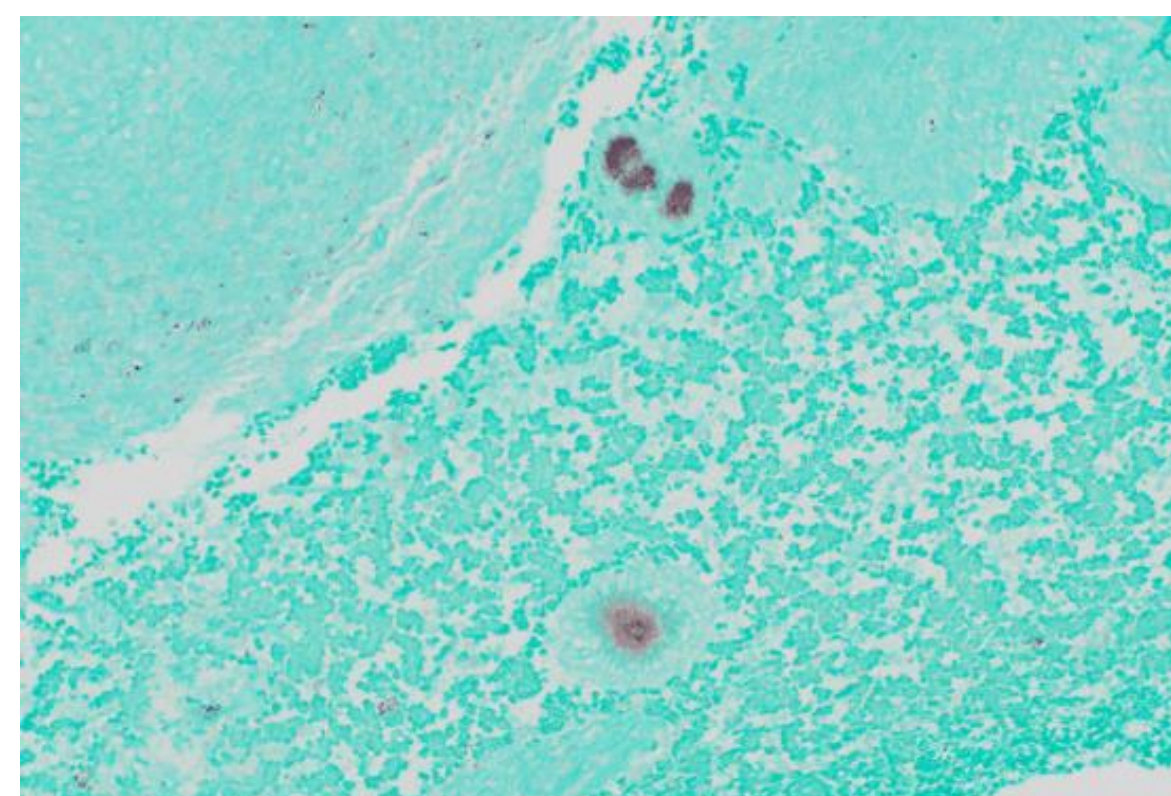
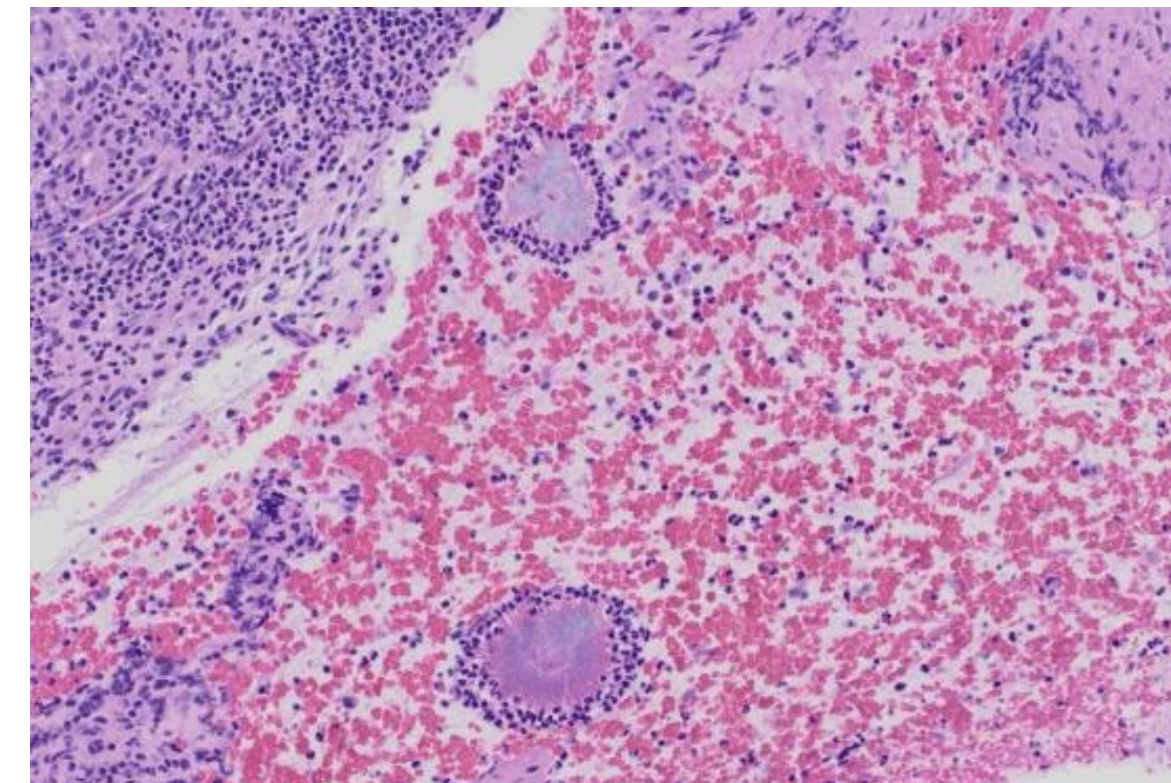
- First-line **TMP-SMX for 1–3 months** (longer if disseminated).
- Severe disease: **combination IV therapy** (typically amikacin ± imipenem) followed by transition to oral agents.

### 5. Clinical & Social Implications:

- Mortality varies 7–64%** depending on immune status and dissemination.
- Fragmented, ED-based care and lack of insurance** can delay evaluation of persistent skin infections. Diagnosis and follow-up can transform prolonged morbidity into curable infection.



Figures 1A-C: A. Adult male with cutaneous nocardiosis and delayed pulmonary dissemination five years prior to presentation at ED B. At presentation to ED C. After six weeks after diagnosis and initiation of targeted therapy



Figures 2A-C. A. Hematoxylin & Eosin stain at 20x magnification B. Grocott Methenamine Silver (GMS) special stain at 20x magnification C. GMS stain at 40x magnification

## LEARNING POINTS & CONCLUSION

- Evaluation of **treatment-resistant HS or acne** should include biopsy with **bacterial, fungal, and AFB stains** plus **culture or molecular identification**, especially in **immigrants from endemic regions/with soil contact**
- Mycetoma-type** nocardiosis can occur in **immunocompetent** hosts and may rarely **spread to lungs**
- Early, **prolonged**, targeted therapy prevents **morbidity and scarring**
- Social determinants of health such as **access barriers** and **fragmented care** may **delay diagnosis**.

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