



<http://dx.doi.org/10.1016/j.jemermed.2016.09.011>

## **Selected Topics: Neurological Emergencies**

### **A RARE CENTRAL NERVOUS SYSTEM FUNGAL INFECTION RESULTING FROM BROWN HEROIN USE**

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**Abstract—Background:** Fungal nervous system infection can be a difficult diagnosis to make, due to the fact that there are no specific manifestations of the disease and laboratory confirmation is difficult to confirm. **Case Report:** We report a young male who presented to our emergency department with a variety of unilateral visual field complaints. While he initially denied recent IV drug abuse, his physical examination was highly suggestive of a fungal infection known to result from brown heroin use. He was ultimately diagnosed with meningitis, ventriculitis, and endogenous endophthalmitis believed to result from a *Candida* species. The response to treatment with vitrectomy and broad-spectrum antimicrobials gave support to the presumed diagnosis. **Why Should an Emergency Physician Be Aware of This?:** We provide a rarely described report of a possible complication from the use of IV brown heroin that led to a central nervous system infection involving vision loss by fungal infection. © 2016 Elsevier Inc. All rights reserved.

**Keywords—**ventriculitis; meningitis; candida; endophthalmitis; brown heroin

#### **INTRODUCTION**

*Candida* endophthalmitis and meningitis due to brown heroin use has been described in ophthalmology and neurology literature in the 1980s and 1990s, but has never been described in emergency medicine literature. We

report a presumed case of candida endophthalmitis, ventriculitis, and meningitis due to brown heroin use. The patient's presentation to the emergency department (ED) was associated with cerebrospinal fluid (CSF) aberrations in a patient with significant ocular symptoms, but an otherwise unremarkable physical examination.

#### *Case Report*

A 23-year-old male with a medical history of asthma and prior IV recreational drug use presented to the ED complaining of 1 month of unremitting, band-like headache with visual disturbances. The described visual disturbances manifested themselves initially as intermittent, "black dots" and vague blurriness of his left visual field. Shortly before presentation, he described total left monocular vision loss, which prompted him to seek medical evaluation.

The patient sought care from his primary ophthalmologist, who diagnosed left-eye vitritis and initiated an outpatient uveitis work-up that included laboratory analysis and brain magnetic resonance imaging. During the following days, his symptoms of headache and visual complaints worsened. Shortly after ophthalmologic evaluation, he elected to seek further evaluation of his complaints in our ED.

During the interview, the patient provided the history mentioned. He denied recent recreational drug use, including IV drugs of abuse. His physical examination

RECEIVED: 13 June 2016; FINAL SUBMISSION RECEIVED: 30 August 2016;

ACCEPTED: 5 September 2016

showed him to be afebrile and not appearing critically ill. Vital signs at the time of ED evaluation were blood pressure of 132/75 mm Hg, temperature of 35.9°C, heart rate of 98 beats/min, respiratory rate of 20 breaths/min, and oxygen saturation of 99% on room air. His eye examination was remarkable for mild injection of the left sclera and visual acuity was decreased in the left eye (OD 20/30, OS 20/100). Of note, the left eye had a relative afferent pupillary defect assessed by a swinging light test. His neck was supple and without nuchal rigidity; he was oriented to person, place, and time; and his remaining cranial nerves were intact. He did demonstrate ataxia with finger-to-nose testing on his left side. Strength was symmetric and 5/5 in all extremities; reflexes were 2+ in all extremities. Auscultation of the heart noted a regular rate without murmur or friction rub. The remaining examination, including ears, heart, lungs, abdomen, and extremities were unremarkable.

Our differential diagnosis was broad and included subacute meningitis, uveitis, and complex migraine. The initial diagnostics performed included a complete blood count revealing a leukocytosis of 13.42 K/uL with a predominance of segmented neutrophils. Electrolytes and renal function were within normal limits. Erythrocyte sedimentation rate was 12 mm/h. Human immunodeficiency virus (HIV) testing was considered at this time but was deferred in the ED, as the patient noted a recent HIV test was negative. A lumbar puncture for CSF analysis was performed due to concerns of an infectious etiology. The results of the CSF analysis were: white blood cells of 7,775/mm<sup>3</sup>, 53% neutrophils, red blood cells 1,150/mm<sup>3</sup> without xanthochromia, glucose of 9 mg/dL, and protein of 295 mg/dL. A Gram stain of the fluid demonstrated many polymorphonuclear leukocytes without organisms present. After reviewing these data, our clinical impression was subacute meningitis, and empiric broad-spectrum antimicrobial therapy was initiated with ceftriaxone, vancomycin, and prednisone.

To further evaluate the patient's visual deficits, ophthalmology was consulted. The consultant's fundoscopic examination identified the appearance of cotton balls in a string of pearls configuration, suggestive of possible candida endophthalmitis (Figure 1). In order to exclude central nervous system (CNS) macro- and micro-abscesses, brain magnetic resonance imaging (MRI) with and without contrast was performed emergently. The MRI revealed diffuse enhancement of the margins of the lateral, third, and fourth ventricles (Figure 2) consistent with ventriculitis. The ophthalmologist's impression of this patient's condition was intermediate uveitis. The decision was made to perform a vitrectomy, which was completed uneventfully within 1 day of initial ophthalmology consultation. Vitreal fluid was collected and sent for analysis. While in the operating room, the patient received an injection of amphotericin and systemic antimicrobial therapy was amended to amphotericin B, vancomycin, and ceftazidime. The Gram stain of his vitreal fluid demonstrated no organisms. Later, the final vitreal fluid analysis, including the culture, fungal, and acid-fast bacilli smears, were without organism growth.

During the patient's hospital course, he was re-interviewed, focusing on his IV drug use. At that time, he affirmed that he had recently injected IV brown heroin several times shortly before his symptoms began.

After a brief inpatient hospitalization, the patient was discharged and completed 2 weeks of voriconazole. Outpatient follow-up several months later found the patient's vision had returned to his pre-morbid state. He further reported that although his headaches were significantly improved, he did have intermittent episodes of mild discomfort rather than constant and unremitting pain.

While cultures and smears failed to identify a fungal etiology, that is, *Candida albicans*, the clinical findings and his recovery are supportive to the patient's final diagnosis of candida meningitis, ventriculitis, uveitis, and endophthalmitis.

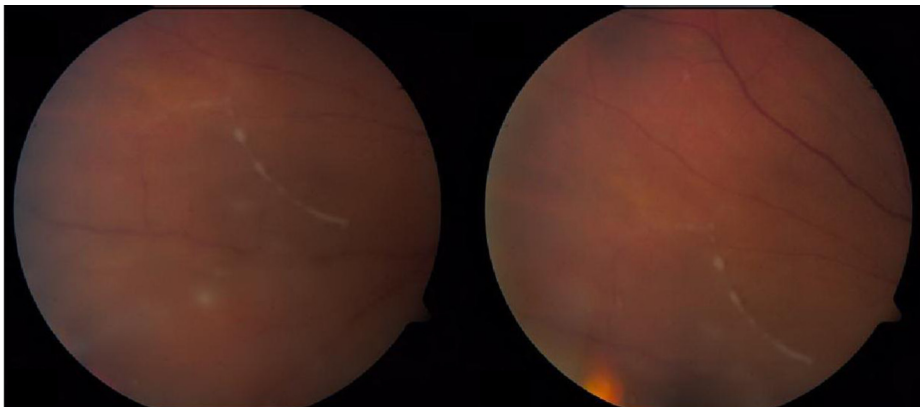


Figure 1. Fundoscopic imaging showing cotton balls in a string of pearls configuration.

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