HAIR TRANSPLANT forum INTERNATIONAL

INTERNATIONAL SOCIETY OF HAIR RESTORATION SURGERY

Volume 18, Number 4
July/August 2008

COLUMNS

FEATURE ARTICLES

Hair restoration in the age of MRSA

Robert H. True, MD, MPH *New York, New York*

Introduction

The emergence of multi-drug-resistant organisms (MDROs) is a worldwide phenomenon and is changing the practice of medicine throughout all specialties. The most important MDRO for surgical settings is methicillin-resistant Staphylococcus aureus (MRSA). It is timely to specifically explore how the emergence of MRSA is impacting the field of hair restoration surgery and to examine what preventive and management strategies are needed by our specialty.

Background

During the past several decades, the prevalence of MDROs in hospitals and medical centers worldwide has increased steadily. MRSA was first isolated in the United States in 1968. By the early 1990s, MRSA accounted for 20%–25% of *Staphylococcus aureus* isolates from hospitalized patients. In 1999, MRSA accounted for more than 50% of *S. aureus* isolates from patients in Intensive Care Units (ICUs) in the National Nosocomial Infection Surveillance (NNIS) system; in 2003, 59.5% of *S. aureus* isolates in NNIS ICUs were MRSA.

By the late 1990s, MRSA isolates began to become identified outside of the hospital setting, and now are widespread in many communities around the world. Thus, MRSA infections are now differentiated as hospital acquired (HA-MRSA) or community acquired (CA-MRSA), and are recognized as different strains with different behaviors.

When patients with HA-MRSA have been compared to patients with methicillin-susceptible *S. aureus* (MSSA), MRSA-colonized patients more frequently develop symptomatic infections. Furthermore, higher case fatality rates have been observed for certain MRSA infections, including bacteremia, post sternotomy mediastinitis, and surgical site infections.

CA-MRSA infection presents most commonly as relatively minor skin and soft tissue infections, such as impetigo, recurrent furuncles, and cellulitis, but severe invasive disease, including necrotizing pneumonia, necrotizing fasciitis, severe osteomyelitis, and a sepsis syndrome with increased mortality have also been described in children and adults. A very common presentation is that of a solitary boil that may be mistaken by the patient as a "spider bite" (Figure 1).

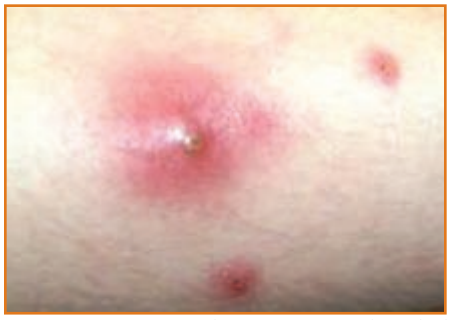

Figure 1. MRSA commonly presents as a solitary boil that is often mistaken as a spider bite.

One of the major differences between HA-MRSA and CA-MRSA is their resistance patterns. HA-MRSA is responsive only to intravenous vancomycin (some vancomycin-resistant strains are now appearing), linezolid, daptomycin, or quinupristin-dalfopristin; whereas CA-MRSA is usually sensitive to clindamycin, tetracyclines, trimethoprim-sulfa, rifampin, and flouroquinolones.

Although acquired in the hospital setting, most HA-MRSA cases occur outside of the hospital. The CDC defines HA-MRSA as an infection occurring in individuals who have been hospitalized or received surgery within the past year, who have a permanent indwelling medical device, who reside at a long-term-care facility, or who have recently received dialysis.

There is ample epidemiologic evidence to suggest that HA-MRSA is carried from one person to another via the hands of Health Care Providers (HCPs). Occasionally, HCP can become persistently colonized with MRSA, but these HCPs have a limited role in transmission, unless other factors are present. Additional factors that can facilitate transmission include chronic sinusitis, upper respiratory infection, and dermatitis.

Although estimates vary, about 1% of the general population is colonized with CA-MRSA. In high-risk groups, MRSA nasal colonization is as high as 35% of *S. aureus*–positive cultures. It is transmitted by the hands, which may be contaminated by (1) contact with colonized or infected individuals, (2)

⇨ page 129

Age of MRSA

from page 121

colonized or infected body sites of other persons, or (3) devices, items, or environmental surfaces contaminated with body fluids containing MRSA. Poor hygiene, crowded conditions, openings in the skin such as cuts or abrasions, and skin-to-skin contact are additional factors that can contribute to transmission.

Decolonization

Colonization indicates the presence of MRSA without illness. Colonization can occur in the nares, trachea, skin folds, rectum, or in an open wound. Decolonization entails treatment of persons colonized with MRSA to eradicate carriage of that organism. Decolonization of persons carrying MRSA in their nares has proved possible with several regimens that include topical intranasal mupirocin alone or in combination with orally administered antibiotics (e.g., rifampin in combination with trimethoprim-sulfamethoxazole or ciprofloxacin) plus the use of an antimicrobial soap for bathing. In one report, a 3-day regimen of baths with providone-iodine and nasal therapy with mupirocin resulted in eradication of MRSA colonization.

MRSA cases are likely to occur in hair transplant practice and should be suspected in any wound or post-surgical infection. Cultures should be taken prior to initiating therapy, and therapy should be guided by the sensitivity patterns identified in culture.

HCPs implicated in transmission of MRSA are candidates for decolonization and should be treated and culture negative before returning to direct patient care. In contrast, HCPs who are colonized with MRSA but are asymptomatic, and have not been linked epidemiologically to transmission, do not require decolonization.

Although decolonization is effective, high recurrence rates make routine screening and decolonization of HCP or community groups an ineffective strategy unless performed within the context of epidemic MRSA (E-MRSA). Decolonization is indicated in patients with recurrent MRSA infections and for HCPs implicated in an outbreak.

ISHRS Member Survey

To assess the current status of MRSA in hair restoration, practice surveys were mailed to 207 ISHRS members. Ninety-three surveys were returned (45% response rate). We did not have a protocol to analyze nonresponders. Fourteen MRSA cases were reported by the 93 practices. Two practices had 2 cases; two, 3 cases; one, 4 cases, and nine reported 1 case each. This suggests that MRSA infections are occurring in 9.6% of the HT practices surveyed. The 93 practices perform 24,241 hair restoration procedures per year. In the past 12 months, the surveyed practices experienced 6 MRSA cases, which is a 0.25/1000 incidence rate of MRSA infection among hair restoration surgeries. This is a low-risk occurrence rate; however, busy practices that perform 500 or more procedures per year can expect a case every four years. Certainly, if a practice were to experience two or more infections within a year, there would be cause to suspect the infections may be arising from within the practice.

We asked survey participants to describe their current screening and preventive practices. Results are summarized in Table 1.

Table 1. MRSA Practice Survey (n = 93)

	NA	Yes	No
Has MRSA occurred in practice?	0	14	79
MRSA cases within past 12 months?	0	6	87
Nasal Culture screening of employees?	5	5	83
Regular Staff carrier screening?	0	1	92
Patient screening for MRSA?	0	1	92
Hand washing polices?	0	82	11
Hand sanitizer policies?	0	64	29
Made changes in practice because of MRSA risk?	0	18	75

Very few of the practices have performed any colonization screening of staff or patients. On the other hand, most use hand washing/sanitizer policies. Eighteen of the 93 practices have made policy and procedure changes in view of MRSA. Of practices that have had MRSA cases, 56% have changed procedures to reduce risk of future cases. Measures taken have included: mandatory washing/sanitizer policies, introduction of routine pre-op Hibiclense scalp scrubs, routine use of doxycycline post-op, and use of Technicare (Active Ingredients: USP Chloroxylenol 3.0%, Cocamidopropyl PG-Dimonium Chloride Phosphate 3.0%) on the donor wound.

The hair transplant MRSA infection cases reported included donor wound infections (Figure 2), folliculitis, and impetiginous scalp lesions.

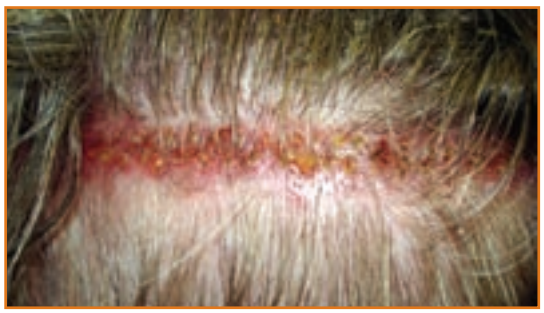

Figure 2. MRSA donor wound infection. *Photo courtesy of William M. Parsley, MD.*

Prevention and Treatment in Hair Restoration Practice

The key to prevention of outbreaks within a clinic is strict adherence to hand washing/and use of hand sanitizers. Specific and strict policies need to be in place and monitored for compliance. Compliance is facilitated by locating wash/sanitizer stations outside each treatment room. This

page 130

Age of MRSA

⇦ from page 129

practice must be accompanied by meticulous and consistent disinfection of all work surfaces and equipment.

Given the low incidence of MRSA infection in HT practice, the occurrence of two cases close together should raise suspicion that the source may be coming from the clinic. It is appropriate to screen clinical staff with nasal cultures and initiate decolonization of any who are found to be positive. Furthermore, sanitation procedures should be reviewed.

However, most hair transplant surgery–related MRSA infections will be CA-MRSA arising from individual patients who are colonized. While it is not cost effective to do nasal swab screening on all patients, it does make sense to do risk screening of all patients by including pre-op questionaires on recent hospitalizations or surgery, contact with a MRSA case, recent boils, or chronic conditions associated with open skin lesions. If increased risk is identified, pre-op nasal culture screening would be appropriate and, if positive, decolonization would be indicated.

Despite carefully adhering to infection control practices and screening for high-risk patients, MRSA cases are likely to occur in hair transplant practice and should be suspected in any wound or post-surgical infection. Cultures should be taken prior to initiating therapy, and therapy should be guided by the sensitivity patterns identified in culture. If infections are treated empirically with beta-lactams or macrolides pending culture results, patients should be followed closely.

Table 2 summarizes current recommended MRSA treatment protocols . Practitioners need to be aware of resistance patterns in their communities and use this knowledge in selecting antibiotics. Choice of antibiotic will evolve as MRSA sensitivity changes.

References

1. Siegel, J.D., et al. Management of multi-drug-resistant organisms in healthcare settings. *CDC HICPAC* 2006; 1–70.
2. Gemmell, C.G. Guidelines for prophylaxis and treatment of methcillin-resistant *Staphylococcus aureus* (MRSA) infections in the UK. *J of Antimicrobial Chemotherapy* 57(4):589-608.
3. Bartlett, J.G. Community acquired methcillin-resistant *Staphylococcus aureus*. Highlights of the Infectious Diseases Society of America 43rd Annual Meeting. October 2005:1-14.
4. Health Plan of Nevada. Protocol for the treatment of methcillin resistant Staphylococcal aureus (MRSA). July 2005:1-3.
5. Gorwitz, R.J., et al. Strategies for clinical management of MRSA in the community: Summary of and experts meeting convened by the Centers for Disease Control and Prevention. 2006:1-24.✧

Table 2. MRSA Treatment Guidelines

Colonization *(Recommended only for HCP implicated in case cluster, outbreaks, or high-risk patients.)*	• Nasal Mupiricin ointment bid for 5 days, plus, • Trimehtoprim/sulfa double strength po bid for 10 days • Or, Minocycline or doxycylcine 100 mg po bid 10 days, plus, • Providine/iodine baths for 3 days
Superficial colonization of a wound without signs of infection	• Regular cleaning with Hibiclens • Topical application of silver dressing with activity against MRSA (Acticoat or Silvasorb) or Mupiricin ointment • Close monitoring for signs of infection
Superficial skin and soft tissue infection cellulitis (HA or CA MRSA) *(Antibiotic choice should be determined by local resistance patterns.)*	• Local wound cleaning and debridement • Topical Mupiricin • Trimehtoprim/sulfa double strength po bid for at least 10 days • Or, Minocycline or doxycylcine 100 mg po bid for at least 10 days • Plus, Rifampin 300mg po bid X 5 days • If failure of above measures, • Infectious Disease consult • Zyvox (linezolid) 600mg po Q12h (monitor for myelosuppression if longer than 10 days
Complex skin and skin structure infection *(Antibiotic choice should be determined by local resistance patterns.)*	• Aggressive debridement essential • Topical Mupiricin • Trimehtoprim/sulfa double strength po bid for at least 10 days • Or, Minocycline or doxycylcine 100 mg po bid for at least 10 days • Plus, Rifampin 300mg po bid X 5 days • If failure of above measures, or known HA-MRSA • Infectious Disease consult • Zyvox(linezolid) 600mg po Q12h or vancomycin iv