30%–50% of immunosuppressed patients with coccidioidomycosis (3). Disseminated coccidioidomycosis typically involves the skin, meninges, or bone (3); however, intraocular involvement has also been described (1). A review of the literature shows 25 reported cases of intraocular coccidioidomycosis. When present, intraocular involvement is associated with serious consequences, frequently leading to eye enucleation; 1 case series described eventual enucleation in 50% of reported patients who did not die from disseminated coccidioidal infection (2).

For the patient in our report, in the setting of reported trauma and negative metastatic work-up results, it is unclear whether ocular disease resulted independently as an exogenous infection or from endogenous lymphatic and/or hematogenous spread from the patient’s lung. Diagnosis of coccidioidal endophthalmitis can be difficult, often relying on serum or nonocular tissue evaluation (4). Intraocular coccidioidal involvement usually occurs with widespread infection (5). Thus, even with apparent isolated ocular findings, evaluation for disseminated disease is warranted, including a careful history and physical examination, CT chest scan, bone scan, intracranial imaging, and lumbar puncture. Evaluation for immunosuppression, including HIV status, is warranted.

The optimal systemic antifungal therapy for intraocular coccidiodmycosis is unclear, although fluconazole is the drug of choice for extrapulmonary coccidioidomycosis, including meningitis (3). Fluconazole has good ocular penetration; however, voriconazole also achieves excellent intraocular levels (6) at lower 90% minimum inhibitory concentration levels (7). Furthermore, Gabrielian and Hariprasad (8) described an immunocompetent patient with treated and stable nonocular disseminated coccidioidomycosis who showed development of new vitritis and choroiditis 8 weeks into high-dose fluconazole therapy; his intraocular disease resolved within 2–4 weeks of transition to voriconazole.

The patient in our report received systemic voriconazole for 4 weeks plus repeated intravitreal voriconazole injections on follow-up. It is possible that this initial therapy had an effect on his positive outcome and the avoidance of eye enucleation. The optimal length of therapy is unclear; however, this patient will receive prolonged treatment (>1 year) with high-dose fluconazole, followed by a slow taper guided by serologic testing and regular ophthalmologic examination. Future research should evaluate which antifungal therapy is superior and the appropriate duration of treatment.

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References

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Human MRSA Isolates with Novel Genetic Homolog, Germany

To the Editor: Methicillin-resistant Staphylococcus aureus (MRSA) represents a major cause of hospital-, community- and livestock-acquired infections that are increasingly difficult to manage (1–3). Detection and identification of MRSA by culture and nucleic acid–based methods is challenged by heterogeneous penicillin-binding protein 2a (PBP2a) expression and variability of the staphylococcal cassette chromosome (SCCmec) elements. Recently, a new SCCmec element (XI) carried in bovine and human isolates was described (4,5). This SCCmec element contains a novel mecA homolog, designated mecA_{MRSA}^{Graz17} that is not detectable by usual mecA–specific PCR approaches and PBP2a agglutination tests. Garcia-Álvarez et al. reported this novel mecA homolog exhibited 70%
identity at DNA level to the mecA gene, and suggested these strains were transmitted from livestock to humans (4).

To search for isolates possessing the novel mecA_LGA251, we screened S. aureus databases for those entries describing oxacillin/cefoxitin-resistant phenotypes that were negative for mecA by PCR (6) or harbored S. aureus protein A gene (spa) types known to be associated with the occurrence of mecA_LGA251 (4,5). The databases of the University Hospital Münster contain S. aureus spa typing results of S. aureus isolates obtained from hospital admission screenings and specimens from patients treated at University Hospital Münster. Moreover, they include isolates derived from human and animal subjects, respectively, of 2 cross-border projects between the Netherlands and Germany: MRSA-net EUREGIO Twente/Münsterland and SafeGuard MRSA vet-net (2,7).

The presence of mecA_LGA251 was verified by using a specific PCR that applied newly designed primers: mecAL1 (5'-AGC TGG CCA TCC CTT TAT TT-3') and mecAL2 (5'-CTG GCA TAT GGA GAA GAA GAA GAA A-3'), derived from the sequence of S. aureus LGA251 provided by M. Holden (Wellcome Trust Sanger Institute, Hinxton, UK; accession no. FR821779). The sensitivities and specificities of primers were checked by applying S. aureus and other staphylococcal isolates of different clonal backgrounds (8,9). Positive PCR products were sequenced to confirm identification of mecA_LGA251; the isolates were then characterized by typing the SCCmec region with specific primers for mecR1, mecI, blaZ, ccrA, and ccrB related to type XI SCCmec as described by García-Álvarez et al. (4). Identified isolates were tested for PBP2a by using a latex agglutination assay (Oxoid Deutschland GmbH, Wesel, Germany). We used Etest (bioMérieux SA, Marcy-l’Étoile, France) for antibacterial agent susceptibility testing revealed resistance to benzylpenicillin and oxacillin/cefoxitin for all isolates.

All isolates were shown to produce β-lactamases. Apart from the general categorization of oxacillin/cefoxitin-resistant isolates as resistant to all β-lactams, the MICs of drugs for all isolates included were read as susceptible for imipenem (MIC for 90% of strains tested 0.5 μg/mL) as well as for the anti-MRSA cephalosporin ceftobiprole (MIC for 90% of strains tested 1 μg/mL applying provisional breakpoint ≤4 μg/mL). A large range of MICs were observed for classic cephalosporins, ranging from those isolates categorized as susceptible

Table. Description of mecA_LGA251-positive isolates regarding their spa type, ability to grow on selective MRSA media, PBP2a agglutination, mec gene possession, and SCCmec-type

<table>
<thead>
<tr>
<th>Isolate no. and origin</th>
<th>Year of isolation</th>
<th>Specimen</th>
<th>spa type</th>
<th>Growth on selective MRSA medium†</th>
<th>PBP2a agglutination</th>
<th>Presence of mecA</th>
<th>mecA_LGA251</th>
<th>SCCmecXI</th>
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<tbody>
<tr>
<td>Human</td>
<td></td>
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<tr>
<td>1</td>
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<td>–</td>
<td>–</td>
<td>+</td>
<td>+</td>
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<tr>
<td>2</td>
<td>2010</td>
<td>Wound</td>
<td>t843</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>3</td>
<td>2010</td>
<td>Wound</td>
<td>t843</td>
<td>+</td>
<td>–</td>
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<td>+</td>
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<tr>
<td>4</td>
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<td>–</td>
<td>–</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
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<tr>
<td>11</td>
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<td>–</td>
<td>+</td>
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<td>+</td>
<td>+</td>
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</tbody>
</table>

*spa. Staphylococcus aureus protein A; MRSA, methicillin-resistant S. aureus; PBP2a, penicillin-binding protein 2a; SCC, staphylococcal cassette chromosome: +, positive; –, negative; ND, not done.
†ChromID MRSA-Plates (bioMérieux, Marcy-l’Étoile, France).

According to the Clinical and Laboratory Standards Institute MIC interpretative standards for staphylococci (10), antibacterial agent susceptibility testing revealed resistance to benzylpenicillin and oxacillin/cefoxitin for all isolates. All isolates were shown to produce β-lactamases. Apart from the general categorization of oxacillin/cefoxitin-resistant isolates as resistant to all β-lactams, the MICs of drugs for all isolates included were read as susceptible for imipenem (MIC for 90% of strains tested 0.5 μg/mL) as well as for the anti-MRSA cephalosporin ceftobiprole (MIC for 90% of strains tested 1 μg/mL applying provisional breakpoint ≤4 μg/mL). A large range of MICs were observed for classic cephalosporins, ranging from those isolates categorized as susceptible
patterns of to detect their targets. Susceptibility compared with the MRSA reference mL, n = 1; MIC 8
af
We presume this indicates an altered methods should not be disregarded, culture-based susceptibility testing methicillin-susceptible by traditional, resistant isolates determined to be diagnostic target in molecular MRSA di
All isolates tested were susceptible (MIC 3
Tigges for excellent technical assistance. D. Kuhn, E. Leidig, M. Schulte, and M.
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