CASE REPORT

Superior Ophthalmic Vein Thrombosis as a Presentation of Methicillin-Resistant *Staphylococcus aureus* Infection in a 23-Year-Old Male: A Case Report

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ABSTRACT

Superior ophthalmic vein thrombosis (SOVT) is a rare but potentially life-threatening condition associated with significant risk of vision loss. It may arise from infectious or inflammatory orbital diseases, trauma, neoplasms, or hypercoagulable states, with *Staphylococcus aureus* being a common pathogen in orbital cellulitis. We report the case of a 23-year-old male who presented with periorbital swelling, upper lip edema, and pustular lesions. During evaluation in the emergency department, he developed sudden-onset horizontal diplopia and left eye esotropia. Magnetic resonance imaging (MRI) of the brain revealed thrombosis of the left superior ophthalmic vein. Empiric therapy with ceftriaxone, vancomycin, metronidazole, and enoxaparin was initiated. Wound and blood cultures later demonstrated heavy growth of methicillin-resistant *Staphylococcus aureus* (MRSA), prompting adjustment of antimicrobial therapy to meropenem and vancomycin. The patient subsequently improved and was discharged in stable condition. This case highlights the aggressive nature of MRSA infection and its potential to rapidly progress to orbital and intracranial complications such as SOVT. Early diagnosis, prompt imaging, targeted antimicrobial therapy, and timely intervention are essential to preserve vision and improve clinical outcomes.

Keywords: Methicillin-resistant Staphylococcus aureus, superior ophthalmic vein thrombosis, case report

INTRODUCTION

Superior ophthalmic vein thrombosis (SOVT) is a rare but serious condition, with an estimated incidence of 3–4 cases per million per year, carrying the potential for significant morbidity and mortality.[1] No specific local incidence data are available for SOVT. Superior ophthalmic vein thrombosis (SOVT) is primarily caused by orbital infections involving aerobic or anaerobic organisms, with *Staphylococcus aureus* and *Streptococcus* species being the most identified pathogens in cases of orbital cellulitis.[2]

SOVT manifests clinically due to orbital congestion resulting from impaired venous drainage. Common symptoms include pain, chemosis, eyelid swelling, proptosis, restricted eye movement, and sometimes fundus abnormalities, along with reduced visual acuity. In the study of van der Poel et al. al, most cases of SOVT were unilateral.[3] Diagnosis is usually confirmed through post-contrast imaging modalities, such as computed tomography (CT) or magnetic resonance imaging (MRI).[4] Given its close relationship with orbital cellulitis, SOVT should be suspected when physical examination findings suggest optic nerve or orbital involvement. Reported complications include permanent vision loss and, in severe cases, mortality.[2]

This case is unique in that it describes an isolated SOVT without radiologic evidence of cavernous sinus involvement, occurring in the setting of orbital infection, and highlights the diagnostic and therapeutic challenges associated with early recognition of this uncommon entity. Furthermore, this report adds to the limited body of literature on isolated SOVT by emphasizing the role of prompt imaging, multidisciplinary management, and the consideration of anticoagulation in preventing progression to cavernous sinus thrombosis and irreversible visual loss.

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CASE PRESENTATION

A 23-year-old male presented with a 5-day history of persistent upper lip edema. Over the course of the following days, the swelling progressed, and pustules with discharge developed. Three days later, the patient noticed periorbital swelling in his left eye. He denied any history of trauma. His medical history was unremarkable for diabetes, hypertension, asthma, or hematologic disorders. He reported smoking for 3 pack-years, occasional alcohol consumption, and denied any history of sexually transmitted infections or illicit drug use.

On admission, the patient was tachycardic, tachypneic, and febrile. Examination revealed a swollen upper lip with multiple 2-3 mm pustules containing yellowish fluid, crusting, and dry lips with involvement of the oral mucosa (Figure 1). On Hospital Day 2, approximately 24 hours after the onset of lip involvement, the patient developed a sudden onset of horizontal diplopia accompanied by left eye esotropia. There was no proptosis and no ptosis noted. Extraocular movements were full, and there was no measurable deviation in millimeters on exam. Both pupils were reactive to light, and visual acuity and color vision remained normal. Based on the presence of esotropia with horizontal diplopia, the most likely muscle involved was the lateral rectus, suggesting a possible left abducens (CN VI) involvement, despite initially full extraocular movements.

The complete blood count revealed leukocytosis with a neutrophilic predominance, and procalcitonin was elevated at 6.91 ng/mL (normal: <0.05 ng/ml). The patient was initiated on empiric antibiotic therapy with ceftriaxone 2g IV every 12 hours and metronidazole 500mg IV every 6 hours. Tetanus toxoid vaccination was also administered. Magnetic resonance imaging (MRI) of the brain with contrast demonstrated thrombosis of the left superior ophthalmic vein, with no evidence of cavernous sinus thrombosis (Figure 2).

Cerebrospinal fluid (CSF) analysis revealed a slightly cloudy, xanthochromic appearance, with 0-2 red blood cells (RBCs)/mm^3 and 575 white blood cells (WBCs)/mm^3. The CSF glucose level was low at 20 mg/dL (45-75 mg/dL), and total protein was elevated at 103.9 mg/dL (15-45 mg/dL). The Cryptococcal Antigen Latex Agglutination test was negative. Both tuberculosis Gene Xpert and aerobic cultures yielded negative results, and rapid HIV testing was also negative.

Anticoagulation therapy was initiated with enoxaparin 0.4 cc subcutaneously every 12 hours. Wound and blood cultures identified heavy growth of a methicillin-resistant *Staphylococcus aureus* (MRSA) strain with the mecA gene. As a result, Metronidazole was discontinued. Ceftriaxone was switched to Meropenem 2 grams IV every 8 hours, and Vancomycin 1.5 grams IV every 8 hours was added to the regimen. Meropenem was administered for a total of 14 days.

Repeat blood cultures and sensitivities taken from two sites on day 18 of Vancomycin therapy were negative. No repeat brain MRI was performed; all assessments were based solely on clinical evaluation. The patient remained afebrile and demonstrated steady improvement in his ocular findings. Vancomycin was continued for a total of 28 days. By the time of discharge, the esotropia had fully resolved, with normal extraocular movements, no diplopia, and no visual deficits.

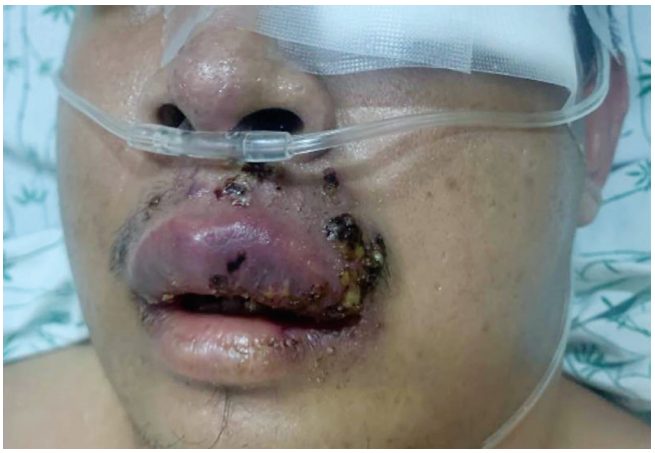

Figure 1. . Upper lip swelling with pustules.

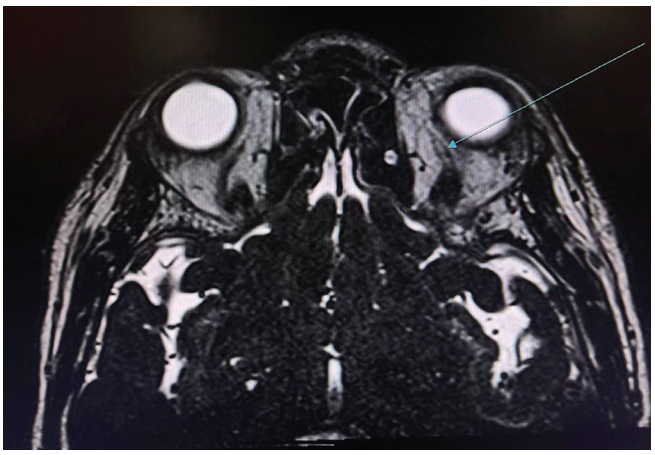

Figure 2. MRI Brain with contrast - Axial thin slices - T2. Pointed area: loss of the signal flow void of the left superior ophthalmic vein likely due to thrombosis.

DISCUSSION

Superior ophthalmic vein thrombosis (SOVT) is a rare yet critical condition that requires prompt medical intervention. Delayed treatment can lead to permanent vision loss and potentially life-threatening complications. In the present case, the patient initially presented with upper lip edema and swelling, followed by the development of horizontal diplopia and esotropia in the left eye. Magnetic resonance imaging (MRI) of the brain with contrast revealed thrombosis of the left superior ophthalmic vein.

Due to the absence of valves in both the superior ophthalmic and facial veins, even a seemingly benign superficial infection within the "danger triangle" of the face can

spread retrograde, potentially reaching the cavernous sinus.[1] SOVT is characterized by its distinct involvement of the optic nerve and orbit. Impaired visual acuity, altered color perception, and abnormal pupillary light reflex may indicate optic neuropathy. Additionally, pain or paralysis during eye movements, proptosis, or diplopia may suggest inflammation of the extraocular muscles, pointing to orbital involvement.[5]

SOVT can result from a variety of underlying causes, including infectious conditions such as paranasal sinusitis, orbital cellulitis, and septic cavernous sinus thrombosis, which can extend into the superior ophthalmic vein (SOV). Aseptic factors, such as spontaneous or treated thrombosed carotid cavernous fistulas (CCF) and neoplastic invasion, can also contribute to the development of SOVT.[6] In this case, based on the clinical presentation and progression of symptoms, the primary source of infection was the upper lip, where multiple pustules and mucocutaneous involvement were initially observed.

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The role of anticoagulation in the management of isolated SOVT has not been established through randomized clinical trials. Existing literature primarily discusses anti-coagulation as a preventive measure against the extension of thrombosis into the cavernous sinus or once cavernous sinus thrombosis has already occurred.[7] A study by Weerasinghe et al. found that anticoagulation is associated with reduced mortality in patients with cavernous sinus thrombosis.[5] In this case, enoxaparin, a low molecular weight heparin, was used off-label for SOVT to reduce the risk of thrombus extension and associated complications.

CONCLUSION

Superior ophthalmic vein thrombosis (SOVT) is a rare but critical medical emergency, often presenting as a complication of MRSA infection. Early detection and prompt treatment, supported by a thorough and focused history and physical examination, are essential to prevent progression and mitigate potential adverse outcomes. The prognosis of SOVT largely depends on the underlying cause. Although most cases of SOVT resolve without significant complications, it is important to recognize that in some instances, permanent visual acuity loss may occur. Timely initiation of appropriate antibiotic therapy and surgical intervention can lead to a favorable visual prognosis.

Ethical Considerations

Written informed consent was obtained from the patient for participation and for the publication of this case report, including the accompanying images and data.

Statement of Authorship

Both authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

Both authors declared no conflicts of interest.

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REFERENCES

1. Holmes N, Tong S, Davis J, Hal S. Treatment of methicillin-resistant Staphylococcus aureus: vancomycin and beyond. Semin Respir Crit Care Med. 2015;36(1):17-30. doi: 10.1055/s-0034-1397040.
2. Chen L, Guo US, Grutman G, McFarlane SI, Mehta P. Superior ophthalmic vein thrombosis induced by orbital cellulitis: an ophthalmic emergency. Cureus. 2021. doi: 10.7759/cureus.19038.
3. van der Poel NA, de Witt KD, van den Berg R, de Win MM, Mourits MP. Impact of superior ophthalmic vein thrombosis: a case series and literature review. Orbit. 2019;38(3):226-32. doi: 10.1080/01676830.2018.1497068.
4. Mishima M, Yumoto T, Hashimoto H, Yasuhara T, Iida A, Tsukahara K, et al. Superior ophthalmic vein thrombosis associated with severe facial trauma: a case report. J Med Case Rep. 2015 Oct;9:244. doi: 10.1186/s13256-015-0737-y. PMID: 26514430; PMCID: PMC4627619.
5. Weerasinghe D, Lueck CJ. Septic cavernous sinus thrombosis: case report and review of the literature. Neuroophthalmology. 2016;40(6):263-76. doi: 10.1080/01658107.2016.1230138.
6. Desa V, Green R. Cavernous sinus thrombosis: current therapy. J Oral Maxillofac Surg. 2012;70(9):2085-91. doi: 10.1016/j.joms.2011.09.048.
7. Sotoudeh H, Shafaat O, Aboueldahab N, Vaphiades M, Sotoudeh E, Bernstock J. Superior ophthalmic vein thrombosis: What radiologist and clinician must know? Eur J Radiol Open. 2019;6:258-64. doi: 10.1016/j.ejro.2019.07.002.