**Streptococcus suis** Infection and Malignancy in Man, Spain

To the Editor: *Streptococcus suis* is an emerging zoonotic agent. Human infection is associated with occupational exposure to swine. Affected persons are usually, but not always, healthy (1,2). Immunosuppressive conditions can predispose persons to *S. suis* infection, and cancer has classically been associated as a risk factor for *S. suis* infection (1,2). Nevertheless, the actual number of reported cases is low (2–7). We describe a severe case of *S. suis* infection, and can be an opportunistic pathogen in immunocompromised persons (1,2).

In 2012, a 57-year-old alcoholic man from Spain, who had no other medical conditions and no contact with animals sought care for headache and vomiting for 24 hours. He reported a 4-day history of fever and a pain-ful right shoulder. At admission, temperature was 38.9°C, blood pressure 180/100 mm Hg, heart rate 68 beats/min, and respiratory rate 24 breaths/min. Neck stiffness and lethargic men-tal status were noted.

Laboratory tests revealed the following values: leukocytosis of 14 × 10⁹ (reference range 3.9–10 × 10⁹) cells/L with 90.4% neutrophils, platelets 100 × 10⁹ (reference 135–333 × 10⁹) cells/L, hemoglobin 16 (reference 12.6–16.6) g/dL, creatinine 131 (reference 0–111) µmol/L, and C-reactive protein 243 (reference 0–5) mg/L. Lumbar puncture yielded turbid cerebrospinal fluid (CSF), with high opening pressure (>32 cm H₂O), pleo-cytosis (0.4 × 10⁹ leukocytes/L; 88% neutrophils), high protein level (70 [reference range 15–45] mg/dL) and a low glucose level (<0.3 [reference 2.2–4.1] mmol/L). CSF showed gram-positive cocci in chains. Cefotaxime, dexamethasone, and mannitol were administered. After septic shock and respiratory insufficiency developed, the patient was transferred to the intensive care unit.

*S. suis* spp. grew in blood and CSF cultures. Although initially misidentified as *S. bovis*, the pathogen was confirmed as *S. suis* by sequence analysis of the 16S rRNA gene. Multilocus sequence typing (http://ssuis.mlst.net) identified this isolate as sequence type (ST) 3.

The patient was transferred to the medical ward 18 days after admission. Neurologic examination demonstrated vestibular ataxia, hearing loss, and diplopia resulting from cranial nerve VI palsy. Furthermore, a diagnosis of subacromial/subdeltoid bursitis led to arthroscopic debride-ment. Ceftriaxone was administered for 4 weeks. Results of abdominal computed tomography and echocardiogram were within normal limits. Because the *Streptococcus* organism was initially identified as *S. bovis*, colonoscopy and assessment of tu-mor markers were also requested; re-sults were within normal limits.

After the patient was discharged (4 weeks after admission), diplopia and the shoulder mobility limitation completely resolved, but bilateral deafness and ataxia persisted. Five months later, the patient was readmitted for severe hypercalcemia. Positr-on-emission and computed tomog-raphy revealed liver, lung, and bone metastases. Tumor markers were elevated (carcinoembryonic antigen 4,152 [reference range 0–4.3] µg/L; monoclonal antibody CA-19–1 9,233 [0–39] U/mL). The patient died of multiorgan failure 21 days after ad-mission. Necropsy revealed a dissem-inated esophageal adenocarcinoma.

*S. suis* leads to a wide spectrum of clinical manifestations, meningitis being the most common (1,3,6–8). A higher frequency of sensorineural hearing loss is characteristic of *S. suis* meningitis (1). In the patient reported here, meningitis was complicated by permanent deafness, ataxia, and transient diplopia; to our knowledge, only 2 other cases complicated by diplopia have been reported (8,9).

*S. suis* ST3 belongs to ST clonal complex 1 and is associated with serotype 2 (http://ssuis.mlst.net). Although clonal complex 1 accounts for most *S.
suis infections in humans (1,10), genotype ST3 is extremely rare. To our knowledge, only 1 other human case of S. suis ST3 infection has been reported, also in Spain (10).

The patient reported here had severe S. suis infection with no prior exposure to swine but with undiagnosed neoplasia. In patients with no exposure to swine, we recommend searching for other predisposing factors, such as malignancy or other immunodeficiencies.

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References


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Another Dimension

Thoughtful essays, short stories, or poems on philosophical issues related to science, medical practice, and human health. Topics may include science and the human condition, the unanticipated side of epidemic investigations, or how people perceive and cope with infection and illness. This section is intended to evoke compassion for human suffering and to expand the science reader’s literary scope. Manuscripts are selected for publication as much for their content (the experiences they describe) as for their literary merit.

Table. Cases of Streptococcus suis infection and cancer reported in the literature*

<table>
<thead>
<tr>
<th>Year</th>
<th>Country of origin</th>
<th>Patient age, y/sex</th>
<th>Clinical presentation</th>
<th>Malignancy</th>
<th>Time of malignancy diagnosis†</th>
<th>Animal contact</th>
<th>Infection outcome</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>Spain</td>
<td>57/M</td>
<td>Meningitis, arthritis, bacteremia</td>
<td>Disseminated esophageal adenocarcinoma</td>
<td>5 mo after S. suis infection.</td>
<td>No</td>
<td>Survived</td>
<td>This study</td>
</tr>
<tr>
<td>2007</td>
<td>Italy</td>
<td>68/M</td>
<td>Meningitis</td>
<td>Lung squamous cell carcinoma</td>
<td>At admission</td>
<td>No</td>
<td>Survived</td>
<td>(2)</td>
</tr>
<tr>
<td>2006</td>
<td>Greece</td>
<td>59/M</td>
<td>Endocarditis</td>
<td>Colon carcinoma</td>
<td>At admission</td>
<td>Yes</td>
<td>Survived</td>
<td>(3)</td>
</tr>
<tr>
<td>2004</td>
<td>Hong Kong</td>
<td>81/F</td>
<td>Cellulitis, bacteremia</td>
<td>Breast malignancy</td>
<td>Before S. suis infection</td>
<td>Yes</td>
<td>Survived</td>
<td>(4)</td>
</tr>
<tr>
<td>2001</td>
<td>Thailand</td>
<td>NA</td>
<td>NA</td>
<td>Stomach cancer</td>
<td>Before S. suis infection</td>
<td>NA</td>
<td>NA</td>
<td>(5)</td>
</tr>
<tr>
<td>1994</td>
<td>Taiwan</td>
<td>61/M</td>
<td>Meningitis</td>
<td>Primary adrenal B-cell lymphoma</td>
<td>1 y after S. suis infection.</td>
<td>Yes</td>
<td>Survived</td>
<td>(6)</td>
</tr>
<tr>
<td>1981</td>
<td>The Netherlands</td>
<td>76/M</td>
<td>Meningitis</td>
<td>Pancreatic carcinoma</td>
<td>Before S. suis infection</td>
<td>Yes</td>
<td>Survived</td>
<td>(7)</td>
</tr>
<tr>
<td>1981</td>
<td>The Netherlands</td>
<td>52/M</td>
<td>Meningitis</td>
<td>Stomach carcinoma</td>
<td>Before S. suis infection</td>
<td>Yes</td>
<td>Survived</td>
<td>(7)</td>
</tr>
</tbody>
</table>

*Ref., reference; NA, not available.
†With regard to the episode of S. suis infection.