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### **Authors**

Puneky, Daniel

Fernandez, John D.

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## CLINICAL VIGNETTE

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### Hot Tub Mastitis

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Daniel Punecky, MD and John David Fernandez, MD

David Geffen School of Medicine at UCLA

#### Case

A 29-year-old female patient with no significant past medical history presented to clinic with a rash and left breast pain. She had traveled to Central America one month prior, but remained in the city throughout her trip. She did not develop any gastrointestinal symptoms or other illnesses, and did not come into contact with any undomesticated animals. She also recently visited a nearby town on the California coast for several days, staying in a resort hotel with a small group of friends. The hotel had a hot tub and the group spent many hours lounging in a hot tub.

At presentation, she had a widespread tender, pruritic papular and papulopustular rash over the back, abdomen, buttocks, arms, legs and left breast. She reported left breast soreness present upon waking that morning, which had rapidly worsened throughout the day. There was a 2cm area of tender swelling with induration and erythema involving the superior left areola and surrounding skin. There was no fluctuance or crepitus nor was there axillary lymphadenopathy. She reported malaise, but denied fever, chills or any other systemic symptoms. She was afebrile with a normal heart rate and blood pressure. One of her traveling companions had a similar rash, but did not seek care because it was mild and did not involve the breast.

A swab of material expressed from a pustular lesion was sent for culture. Given the rapid progression of breast swelling and pain she was started on empiric ciprofloxacin for presumed hot tub folliculitis and mastitis. She had improvement in breast pain and rapid resolution of the rash within 24 hours. Culture grew *Pseudomonas aeruginosa*. By day 7, she had complete resolution of the breast pain, swelling and erythema.

#### Discussion

*Pseudomonas aeruginosa* is an aerobic, gram-negative, nonfermenting bacillus that is common in the environment and is a frequent cause of healthcare associated infections, particularly in the ICU.<sup>1</sup> It is an important pathogen in major burn wound infections, but can cause other skin and soft tissue infections as well. *P. aeruginosa* folliculitis—informally referred to as “hot tub folliculitis”—typically appears within 8-48 hours after exposure to a contaminated water source and is associated with hot tubs that are not sufficiently chlorinated.<sup>2</sup> *P. aeruginosa* is intrinsically resistant to many classes of antibiotics, and it can

also acquire resistance to those which it is not intrinsically resistant. In the absence of acquired resistance, empiric treatment of *P. aeruginosa* requires the use of anti-pseudomonal penicillins (ex. piperacillin-tazobactam), 4<sup>th</sup> generation cephalosporins (ex. Cefepime, ceftazidime), the monobactam aztreonam, the fluoroquinolones ciprofloxacin and levofloxacin, or meropenem.<sup>3</sup> Aminoglycosides are active against *P. aeruginosa*, but are not generally used as monotherapy because of insufficient efficacy due to poor penetration at many sites, such as the lungs.<sup>4</sup> More advanced agents are available in the event of acquired resistance. Outpatient treatment of *P. aeruginosa* is complicated by the fact that the only currently available oral antibiotics to which it is not intrinsically resistant are ciprofloxacin and levofloxacin. Inability to use one of these agents due to allergy, contraindication or acquired resistance necessitates either outpatient parenteral therapy or hospital admission.

Mastitis is an inflammatory condition that causes pain, swelling and erythema of the breast. Lactational mastitis is well recognized and is estimated to occur in approximately 20-33% of breastfeeding women.<sup>5,6</sup> Non-lactational mastitis is less common and may or may not be infectious in nature. While the diagnosis of mastitis is clinical, the presence of infectious signs should prompt further evaluation. If there is concern for abscess, ultrasound may be used to further characterize. If there is discharge, cultures should be obtained. In infectious mastitis, cultures are reported positive in 62 to 85 percent of cases and the most common pathogen is not pseudomonas but instead include staphylococci, corynebacterium, enterococci, anaerobic streptococci, *Bacteroides*, and *Proteus*.<sup>6,7</sup> Typical empiric antibiotic therapy for mastitis includes amoxicillin-clavulanate monotherapy or cephalexin with metronidazole dual therapy.<sup>8</sup> If there are risk factors for methicillin resistant *Staphylococcus aureus*, it is prudent to include coverage with doxycycline or trimethoprim-sulfamethoxazole.

This case highlights the importance of attention to not only the patient’s presenting symptoms but also the context in which those symptoms began. While our patient was not infected with the most common organisms, the key was her co-existent widespread folliculitis and recent prolonged use of a hot tub. Had she typical empiric therapy for mastitis, therapy would have failed due to the intrinsic antibiotic resistance of *P.*

*aeruginosa*. Instead, she had a rapid and full response to an anti-pseudomonal agent with an excellent outcome.

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