scan revealed anterior and posterior cerebral artery infarctions of unknown origin. Electroencephalography was performed, which detected no brain activity, and the decision was made to withdraw life support. A CSF culture performed on a specimen obtained antemortem yielded no growth of organisms.

The five doses of intraventricular quinupristin/dalfopristin and 10-day course of iv quinupristin/dalfopristin administered to the patient did eradicate VREF from the CSF after unsuccessful treatment with iv chloramphenicol for >2 months. The reason for the failure of chloramphenicol and the success of quinupristin/dalfopristin, both bacteriostatic agents, is unclear. Because there are no known reports of quinupristin/dalfopristin–associated cerebral vasospasm or thromboembolic events, we believed the patient’s cerebral infarctions could be considered only remotely related to quinupristin/dalfopristin.

The eradication of VREF after therapy with quinupristin/dalfopristin administered intraventricularly and iv to this patient is promising; however, the fatal outcome is of concern. Intraventricular administration of quinupristin/dalfopristin needs to be studied to determine its safety and the minimum dosage needed to eradicate VREF from the CSF.

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References

Epidural Abscess Due to Deep-Neck Infection

Deep-neck infections and abscesses require prompt diagnosis and treatment to prevent life-threatening complications such as airway obstruction, mediastinitis, jugular thrombophlebitis, and cavernous sinus thrombosis [1]. We describe a very rare case of deep-neck infection complicated by a cervical epidural abscess (CEA).

A 44-year-old man with a 4-day history of right-sided neck pain and fever (temperature, 38.2°C) was referred to the Department of Otolaryngology, Oulu University Hospital (Oulu, Finland). Physical examination revealed neck swelling posterior to the sternocleidomastoid muscle, and turning of the head was very painful. There were no signs of pharyngeal infection. Ultrasonographic examination of the neck revealed diffuse swelling with edema without distinct abscesses. Treatment with iv cefuroxime, 1.5 g t.i.d., was initiated. During the subsequent 48 hours, the neck swelling increased, but contrast-enhanced CT revealed only multiple, small, low-attenuation spaces deep to the sternocleidomastoid muscle, interpreted as edema.

Because of continued neck swelling, surgical exploration was undertaken 4 days after admission. This revealed a large abscess in the scalenus muscle region. Gram staining of the abscess specimen showed gram-positive cocci in groups, and a culture of the specimen later yielded Staphylococcus aureus. The antibiotic treatment was changed to parenteral clindamycin, 600 mg t.i.d., and rifampin, 450 mg b.i.d.

One day after surgery, the patient complained of fulminant headaches and upper and lower extremity pain. He also had difficulty urinating. An MRI revealed an epidural abscess extending from vertebral levels C2 to T10 (figure 1). Neurosurgical consultants determined that operative treatment was not indicated, given that there were no signs of spinal-cord compression and surgical risks included fulminant complications such as meningitis.

The patient recovered slowly. After 2 weeks, iv clindamycin was replaced by an oral regimen that was continued for another 2 weeks, whereas rifampin therapy was discontinued. Two months later, a repeated MRI did not show any signs of epidural abscess. Two and one-half years after the infection, the patient continued...
to have episodes of cervical pain, but an MRI and CT and bone scans did not show any active infection or signs of osteomyelitis.

The primary etiology of the deep-neck infection in this case remains unknown, which is not unusual [1]. The patient did not have any known predisposing factors for CEA, such as diabetes, iv drug use, recent spinal surgery, trauma, or documented metastatic spread of infection [2]. *S. aureus* is the most common causative organism in cases of CEA [3].

It has been postulated that osteomyelitis is a necessary prerequisite for CEA, but Lasker and Harter [3] also maintain that infection may spread directly into the veins of the cervical epidural space, thus creating an epidural abscess. Direct extension through the deep fascia and the foramen of the cervical column was the most probable path of the infection in our case, given that the abscess was located near the vertebral column, the epidural abscess developed fairly rapidly, and osteomyelitis was not detected on the preoperative CT scan.

Symptoms of CEA include neck stiffness and cramping, as well as radicular pain involving both the arms and the lower extremities. Weakness or paralysis of the extremities occurs 2 days to several weeks after the onset of the neck pain. Occasionally, bladder dysfunction occurs. Radicular pain and bladder dysfunction were present in our case, but motor weakness did not develop. The case we describe suggests that CEA can be managed conservatively if there is no motor weakness, a view also supported by Leys et al. [4].

**Retrosternal Abscess: A Prominent Manifestation of Infection Due to *Staphylococcus aureus***

*Staphylococcus aureus* is a frequent cause of bacteremia with resulting metastatic infections at sites distant from the primary site of infection; this primary source of infection may be minor or subclinical. Isolation of *S. aureus* from blood cultures should prompt a thorough evaluation to rule out concurrent endocarditis, osteomyelitis, or other infections. We describe a patient with a retrosternal abscess due to *S. aureus* infection.

A 43-year-old man was admitted to the hospital for evaluation of fever, chills, and retrosternal pleuritic chest pain that was relieved when he leaned forward. He reported a history of hypertension.

Physical examination revealed a temperature of 39.5°C, blood pressure of 160/100 mm Hg, pulse of 140/min, and respirations of 24/min. Auscultation disclosed a precordial friction rub, and the patient was admitted to the cardiology department. Laboratory studies revealed the following values: hematocrit, 38%; WBC count, 16 × 10⁹/L (80% neutrophils); and platelet count, 155 × 10⁹/L. Biochemical indices and the results of a urinalysis were normal. An electrocardiogram showed sinoatrial tachycardia. Findings on a chest radiograph were within normal limits, and transthoracic and transesophageal ultrasonography of the heart revealed no abnormalities. The next day the patient complained of vague abdominal pain; he was febrile (temperature, 40°C) and was perspiring profusely. He had mild diffuse abdominal tenderness, but neither rebound tenderness nor guarding was present. Abdominal ultrasonography was negative.

The patient was referred to the internal medicine department. His temperature was 39.8°C; blood pressure, 110/60 mm Hg; pulse, 115/min; and respirations, 20/min. A meticulous physical examination disclosed a small, well-demarcated, healing erysipelas-like lesion on the lower half of the shin, mildly tender to palpation. Cultures of a swab of the lesion were negative. The patient provided a history of a minor trauma that had occurred while gardening 1 week before admission. Leukocytosis persisted. The C-reactive protein level was 252 mg/dL, and serology for rheumatoid factor was negative. Blood cultures (seven samples) were positive for methicillin-susceptible *S. aureus*, and the patient started receiving iv vancomycin, 500 mg q.i.d., and rifampin, 300 mg po b.i.d., because the MIC for semisynthetic anti-staphylococcal penicillins was relatively high. However, the patient’s substernal discomfort continued. A thoracic CT scan revealed a retrosternal mass lesion, extending from the level of the aortic arch to the level of the ascending aorta, with no bony involvement (figure 1A). CT-guided drainage was unsuccessful; the patient refused surgery. The fever abated after 7 days, and he became afebrile on the 12th day of treatment. A repeated thoracic CT scan showed significant reduction in the size of the mediastinal mass lesion (figure 1B). Rifampin therapy was continued for 15 days overall.

On the 20th day of therapy, the patient was febrile (temperature, 38°C). Laboratory studies revealed the following values: hematocrit, 31%; WBCs, 2.6 × 10⁹/L; and platelets, 394 × 10⁹/L. Evaluation of a peripheral blood smear revealed 1% neutrophils (0.26 × 10⁹/L), 45% lymphocytes, 45% monocytes, 1% basophils, and 2% metamyelocytes. Evaluation of a bone-marrow aspirate revealed a hypercellular marrow and the myeloid-to-erythroid-line ratio was 1.2:1. Blood cultures were negative. Treatment with vancomycin was discontinued, and that with iv dicloxacillin, 2 g q.i.d., was instituted. Three days later the patient was afebrile, and his WBC count was 10.5 × 10⁹/L (78% neutrophils). The anti-staphylococcal therapy was continued for 6 weeks. Seven weeks after dis-

**References**


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