

Varicella zoster causing preseptal cellulitis – uncommon but possible

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Abstract

Background: Varicella has been known to be a harmless childhood disease. However, it has been reported that severe complications have taken place following Varicella infection, in both immunocompetent, as well as immunocompromised, individuals. Cutaneous complications of Varicella may manifest as preseptal cellulitis, albeit rarely.

Report: We present a case of a 4-year-old boy who presented with symptoms and signs of preseptal cellulitis following Varicella infection. He was referred to the otorhinolaryngology team for a nasoendoscopy to rule out sinusitis, in view of the fear that a child presenting with a swollen red eye may be a case of true orbital cellulitis. He was treated successfully with intravenous antibiotics and surgical drainage of the preseptal collection.

Conclusion: It is imperative for clinicians to be aware that a simple Varicella infection may lead to cutaneous complications in the pediatric age group, especially in children who are 4 years and younger. They may develop preseptal cellulitis, whose presentation might mimic that of orbital cellulitis. Empirical treatment with antibiotics would be advantageous for the patient. A nasoendoscopic examination may also be warranted in these cases to rule out sinusitis as a cause of orbital cellulitis.

Introduction

Preseptal cellulitis is principally a pediatric problem, most commonly caused by trauma, insect bites, or the spread of a systemic infection. It is rarely caused by sinusitis. On the other hand, orbital cellulitis is usually caused by the spreading of infection from the sinuses.¹ However, it can be very difficult to differentiate between preseptal and orbital cellulitis. In both conditions, the eyelids appear erythematous and swollen, but in patients with preseptal cellulitis the eye movement is normal, whereas, in orbital cellulitis, there will be ophthalmoplegia and proptosis. Patients with orbital cellulitis may complain of blurring of vision and have abnormal pupil reactions, which is not usually seen in preseptal cellulitis. Preseptal cellulitis infection is confined to the eyelid skin, unlike orbital cellulitis, in which the infection extends beyond the orbital septum into the orbit.

The most common organisms isolated in cases of preseptal cellulitis are the *Staphylococcus* and *Streptococcus* species. Very rarely, preseptal or orbital cellulitis is associated with Varicella zoster virus (VZV) infection, and, usually, it is secondary to a bacterial infection.^{2,3}

In view of the fear that a child presenting with a swollen red eye may be suffering from true orbital cellulitis, the treatment for preseptal cellulitis has always been with broad spectrum antibiotics, given either intravenous or orally, with the intravenous route preferred.¹

Case Report

A 4-year-old boy with no known medical problems presented to our pediatric colleagues with a fever of 6 days' duration associated with vesicular rash for 4 days and right eye swelling for 1 day. The fever was high-grade and temporarily relieved with oral paracetamol. The vesicular rash erupted on the third day of fever, starting at the trunk, and, later, expanding to the face and limbs. It was pruritic in nature and contained clear fluid. There was no known contact with any person with chicken pox. His right eyelid started to swell on day 5 of the fever. It was painful and red. The child had difficulty opening his right eye at the time of presentation but did not complain of blurring of vision. There were no nasal or throat symptoms.

On examination, he was pyrexial with a recorded temperature of 38 degree celcius.

Other vital signs were normal. There was an obvious erythematous, tender, but non-fluctuant, swelling involving the right upper eyelid, extending to the right maxilla. There was also a ruptured vesicular lesion seen on the right eyelid (**Figure 1**). The child was unable to open his right eye. However, upon retracting the upper eyelid, the conjunctiva was noted to be erythematous but not chemotic. Other examinations of the eyes were unremarkable. Rigid nasoendoscopy did not show any sign of acute sinusitis.



Figure 1: Erythematous, tender but non-fluctuant swelling involving the right periorbital region, extending to the right maxilla. A ruptured vesicular lesion is also seen on the upper eyelid

Laboratory investigation revealed a raised white blood cell (WBC) count of 22 with predominant neutrophils, as well as a raised C-reactive protein (CRP) level of 13. Other blood parameters were within normal range. Both blood culture and sensitivity (C&S), as well as swab C&S taken from the ruptured vesicle over the upper eyelid had negative yield. A computed tomography (CT) scan of the orbit showed evidence of a right preseptal collection, measuring 1.0cm x 2.6cm. There was minimal mucosal thickening within bilateral maxillary sinuses but otherwise no overt signs of sinusitis.

The patient was started empirically on intravenous Cloxacillin 750mg four times a day and intravenous Cefotaxime 750mg four times a day.

After one week of intravenous antibiotics and

slow response to therapy, the child was subjected to incision and drainage of the preseptal collection under general anesthesia. There was minimal pus seen and a C&S swab taken at that time was also negative.

He was discharged well after 14 days of intravenous antibiotics and did not have any residual sequelae of Varicella zoster infection during follow-up one month later.

Discussion

Varicella-zoster virus (VZV) is the causative agent of Varicella, more commonly known as chickenpox. Although Varicella is usually a relatively benign and self-limited childhood illness, the disease has been associated with a variety of grave and potentially lethal complications in both immunocompetent, as well as immunocompromised, individuals. The typical clinical presentation of Varicella is characterized by generalized vesicular rash associated with fever. However, atypical clinical presentations and uncommon complications of the disease can be a diagnostic and therapeutic challenge. Some of the rare manifestations of VZV infection in an otherwise immunocompetent person include pneumonitis, cerebellar ataxia, encephalitis, and cutaneous complications, such as bacterial cellulitis, as well as staphylococcal and streptococcal toxic shock syndromes. Another cutaneous complication of Varicella is pupura fulminans, which is associated with thrombocytopenia and disseminated intravascular coagulopathy (DIVC). Varicella gangrenosa is a severe form of necrotizing fasciitis following Varicella infection. These cutaneous complications result from bacterial superinfection of skin lesions, caused most often by 118 *Staphylococcus Aureus* or *Streptococcus Pyogenes*.⁴ This is thought to be due to skin barrier disruption and possibly transient virus-induced immunosuppression.⁵ In the pediatric age group, the incidence of Varicella skin complications ranges from 2.6 % to 41.2 %.⁶

Most of the complications associated with Varicella occur in preschool-age children who are 4 years old or younger, with infectious complications reported more frequently than neurologic complications in this age group.²

Aebi et al. in 1996 reported 10 cases of periorbital cellulitis in patients with Varicella infection. Group A Beta Hemolytic *Streptococcus* was identified in 4 cases, 1 case

involved Hemophilus Influenza Type B, while the remaining 5 cases had unknown etiology.⁵ Lee et al. in 2012 reported a case of preseptal cellulitis following Varicella infection, and Methicillin Sensitive Staphylococcus Aureus was isolated. The patient responded well with intravenous Cloxacillin and surgical drainage of preseptal collection.³

Our patient falls perfectly into the age group in which Varicella skin complications most commonly occur, and, as in the previous reports,

the causative bacterial agent was unknown. It is therefore very important for clinicians to be aware that a simple Varicella infection may lead to cutaneous complications in the pediatric age group, especially in children who are 4 years old or younger. One of these complications may be preseptal cellulitis, which presentation might mimic that of orbital cellulitis. Empirical treatment with antibiotics would be beneficial to the patient.

Conflict of interest: None

How does this paper make a difference to general practice?

- Raises awareness of severe complications which may take place following Varicella infection, in both immunocompetent and immunocompromised individuals.
- Highlights preseptal cellulitis as one of the possible cutaneous complications of Varicella zoster virus infection.
- Creates awareness of the importance of excluding sinusitis as a cause of swollen red eyes.
- Educates clinicians to be aware that a simple Varicella infection may lead to cutaneous complications in the pediatric age group, especially in children who are 4 years or younger.
- Highlights the importance of a hospital referral when there is suspicion of severe complications following a Varicella zoster virus infection.

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