The overriding goal of chemoimmobilization of cutaneous wounds is to eliminate dynamic tension on the healing tissues. Paralysis of the muscle groups adjacent and subjacent to the wound should therefore be as complete as possible.

As illustrated in the cases presented herein, the dosages applied for wound healing in the lower face resemble those used for the treatment of spasticity and are substantially larger than those for cosmetic purposes. The applied dosages resulted in clinically near-complete elimination of dynamic tension on the healing wounds. Observed adverse effects included ptosis of the lip, dysarthria, and decreased oral sphincter function. These adverse effects were expected, clinically mild, and transient.

Patients seeking optimal healing of a traumatic oriatrogenic facial wound are concerned about the eventual appearance of the resulting scar. These patients typically understand well that effective immobilization of a healing wound will transiently compromise muscular activity of surrounding anatomic areas. It has been our experience that these patients are very accepting of the expected temporary functional deficits. We have actually noted that these patients frequently request aggressive immobilization and are willing to trade the transient functional deficits for a potentially better eventual appearance of the resulting scar.

Based on our experience and the cases presented herein, we recommend Botox-induced chemoimmobilization of wounds and lacerations located in the lower face in selected patients. The injecting surgeon should be experienced with Botox injections and should be able to predict the degree of denervation induced with the injection. Reconstituting Botox in a solution of lidocaine with epinephrine is a useful method that allows the surgeon to better predict the delayed paralysis ensuing from Botox. This method allows more exact titration of the amount of toxin required for the desired treatment effect. We have found this especially useful in the perioral region.

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Fatal Septic Thrombosis of the Superior Sagittal Sinus After Face-lift Surgery Caused by Community-Associated Methicillin-Resistant Staphylococcus aureus

A recent report by Zoumalan and Rosenberg highlighted the importance of methicillin-resistant Staphylococcus aureus (MRSA) in postoperative wound infection after rhytidectomy. In their study, MRSA was isolated in 4 of 5 patients with surgical site infections after face-lift surgery. Two of the 4 patients required hospitalization for wound care and parenteral antibiotics to cure the infection, whereas the other 2 patients with MRSA wound infections were treated with local care and oral antibiotics as outpatients. Fortunately, prompt treatment with surgical drainage and antibiotic therapy guided by susceptibility testing resulted in excellent outcomes in all patients. It stands to reason, however, that delayed recognition or inappropriate treatment of these infections may not have led to such favorable results. Herein, we report an additional case of surgical site infection following rhytidectomy caused by an epidemic community-associated (CA) strain of MRSA that unfortunately had a delayed diagnosis and tragic outcome.

Methods. In March 2008, a 53-year-old woman was admitted to the intensive care unit with fever, vomiting, obtundation, and a granulated left postauricular scalp incision 6 weeks after undergoing rhytidectomy. The patient had been given a course of cephalexin for preoperative antibiotic prophylaxis 2 weeks prior to surgery. She underwent eyebrow-lift surgery followed by rhytidectomy 5 days later. Two weeks after face-lift surgery, the patient developed swelling, erythema, and tenderness along the postauricular surgical incision extending around the left ear and down the anterior aspect of the neck (Figure 1). The wound partially separated and produced bloody drainage. After 2 additional courses of cephalexin, erythema and induration improved but were still evident anterior and posterior to the ear. The sur-
revealed a leukocyte count of 266/µL (96% segmented neutrophils), hemoglobin level more than 100 mg/L. Cerebrospinal fluid (CSF) examination showed nuchal rigidity, a pressure rate of 84 mm/h; and C-reactive protein level higher than expected. Laboratory studies revealed that her white blood cell (WBC) count was 13 100/µL; erythrocyte sedimentation rate, 20 mm/h; and a glucose level within reference range. (To convert WBC count to times 10^9 per liter, multiply by 0.001; to convert C-reactive protein to nanomoles per liter, multiply by 9.524; to convert lactate to millimoles per liter, multiply by 0.111.) Magnetic resonance imaging and venography of the patient’s head demonstrated thrombosis of the anterior and mid-superior sagittal sinus, multiple venous infarcts, prominent leptomeningeal enhancement, and a left subdural fluid collection (Figure 2).

Blood cultures taken at the time of admission yielded MRSA, and therapy was adjusted to vancomycin, rifampicin, and heparin sodium. Vancomycin trough concentrations were maintained at 20 to 25 µg/mL. The patient underwent emergency decompressive bifrontal craniectomy with debridement of epidural and subdural intracerebral empyemas. Purulent fluid was also evacuated from the subgaleal space. Cultures of the CSF, dura, skull, and thrombosed sagittal sinus all yielded MRSA. Unfortunately, the patient remained neurologically devastated despite decompressive surgery, and follow-up imaging showed the development of frontal lobe intraparenchymal abscesses, multiple septic pulmonary emboli, and evolving bitemporal strokes. The family decided to focus her care on comfort measures only, and she died on hospital day 23. Autopsy findings confirmed bilateral frontal lobe infarctions and abscesses, extensive meningitis, superior sagittal sinus thrombosis, and diffuse bronchopneumonia with abscess formation.

Results. The *S aureus* isolates obtained from blood, lung, and central nervous system (skull, subdural, and thrombosed superior sagittal sinus) cultures had identical antibiotic susceptibility profiles as follows:

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Sensitive</th>
<th>Intermediate</th>
<th>Resistant</th>
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<tr>
<td>Clindamycin</td>
<td>Tetacycline</td>
<td>Trimethoprim-sulfamethoxazole</td>
<td>Gentamicin sulfate</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>Trimethoprim-sulfamethoxazole</td>
<td>Rifampicin</td>
<td>Vancomycin</td>
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<tr>
<td>Gentamicin sulfate</td>
<td>Rifampicin</td>
<td>Daptomycin</td>
<td>Linezolid</td>
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<tr>
<td>Rifampicin</td>
<td>Erythromycin</td>
<td>Vancomycin</td>
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<td>Erythromycin</td>
<td>Vancomycin</td>
<td>Daptomycin</td>
<td>Linezolid</td>
</tr>
<tr>
<td>Linezolid</td>
<td>Clindamycin</td>
<td>Gentamicin sulfate</td>
<td>Vancomycin</td>
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Molecular analysis of representative isolates was performed as previously described. Methicillin resistance was confirmed by polymerase chain reaction of the meca gene and by the PBP2a Latex Agglutination test (Oxoid, Hampshire, England). The isolates had a pulse field gel electrophoresis profile identical to the epidemic CA-MRSA clone USA300-0114. Further molecular analysis demonstrated that the isolates contained other elements characteristic of epidemic CA-MRSA USA300, including the Panton-Valentine leukocidin genes lukSF-PV and the arginine catabolic mobile element.

Comment. The past decade has witnessed the worldwide emergence and epidemic spread of CA-MRSA strains that are genotypically and phenotypically distinct from traditional hospital-associated (HA) strains. For example, a recent study found that MRSA was the most common (in 59% of cases) cause of purulent skin and soft-tissue infections in patients presenting in US emergency departments. Most isolates (97%) belonged to a...
A single CA-MRSA clonal type, termed USA300; 1 remarkably successful subtype, termed USA300-0114 (the clone identified in this case), accounted for 74% of those cases. Furthermore, CA-MRSA is increasingly found to be a cause of surgical site infections, even in patients undergoing same-day surgery. Presumably, most ambulatory surgery patients who develop CA-MRSA wound infections were asymptptomatically colonized at the time of surgery.

**Figure 2.** Brain magnetic resonance imaging studies. A, Two-dimensional time-of-flight magnetic resonance venogram (lateral view) demonstrates loss of flow signal in the anterior and mid segments of the superior sagittal sinus (arrows). B, Coronal contrast-enhanced T1-weighted image reveals a large, enhancing left curvilinear subdural empyema (arrows) and signal loss (darkening) in the superior sagittal sinus (arrowhead), consistent the presence of sinus thrombus. C, Axial contrast-enhanced T1-weighted image demonstrates extensive left frontotemporal skin and subcutaneous soft-tissue swelling with abnormal enhancement. D, Axial T2-weighted image demonstrates large, left greater than right cerebral venous and arterial infarctions and edema.
Although CA-MRSA is usually associated with soft-tissue infections, it can also cause highly invasive and potentially lethal infections, including necrotizing pneumonia, septic cavernous sinus thrombosis, and pyogenic brain abscess.2,4 The fulminant nature of these unusual cases has led many investigators to speculate that CA-MRSA may be more virulent than HA-MRSA.3 In fact, CA-MRSA strains have been shown to be more virulent than HA-MRSA in neutrophil survival and murine infection studies,6; however, the factors that may make CA-MRSA more virulent or transmissible have not yet been clearly defined.

Herein, we present a case of surgical site infection after face-lift surgery caused by the epidemic strain of CA-MRSA USA300. At least 1 of the cases of MRSA face-lift or transmissible have not yet been clearly defined.

The emergence of MRSA as a CA pathogen will likely be an ongoing challenge in the care of ambulatory surgery patients.1,3 All MRSA wound infections should be treated aggressively with surgical drainage and appropriate antibiotic therapy.1,3 A recent study11 reporting a higher than 90% cure rate of uncomplicated CA-MRSA skin abscesses with incision and drainage combined with either a placebo or an antibiotic predicted to be ineffective (cephalexin) is yet another clear demonstration of the primacy of surgical drainage in the treatment of these infections. Less clear and in need of study are the optimal methods to identify, treat, and prevent disease in ambulatory patients at risk for MRSA surgical site infections. In conclusion, emergence of MRSA within the community represents a clear and present danger to individuals traditionally considered to be at low risk for MRSA infection, including those undergoing ambulatory surgical procedures.

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High-Volume Calcium Hydroxylapatite Filler to the Lower One-Third of the Face

Many of today’s cosmetic patients desire the maximum aesthetic result with the least amount of downtime and expense. Nonsurgical, minimally invasive cosmetic treatments are increasing at a substantial rate. Calcium hydroxylapatite (CaHA) was one of the first fillers to be used for “volumizing” the face as an alternative to surgical intervention. Filling the cheeks and prejowl sulcus lifts the cheeks and camouflage dependent jowls, creating a more youthful appearance. Surgical practices have appropriately begun to incorporate more filling and less aggressive pulling during facial procedures.

The CaHA product Radiesse (BioForm Medical Inc, San Mateo, California) is a synthetic material approved by the US Food and Drug Administration for treating facial lines and wrinkles such as nasolabial folds. Correction and patient satisfaction can be expected for about 1 year following treatment. Some reports are now espousing persistence beyond 1 year.1,3 To determine the efficacy of CaHA, we hypothesized that complete correction of the lower one-third of the face, specifically, the nasolabial folds, prejowl sulcus, oral commissure grooves, and marionette lines, by filling with CaHA would lead to an acceptable satisfaction rate at 1 year in many patients who were seeking facial rejuvenation.

Methods. This study was conducted in a private practice ambulatory facial plastic surgery center in Chicago, Illi-