

# Pediculosis As a Possible Contributor to Community-Acquired MRSA Bacteremia and Native Mitral Valve Endocarditis

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## *Abstract*

Methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia is a known cause of infective endocarditis. In this case report, we describe a patient with community-acquired MRSA bacteremia and subsequent mitral valve endocarditis. This patient was noted to be without commonly recognized risk factors for MRSA bacteremia, thus her likely source was skin colonization, with skin trauma facilitated by pediculosis infestation.

## *Case Presentation*

An elderly woman was brought to the Emergency Department after being found down. A bystander called EMS after finding her lying on the ground next to a pool of emesis. Per EMS, the patient was found to have pinpoint pupils with Glasgow Coma Scale (GCS) 4-1-4, with only minimal improvement with a dose of naloxone. After admission she was noted to be afebrile, with a III/VI systolic murmur and an extensive infestation of lice in her hair. Urine toxicology screen was negative. CT radiography of her head was negative for acute intracranial pathology, with chronic ischemic changes. Blood cultures were drawn from two peripheral sites, but as the patient was afebrile without leukocytosis, she was not started on antibiotics. Her identity was later confirmed, and she was noted to be 72 years old with a history of homelessness. She had previously denied a history of IV drug abuse or previous surgeries, and was not noted to be hospitalized recently.

On the second day of hospitalization, her mentation improved, and she was described as coherent on exam. However, she became febrile to maximum temperature 38.5° C with

a new leukocytosis to 14,500. Two of two blood cultures, drawn on admission, resulted in gram positive cocci with clusters, and she was started on empiric vancomycin therapy. The initial two blood cultures, as well as two repeat blood cultures later speciated to methicillin-resistant *Staphylococcus aureus* (MRSA). MRSA nares swab results were negative. However, as the patient was noted to have persistent pediculosis infestation, a possible source of MRSA bacteremia was skin colonization introduced to her bloodstream through excoriations. An infectious disease specialist was consulted, who recommended a transthoracic as well as a transesophageal echocardiogram.

Transthoracic echocardiography (TTE) revealed a moderate mobile vegetation on the posterior mitral valve leaflet (Figure 1A), as well as severe mitral regurgitation (Figure 1B).

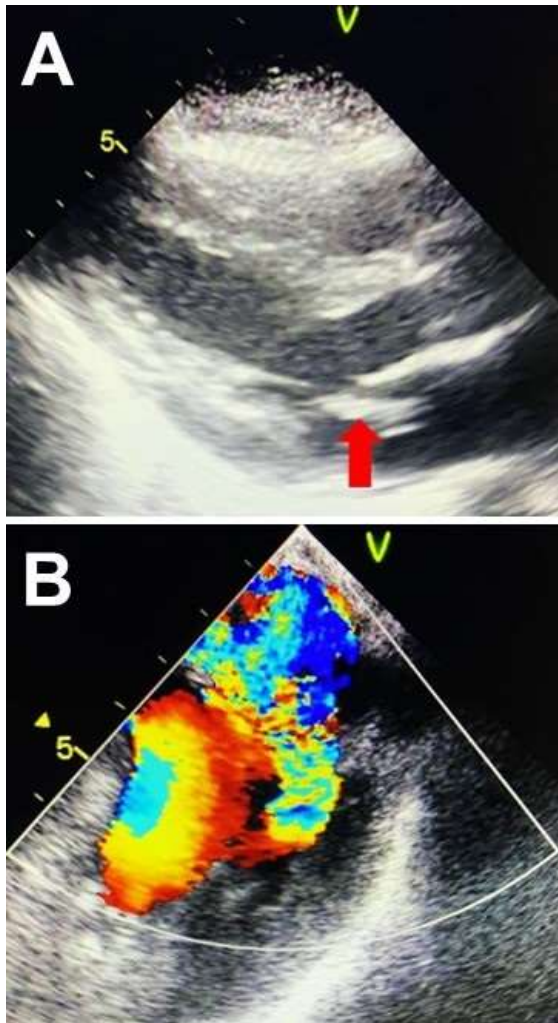


Figure 1. Transthoracic echocardiography showing large vegetation on posterior leaflet of mitral valve (A) and severe mitral regurgitation resulting from large vegetation (B).

Left ventricular ejection fraction was reported to be 55-60%, with no other vegetations noted. On day five of hospitalization, the patient underwent transesophageal echocardiography (TEE), which revealed large vegetation on the posterior leaflet measuring 2.5 x 0.8 cm (Figure 3) causing severe mitral regurgitation (Figure 2).

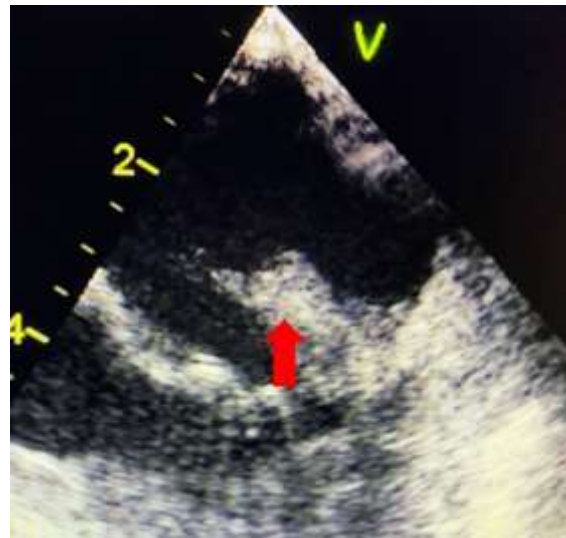


Figure 2. Transesophageal echocardiography redemonstrating large vegetation on mitral valve (red arrow), measuring 2.5 x 0.8 cm.

A cardiothoracic surgery evaluation was obtained for mitral valve replacement, and she was deemed a surgical candidate. In preparation for surgical intervention, cardiac catheterization was performed, which revealed no coronary artery disease. The patient's pediculosis was noted to persist despite three topical treatments and two doses of oral ivermectin, and an additional dose of ivermectin was planned. Two repeat blood cultures resulted in no growth, and the patient was pending cardiothoracic surgery. However, on the day of surgery, the patient elected to leave against medical advice (AMA) despite extensive counseling. She had received 18 days total of IV vancomycin.

### *Discussion*

MRSA continues to cause significant morbidity and mortality both in healthcare and community populations. *S. aureus* bacteremia can often cause complications, most concerning infective endocarditis, osteomyelitis, and sepsis. Incidence of community-acquired MRSA bacteremia, including healthcare-associated cases, has

increased in recent years, surpassing rates of hospital-acquired infections globally (1-3). MRSA colonization increases the risk of MRSA infections and bacteremia; in a study of 29371 hospitalized patients, MRSA-colonized (per nasal swab) patients were 19.89 times more likely to develop bacteremia than non-colonized patients (4). Sites of *S. aureus* colonization include the nares, nasopharynx, skin, wound sites, and vascular catheters. Once colonized, traumatic injury or disruption can facilitate invasion of *S. aureus* into deeper structures of the skin, which can in turn lead to bacteremia.

There have been no documented cases of pediculosis as a contributor to MRSA bacteremia. However, lice have been identified as vectors for several pathogens, including *Bartonella quintana*, *Rickettsia prowazekii*, and *Borrelia recurrentis* (5). In particular, pediculosis has been shown to be associated with *B. quintana* seroconversion and bacteremia in a study of homeless individuals (6). *B. quintana* is a gram negative bacteria transmitted by responsible for trench fever in World War I, during which it was transmitted by lice. More recently, it has been reported to cause bacillary angiomatosis, acute and chronic bacteremia, and endocarditis, with homeless persons and individuals with alcoholism at significant risk (7). *Bartonella* species including *B. quintana* have recently been described as emerging causes of culture-negative endocarditis (8). Notably, one case report documents a patient with a history of pediculosis, found to have culture-negative endocarditis. TEE revealed a 2.5 x 0.9 cm vegetation on the mitral valve and several small vegetations on the aortic valve. Serology was positive for both *B. quintana* and *B. henselae*, and rRNA sequencing confirmed *B. quintana* infection of both valves (9).

On TEE, our patient was shown to have a large vegetation on the mitral valve,

measuring 2.5 x 0.8 cm in diameter. Given the high risk of embolization and severe mitral valve replacement surgery was highly recommended. Per ID specialist, a six-week course of antibiotics was also recommended for complicated bacteremia. Unfortunately, the patient left against medical advice (AMA) before surgical intervention and before an appropriate duration of antibiotics.

The source of this patient's bacteremia was initially unclear, as she did not have common risk factors for MRSA bacteremia. She denied IV drug use, was not recently admitted to a hospital or nursing facility, did not have any chronic conditions or prosthetic devices, and was found to have a negative MRSA nares swab. Thus, her source of infection was possibly skin colonization with MRSA, with introduction into her bloodstream facilitated by excoriations due to persistent pediculosis infestation. She was noted to have a significant amount of lice despite several topical and oral medications, and left AMA before completing a three-dose course of ivermectin.

### *Conclusion*

In this case report, we describe a patient with community-acquired MRSA bacteremia and subsequent mitral valve endocarditis. In the absence of common risk factors, her likely source of infection was considered to be skin colonization, with skin barrier disruption from excoriations due to pediculosis.

### *References*

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