



Pediatric Cavernous Sinus Thrombosis Complicating Sinusitis: A Case Report

Jessica Sop DO and Alfred Tager*

Department of Emergency Medicine, Charleston Area Medical Center Health Education and Research Institute, USA

Abstract

Background: Cavernous sinus thrombosis is a rare neurologic disease. Pediatric patients with swollen, painful eyes accompanied by headache should prompt thorough investigation by the emergency physician.

Case Report: We report a case of a 13-year-old who complained of a headache and eye swelling and pain after being diagnosed with ethmoid and sphenoid sinusitis whose radiographic investigation revealed a cavernous sinus thrombosis. This case study reviews the epidemiology, alarming physical exam findings, necessary diagnostics and treatment of this once universally fatal disease.

Keywords: Cavernous sinus thrombosis; Sinusitis; Pediatrics; Emergency Medicine

Introduction

Cavernous sinus thrombosis is a rare neurologic disease. The overall incidence of cerebral venous thrombosis in adults is estimated to be 1.3 to 1.6 per 100,000 people [1,2]. The Canadian Pediatric Ischemic Stroke Registry reported the incidence among children to be 0.67 cases per 100,000 children per year [3]. Furthermore, results of the International Study on Cerebral Vein and Dural Sinus Thrombosis indicated that thromboses are found in the cavernous sinus in only 1.3% of cases, making it the most uncommon location for a thrombosis in the cerebral venous system [4].

Case Presentation

A 13-year-old female presented to the emergency department with the chief complaint of left eye pain and swelling. The patient reported a migratory headache which began 2 weeks prior. She had been seen and evaluated for it in the emergency department 2 days prior to our evaluation. At that time, the patient's mother reported that she had been diagnosed with sinusitis a month before and had resolution of her symptoms without treatment. After a week of being pain free, the patient's headache returned. A CAT scan of her head was performed and she was diagnosed with acute ethmoidal and sphenoidal sinusitis. The patient was placed on amoxicillin-clavulanate and discharged. Two days later, at the time of our evaluation, the patient reported continued headache, left eye swelling, pain with extra-ocular movement and fever up to 102° F. The patient had no significant past medical history and was not taking any medications other than the antibiotic prescribed to her two days prior. Upon evaluation, her vital signs were normal. On physical exam, she had left periorbital edema and mild proptosis with tenderness to palpation around the orbit. There was no erythema or induration about the orbit. Her pupils were equal and reactive to light and she did not have conjunctival injection. She had pain with extra-ocular movement, but no restriction of movement. The remainder of her physical exam was normal. Laboratory studies included a complete blood count, coagulation panel, basic metabolic panel and pregnancy test. The patient had a white blood cell count of 16,000/MCL, otherwise all other laboratory studies were unremarkable. CAT scan of the orbits with contrast revealed opacification of the posterior ethmoid and sphenoid sinuses, left orbital cellulitis and orbital vein phlebitis suspicious for cavernous sinus thrombosis (Figure 1 a, 1b).

The patient was placed on ceftriaxone and vancomycin. Hematology was consulted and the patient was also given low-molecular weight heparin. While she was hospitalized, the patient underwent bilateral total ethmoidectomy and sphenoidotomy. She continued antibiotics and anticoagulation after discharge. Upon follow up with the ophthalmologist and otolaryngologist, she had no residual symptoms.

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*Correspondence:

Alfred Tager, Department of Emergency Medicine, Charleston Area Medical Center Health Education and Research Institute, 3211 MacCorkle Avenue S.E. Charleston, WV, 25304, USA, Tel: 15202218224;

E-mail: alfred.tager@gmail.com

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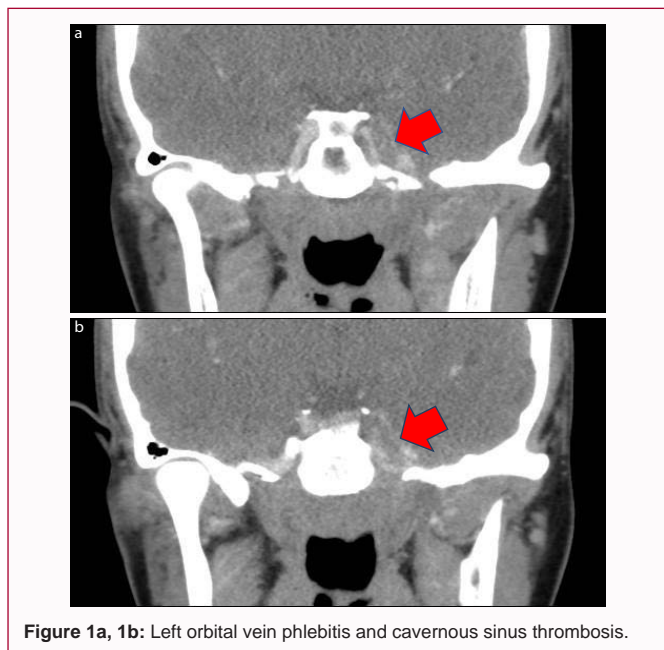


Figure 1a, 1b: Left orbital vein phlebitis and cavernous sinus thrombosis.

Discussion

Cavernous sinus thrombosis can arise from septic and aseptic conditions; however the most common cause identified is acute sinusitis, specifically sphenoid and ethmoid sinusitis [5-8]. *Staphylococcus aureus* is responsible for approximately 70% of all infections leading to cavernous sinus thrombosis, followed by *Streptococcus species* which account for around 20%. Classically, patients present with unilateral periorbital edema, proptosis and headache. They may also have signs related to the compression of cranial nerves III, IV, VI, V1 and V2 which traverse the cavernous sinus, the most common of which is sixth cranial nerve paresis [6,9].

In the early pre-antibiotic era, cavernous sinus thrombosis was thought to be universally fatal. A review of 878 cases was first reported in 1961 revealing it had an estimated mortality of 80% and morbidity of 75%. This declined to a mortality of 13% and morbidity of 22% later reported in 1977 [10]. Better outcomes over time can also be attributed to the prompt recognition of the signs and symptoms and accurate diagnosis of the disease using contrast-enhanced CT or MRI, which allows for more expeditious treatment. Antibiotics are clearly indicated in the treatment of cavernous sinus thrombosis. Evidence supporting the use of anticoagulation has been based almost entirely on retrospective literature reviews of adult cases, and conclusions have been variable, with some studies showing improved morbidity without significant impact on mortality and others illustrating benefit with regard to mortality but not morbidity [11,12]. However, despite aggressive intervention, cavernous sinus thrombosis related pediatric morbidity is estimated to be from 25% to as high as 55%, with mortality at 8% based on case series and extensive literature case review [13,14].

Why should an emergency physician be aware of this?

Cavernous sinus thrombosis is a rare disease most commonly caused by sinusitis. Although morbidity and mortality has improved over the years, patients are still at risk for permanent neurologic deficits and even death. Clinical suspicion must remain high when a patient presents with signs and symptoms of the disorder so that prompt diagnosis can be made and appropriate treatment can be implemented.

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