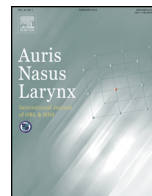




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## A case of multiple empyema caused by *Streptococcus intermedius*

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### ABSTRACT

We report the case of a patient with multiple empyema present throughout his body, including chronic sinusitis and chronic suppurative otitis media, as well as subsequent epidural empyema, all caused by *Streptococcus intermedius*. A 38-year-old man presented with chief complaints of headache, left ear discharge, and nasal congestion. Imaging studies revealed pansinusitis, soft tissue signs in the mastoid cells, and otitis media. The patient was treated with meropenem hydrate, 6 g/day. While clinical findings indicated improvement of the sinusitis, his headache did not improve. Further examination with contrast computerized tomography (CT) ‘a chest radiography’ blood cultures were performed, and the patient was diagnosed with multiple empyema (with an epidural empyema, pulmonary suppuration) caused by *S. intermedius*. Subsequent burr hole drainage was implemented to drain the epidural empyema. Long-term administration was required to treat pulmonary suppuration. While they remain rare, there has been a recent upward trend in the frequency of cases in which a young, previously healthy patient has developed multiple empyema throughout their body despite the absence of complicating diseases that pose an immune deficiency risk, such as diabetes or infection with the human immunodeficiency virus (HIV). In order to properly diagnose and treat patients presenting with multiple empyema infection with *S. intermedius* should be included in the differential diagnosis.

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## 1. Introduction

*Streptococcus intermedius* is one of three members of the *Streptococcus anginosus milleri* group and was first reported in 1956 by Guthof [1], who isolated it from oral cavity empyema. This group of bacteria was named after the microbiologist W. D. Miller. *S. intermedius* forms the normal flora of the intestinal tract and oral cavity but can also be a relatively common causative agent of empyema formation, including empyema in the lung and the brain. We report the case of a patient who

developed empyema throughout their body, including chronic sinusitis and chronic suppurative otitis media, as well as subsequent epidural empyema caused by *S. intermedius*.

## 2. Case report

A previously healthy 38-year-old man had been exhibiting headaches, left ear discharge, and nasal congestion since September 2014. When his symptoms did not improve over a 2-month period, he sought treatment at a clinic. He was diagnosed with left suppurative otitis media, a left nasal cavity neoplasm, and chronic sinusitis. Following treatment with clarithromycin and carbocysteine, he showed no improvement

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**Fig. 1.** Area of low attenuation in the left maxillary sinus, left ethmoidal sinus, and left frontal sinus.



**Fig. 3.** Signs of infiltration present in both lower lung fields.

and was subsequently referred to our hospital for examination and treatment. His left nasal cavity showed a polypoid mass, and a diagnostic biopsy revealed no clearly evident malignant findings. Upon admission, blood tests were significant for an elevated white blood count at 25,900/ $\mu$ l and an elevated C-reactive protein (CRP) at 26.5 mg/dL. Paranasal sinus CT showed pansinusitis, soft tissue signs within the mastoid cells, and otitis media (Figs. 1 and 2). Because the patient was exhibiting headaches and a severe fever, the possibility of meningitis or other intracranial complication was considered. Therefore, upon consultation with the Department of Neurology, he underwent a lumbar puncture and magnetic resonance imaging of the head. These studies yielded no clear etiology for his headaches. Based on the preliminary assessment that chronic sinusitis was causing the patient’s fever and headaches, he was admitted to the hospital for the purposes of further examination and treatment. Chest X-rays taken at the time of admission showed signs of infiltration in both lung fields and suggested bacterial pneumonia as an additional complication (Fig. 3).

*Laboratory findings upon admission:* WBC 25,900/ $\mu$ l, CRP 26.5 mg/dl.

### 2.1. Clinical course

After admission, the patient was started on meropenem hydrate, 6 g/day, and received ofloxacin ear drops and irrigation for his left ear. Findings of pansinusitis were absent on a CT scan performed on hospital day 7, and his course was thought to be favorable. However, he continued to complain of a heavy-headed sensation, and when a head CT was performed, a convex lens-shaped area of low attenuation accompanied by a ring of enhancement was present in the left posterior cranial fossa (Fig. 4). Blood cultures grew *S. intermedius*, but cultures from the nasal discharge and the ear discharge were negative. Chest X-rays showed no improvement, so in consultation with the Department of Respiratory Medicine, he was diagnosed with pulmonary suppuration. Considering chronic suppurative otitis



**Fig. 2.** Soft tissue signs in the left mastoid cells.

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