# Case Report

# Methicillin-Resistant *Staphylococcus aureus*

**Urgent message:** Accurate, early diagnosis and appropriate antibiotic treatment of MRSA is essential to prevent subsequent morbidity and mortality.

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## Case Presentation

A 22-year-old white female presents to the urgent care clinic with a complaint of an infected spider bite on her left upper thigh. She first noted a pimple-like lesion approximately a week before presentation. The lesion has subsequently grown and developed a central, black area with surrounding warmth, redness, and pain. She denies any fever or chills or concurrent similar lesions elsewhere. She has been applying topical neosporin to the area, with no improvement

The patient has not been in a health care facility over the past year.

## Observations and Findings

*Physical Exam*

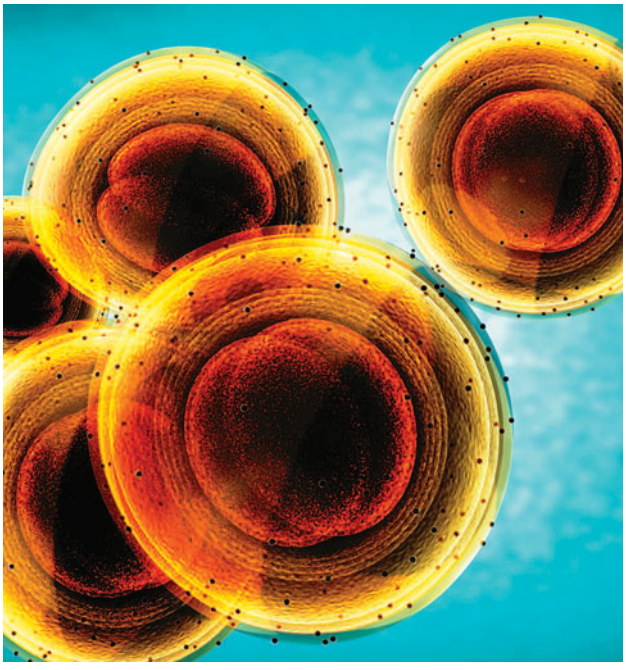
On examination the woman is alert, oriented, and in no acute distress.

Temp: 98.0 °F

BP: 102/60 mmhg

Initial local exam revealed the following: Raised, erythematous, circular area approximately 3 cm in diameter with a necrotic center with a scab. It was tender to palpation. No fluctuation was noted.

A scalpel was used to deroof the central area and culture taken and sent for routine stain and culture. A dressing was applied over the lesion.



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## Disposition

The patient declined a tetanus vaccine. She was started on doxycycline pending culture results. Short-term pain medications were prescribed. Detailed discussion was held on the need to monitor her symptoms and to return in case of worsening.

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## Laboratory Results

The culture and stain results revealed many gram-positive methicillin-rResistant *Staphylococcus aureus* (MRSA) clusters with susceptibility to tetracycline and trimethoprim/sulfamethoxazole.

## Follow up

The patient called the office 2 days later stating she was not toleratig the oral doxycycline because of gastrointestinal upset. The antibiotic was changed to Bactrim DS. Culture results were still pending.

When the culture report was received, the patient was called and a message was left instructing her to continue the Bactrim DS, complete the course of treatment, and follow up as needed.

The patient called back after a few days, stating that she had developed a new lesion near the original site. She was seen the same day and admitted to not taking the doxycycline or getting the prescription for Bactrim DS filled. On exam she was noted to have a red, raised, 2-cm papule adjacent to the original lesion. She was advised to have her prescription for Bactrim DS filled, complete the entire course, and follow up if lesions did not resolve or worsened.

## Discussion

Since it was first reported in 1968, MRSA has emerged as one of the major etiologic agents in both nosocomial and community-acquired infections.

Recent data indicate that the incidence of life-threatening invasive hospital-acquired MRSA (H-MRSA) is declining, but similar trends have not been seen in the incidence of community-acquired MRSA (CA-MRSA).[1]

Occurring in a population with none of the traditional risk factors for MRSA, CA-MRSA has a higher incidence in certain populations and has increased exponentially since the 1990s. Children younger than age 2 years, African-American populations, Native Pacific islanders, and Alaska Natives appear to be at higher risk, as are athletes, individuals in correctional facilities, and military recruits. *Streptococcus* is the major etiologic agent for nonpurulent skin infections /cellulitis. The majority of purulent skin and soft-tissue infections (SSTIs), however, are caused by *Staphylococcus,* with MRSA overtaking MSSA as the major strain. A 2006 study published in *The New England Journal of Medicine* stated that MRSA was responsible for 59% of purulent SSTIs.[2]

More recent studies show an even higher incidence in certain populations. C-MRSA was responsible for up to 75% of infections in children in certain regions and up to 61% in all patients presenting to a community primary care clinic system with SSTIs.[3,4]

Health care providers at urgent care centers and Emergency Departments are the initial and often only source of care for these patients. CA-MRSA infections usually target skin and soft tissues, presenting as pustules or boils. The initial presentation is a raised, red, painful area, with or without necrosis which is often misdiagnosed as a spider bite by the patient. Deeper infections such as osteomyelitis, pneumonia, and pyomyositis have also been reported.

As drug resistance becomes an increasing problem, it is very important that urgent care and primary care providers be familiar with not only the judicious use of antibiotics but also the appropriate antibiotics to treat these infections.

In 2011, The Infectious Disease Society of America (IDSA) released its first Evidence-Based Guidelines for the treatment of MRSA infections.[5] The guidelines have been endorsed by the Pediatric Infectious Disease Society, The American College of Emergency Physicians, and The American Academy of Pediatrics. The guidelines are listed along with Strength of Recommendation and a Summary of Evidence and provide clear direction about which antibiotics are preferred under different circumstances.

In Summary they state:

- For uncomplicated simple skin abscesses and boils, incision and drainage should be the primary management .This is often all that is necessary. **A11**
- Antibiotics should be considered in the presence of more complicated presentations like multiple sites of infection, associated systemic symptoms, immunosuppressed host, septic phlebitis, or failure of response to incision and drainage.
- Every effort should be made to obtain a culture and, in case of purulent cellulitis, associated abscess or presence of systemic symptoms, empirical therapy for CA-MRSA should be started pending culture results. **A11**
- In the case of outpatients with no purulent drainage or exudate and no associated abscess, empirical therapy for infection due to beta–hemolytic streptococci is recommended except in patients who do not respond to betalactam therapy or have systemic symptoms. **A11**

## Preferred antibiotics

For empirical coverage of CA-MRSA SSTIs in the outpa-

tient setting, recommended antibiotics are:

- Clindamycin, trimethoprim–sulfamethoxazole (TMP-SMX), a tetracycline (doxycycline or minocycline), and linezolid. **A11**

For both beta-hemolytic streptococci and CA-MRSA coverage, options include clindamycin alone, or TMP–SMX or a tetracycline in combination with a beta–lactam (i.e., amoxicillin) or linezolid alone.**A11** While use of Zyvox or Linezolid is also an A11 recomendation by the IDSA, cost and reports of emerging resistance raise concerns about its use as first-line therapy.[5] The use of rifampin as a single agent or as adjunctive therapy for the treatment of SSTIs is not recommended. **A111.**

## Indications for hospitalization

Although most cases of CA-MRSA can be treated on an outpatient basis, hospitalization is required for certain patients. Indications include the presence of systemic symptoms, toxic appearance, unstable co-morbid conditions, necrotizing fasciitis and/or limb- or life-threatening infection.[6]

## Points to remember

A high degree of clinical suspicion must be maintained when seeing patients with skin infections and presumed insect bites. Cultures should be taken whenever possible and coverage for CA-MRSA provided in the presence of purulent infections. ■

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