

Diagnostic Challenges in Tattoo-Associated Atypical Mycobacterial Infections: The Role of Clinicopathologic Correlation

Presented by
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Disclosures

I do not have any relevant financial relationships to disclose.

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Case 1



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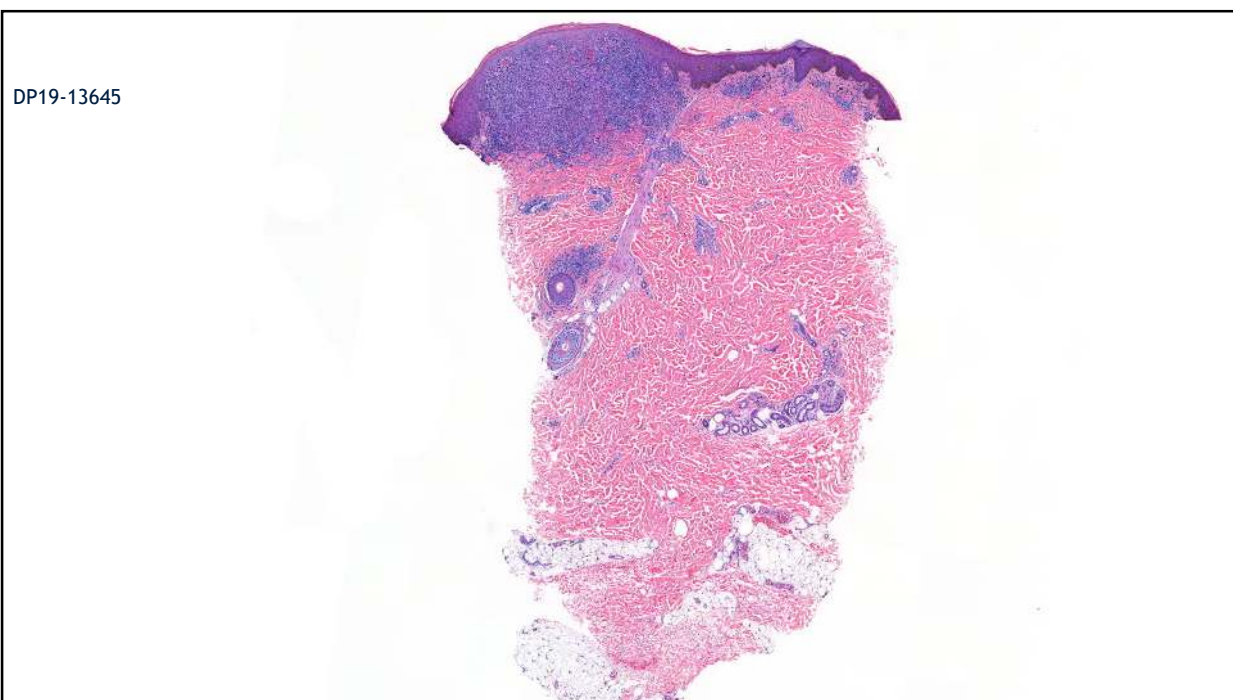
Case 1

HPI: A 20-year-old African-American male presented with a pruritic rash in his tattoo that has persisted for 1 month. The rash began shortly after he received his most recent tattoo on his right forearm. He has been getting tattoos since age 16 without prior reactions. Otherwise feels well.

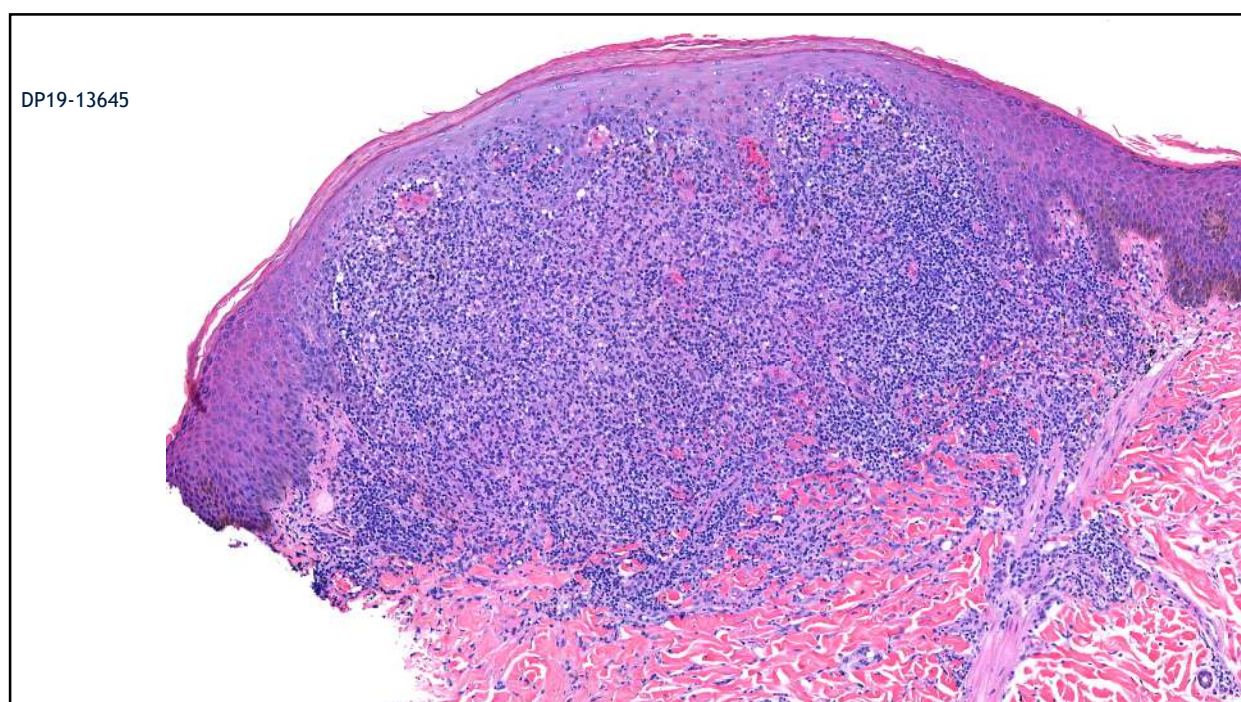
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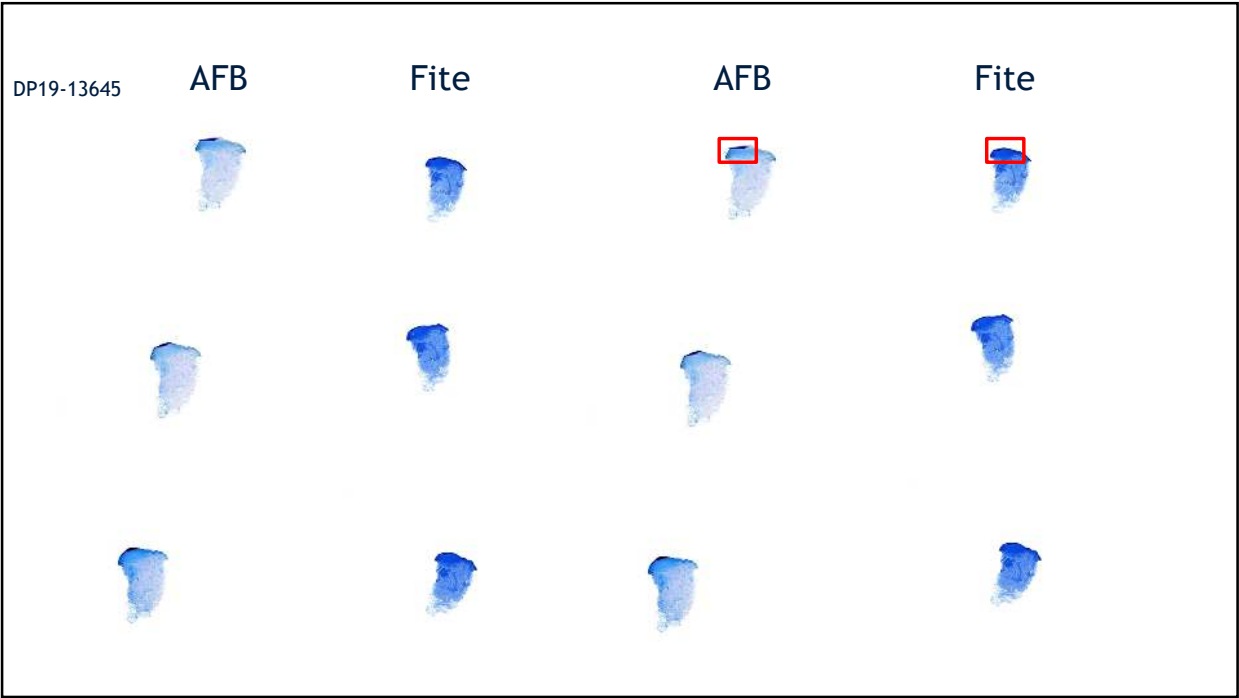
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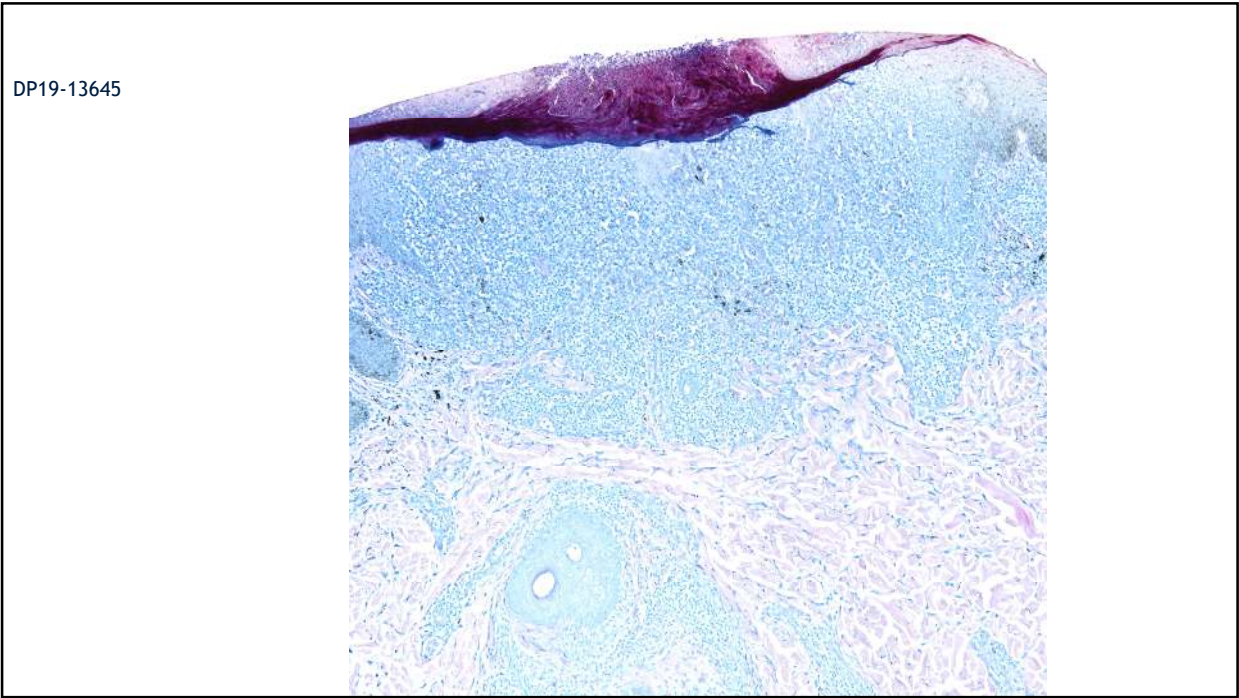
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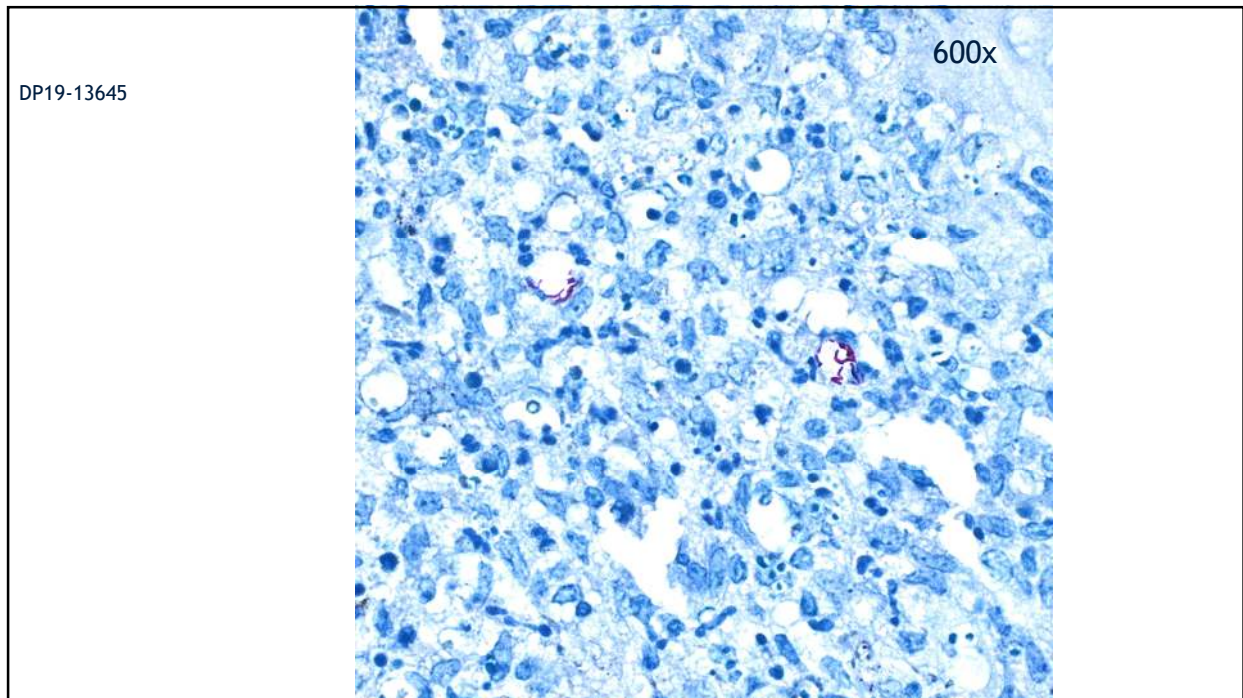
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Laboratory Studies

- Culture grew *Mycobacterium chelonae*

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Case 2



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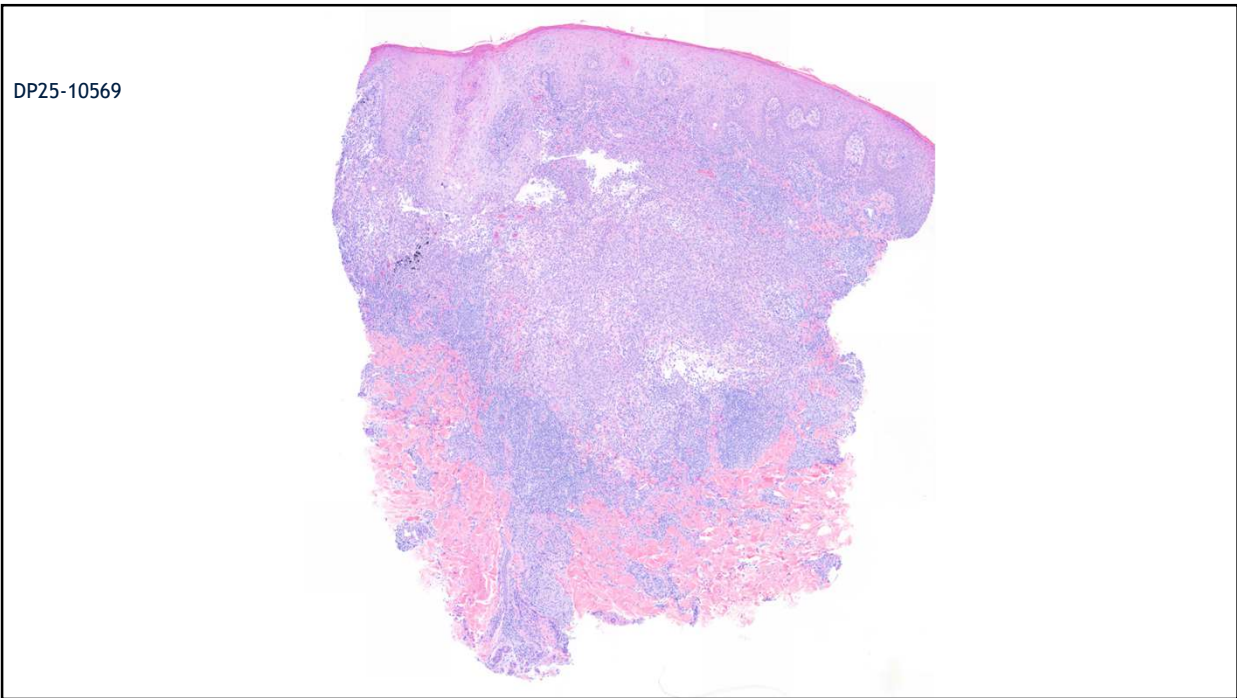
Case 2

HPI: 17-year-old female who presented to clinic with "tattoo irritation" on the left forearm. Patient reports receiving tattoo approximately 3 months ago and the eruption began within a few weeks. Denies previous treatment. No similar spots in other tattoos on body. Otherwise feels well.

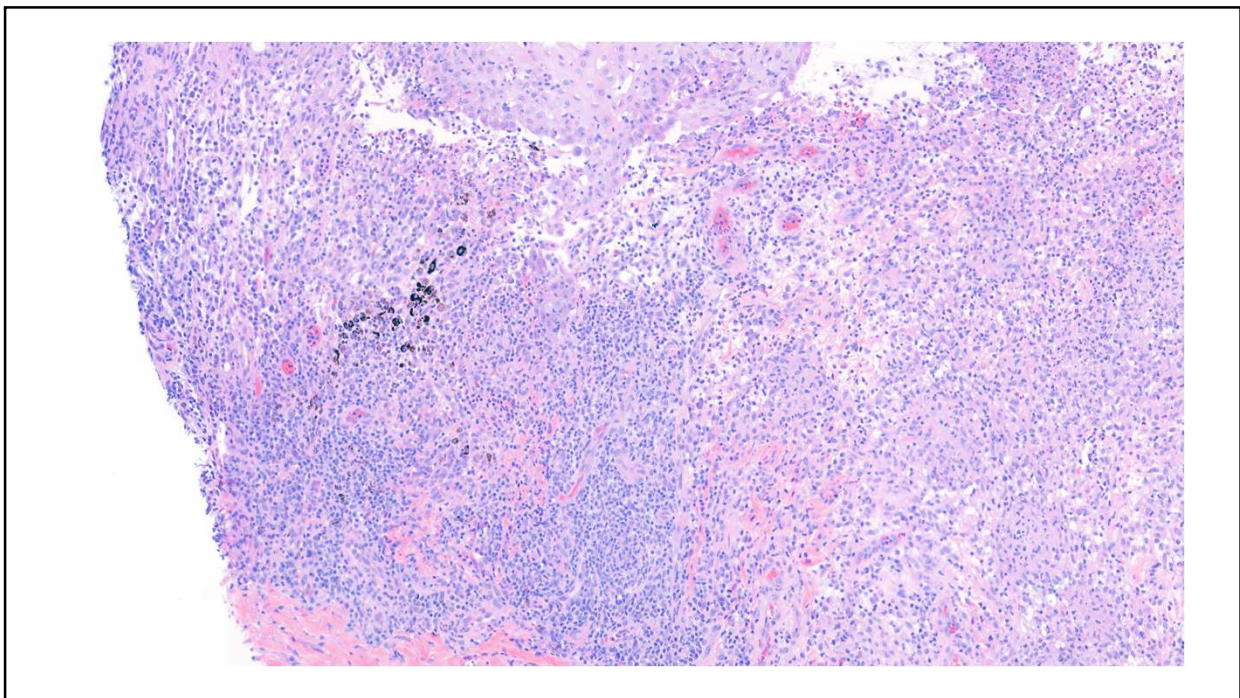
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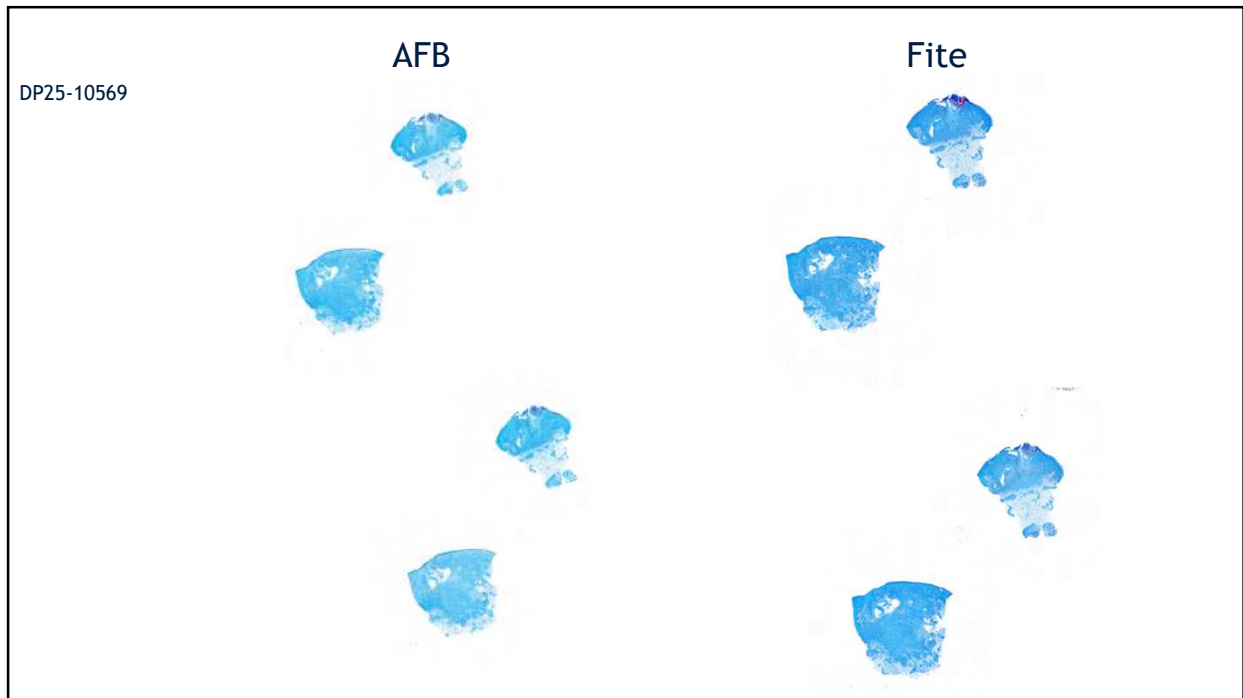
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Laboratory Studies

- Tissue cultures - no growth

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Background

- Community-acquired atypical mycobacterial infections have been linked to *nail salons, acupuncture, and tattoos*
- Atypical mycobacteria are increasingly responsible for SSTIs related to tattooing
- Presents as multiple, tender **erythematous papules**, pustules, or nodules within the border of a tattoo, often limited to one ink color

Griffith DE et al. *Am J Respir Crit Care Med*. 2007;175:367-416.
 Gonzalez-Santiago TM, Drage LA. *Dermatol Clin*. 2015;33:563-577.
 Wentworth AB, Drage LA, Wengenack NL, Wilson JW, Lohse CM. *Mayo Clin Proc*. 2013;88:38-45.
 Yoon S, Kondakala S, Daddy-Gaoh S, Foley S, Kweon O, Kim SJ. *Lancet Microbe*. 2025;6:101006.

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Background

- Outbreaks have been linked to **contamination during dilution** by the tattoo artist and the manufacturer
 - tap, distilled, and reverse osmosis water have been implicated
- Tattoo inks are considered “*cosmetics*” under the FDA, but local jurisdictions regulate the actual practice of tattooing

Griffin I, Schmitz A, Oliver C, et al. *Clin Infect Dis*. 2019;69:949-955.
 Centers for Disease Control and Prevention (CDC). *MMWR Morb Mortal Wkly Rep*. 2012;61:653-656.
 US Food and Drug Administration. *Tattoos and permanent makeup: fact sheet*. Updated 2024. Accessed October 30, 2025.
<https://www.fda.gov/cosmetics/cosmetic-products/tattoos-permanent-makeup-fact-sheet>

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Body Art Regulations



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City of Philadelphia Department of Public Health. *Regulations Governing Operation and Conduct of Tattoo and Body Piercing Establishments*. 2001.



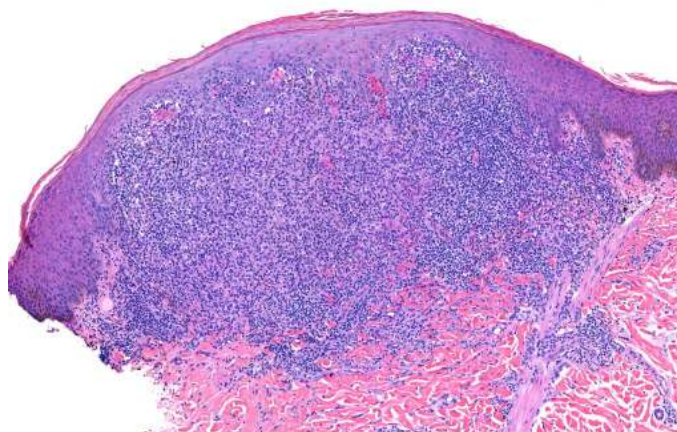
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Diagnosis

- Histopathology: Suppurative granulomatous inflammation



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Diagnosis

- Special stains:
 - AFB, or Ziehl-Neelsen (ZN) stain
 - Fite-Faraco (Fite) stain
- The Fite stain is more sensitive than the ZN stain in detecting atypical mycobacteria (61% vs 21%)
- A negative ZN or Fite does not rule out atypical mycobacteria

Crothers JW, Laga AC, Solomon IH. *Am J Clin Pathol*. 2021;155:97-105.

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Tissue Culture

- Tissue culture is considered the reference standard for diagnosis
- Typically turn positive within 3-7 days, though it can take up to 2-3 weeks in some cases
- Due to special growth requirements, the test is not sensitive

Griffith DE et al. *Am J Respir Crit Care Med*. 2007;175:367-416.

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PCR

- Polymerase chain reaction (PCR) for detecting atypical mycobacterial infections, including *M. chelonae* in tattoo-associated skin infections, demonstrates high sensitivity (88%) and specificity (83%)
- PCR does not provide information on antimicrobial susceptibility, and its limited availability may make it impractical

Abdalla CM, de Oliveira ZN, Sotto MN, et al. *Int J Dermatol*. 2009;48:27-35.

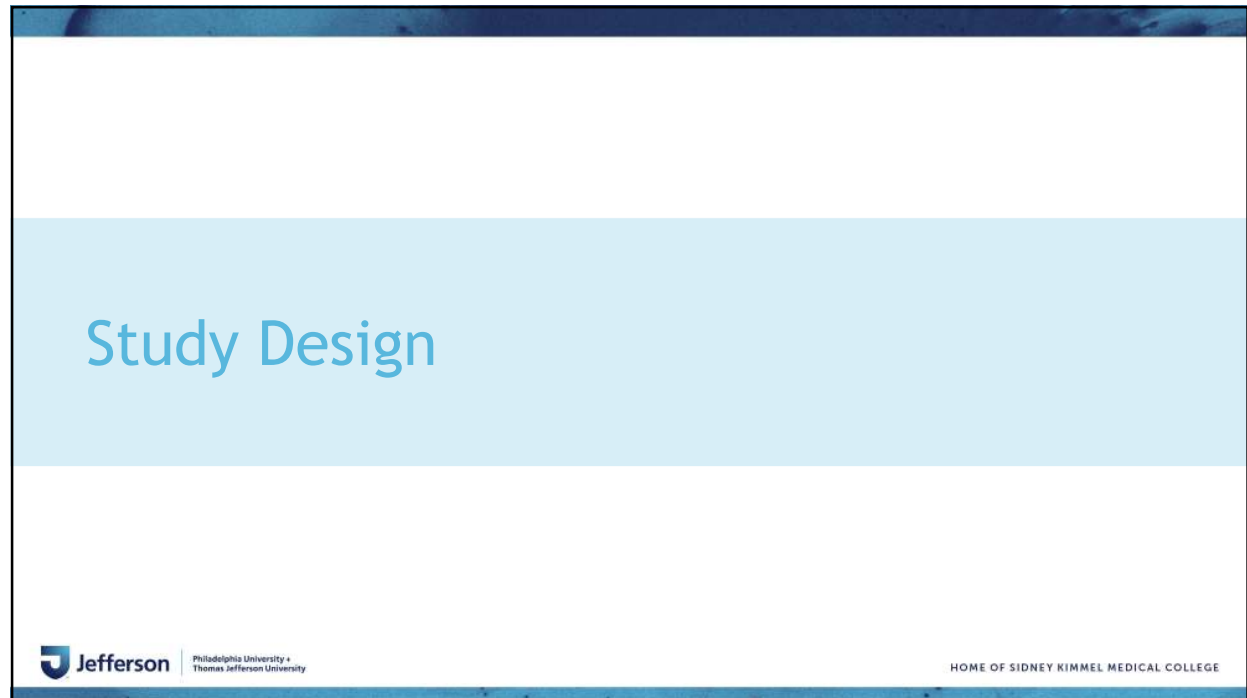
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Background (cont.)

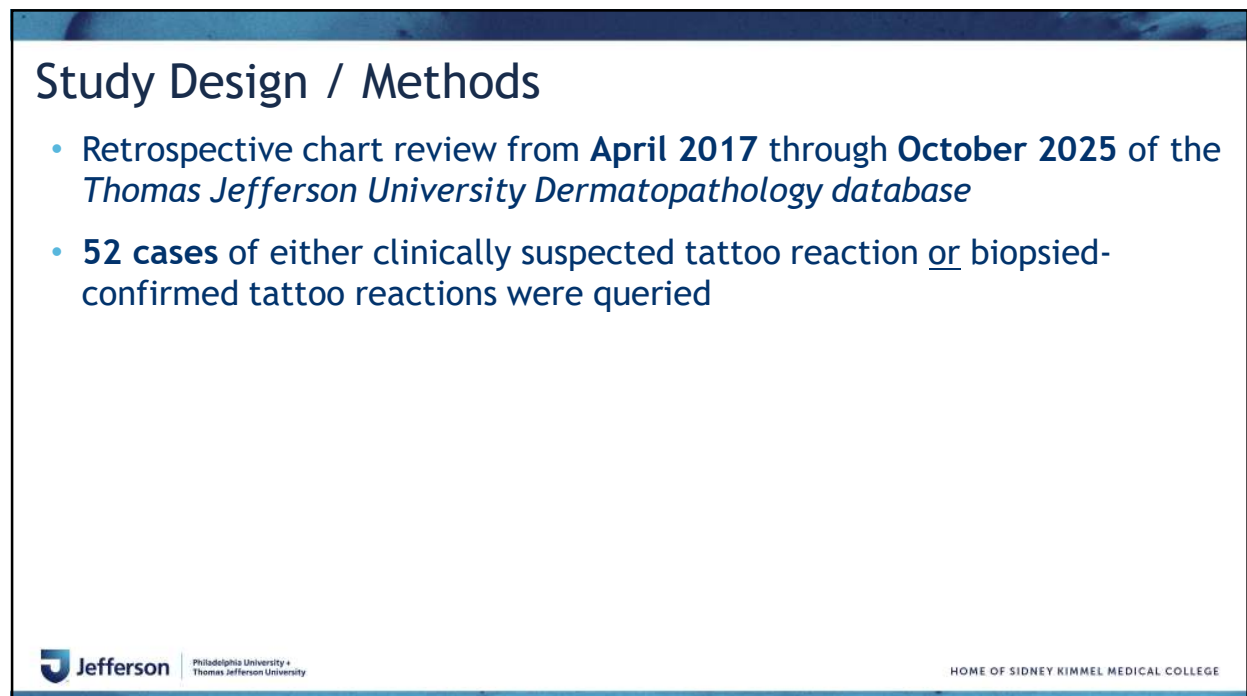
- According to the Infectious Diseases Society of America, atypical mycobacteria tattoo-related infections are considered “**simple**” when they are localized, superficial skin infections in immunocompetent hosts
 - Typically respond to treatment 6-12 weeks of clarithromycin-based combination therapy

Stevens DL, Bisno AL, Chambers HF, et al. *Clin Infect Dis*. 2014;59:e10-52.

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Study Design / Methods

Confirmed tattoo-associated atypical mycobacteria infections:

Culture and/or stain
positive

Probable tattoo-associated atypical mycobacteria infections:

Negative stains and culture, but consistent clinical and histologic features *with* response to antimicrobials

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Study Design / Methods

n = 6

Confirmed tattoo-associated atypical mycobacteria infections:

Culture and/or stain
positive

n = 7

Probable tattoo-associated atypical mycobacteria infections:

Negative stains and culture, but consistent clinical and histologic features *with* response to antimicrobials

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Results (confirmed mycobacterial cases)

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	Location	Pathology	Fite	AFB	PAS	Culture	Treatment
1	Right abdomen	Tattoo + SGD	+	-	-	-	minocycline 100 mg BID x 8 weeks
2	Right distal forearm	SGD	+	+	-	NP	unknown - managed by Infectious Disease
3	Left forearm	Tattoo + SGD	+	+	-	<i>M. chelonae</i>	unknown
4	Left forearm	SGD	NP	+	-	<i>M. chelonae</i> , <i>S. hominis</i>	clarithromycin 500 mg BID x 6 months
5	Left arm	SGD	NP	-	NP	<i>M. chelonae</i>	clarithromycin 500 mg BID x 30 days
6	Right arm	SGD	NP	-	-	Non tuberculous mycobacteria	clarithromycin 350 mg + doxycycline 100 mg BID x 30 days

SGD= suppurative granulomatous dermatitis, NP= test not performed

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Results (probable mycobacterial cases)	
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Clinical Findings

- Presentation: All cases consisted of **MULTIPLE** erythematous papules, nodules, and occasional pustules confined to tattooed area
- Timing: Reactions appeared within 5 weeks of tattooing in all cases with known onset
- Patient profile: Occurred in otherwise healthy, immunocompetent individuals

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	Location	Pathology	Fite	AFB	PAS	Culture	Treatment	Outcome
1	Left hand	Tattoo + SGD	NP	—	—	—	clarithromycin 500mg BID + doxycycline 100mg BID x 60 days	Resolved
2	Left arm	Tattoo + SGD	—	—	—	NP	clarithromycin 500mg BID x 60 days, doxycycline 100mg BID x 30 days	Resolved within 1 month
3	Shoulders	SGD	NP	—	—	NP	clarithromycin 500 mg daily x 60 days	Resolved
4	Left arm	SGD	NP	—	NP	NP	clarithromycin 500 mg BID, Doxycycline 100 mg BID x 30 days	Resolved within 1 month
5	Left forearm	SGD	—	—	—	—	clarithromycin 500 mg BID x 30 days, doxycycline 100 mg BID	Resolved
6	Posterior neck	Tattoo + SGD + PEH	—	—	—	—	clarithromycin 500 mg BID + doxycycline 100 mg BID x 120 days	Resolved within 1 month
7	Left arm	Tattoo + SGD + ↑ mucin	NP	—	NP	NP	clarithromycin 500 mg BID, doxycycline 100 mg BID	Unresolved, did not treat

SGD= suppurative granulomatous dermatitis, PEH= pseudoepitheliomatous hyperplasia, NP= test not performed

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Key Takeaways

If physical exam reveals **numerous papules or nodules** confined to the **tattooed area**



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Key Takeaways

If physical exam reveals **numerous papules** or **nodules** confined to the **tattooed area**

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Suppurative granulomatous dermatitis

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Tattoo-associated atypical mycobacterial infection

Key Takeaways

Empiric therapy is warranted when clinicopathologic correlation supports atypical mycobacterial infection

Limitations

- Retrospective, single-dermatopathology center design
- Culture not performed in several suspected cases
- PCR not routinely available

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Acknowledgements

Jason Lee, MD

Shayan Waseh, MD

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