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CASE REPORT

Necrosis of nose skin after varicella zoster infection: A case report

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KEYWORDS

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Summary Varicella zoster virus (VZV) is the causal agent of varicella (chickenpox) and herpes zoster (shingles). Primary VZV infection is a common childhood disease, but elderly patients and those having a compromised immune system are also at risk. We present the case of progressive necrosis of the nose skin in a patient with a compromised immune system and a generalised VZV infection. During the course of his hospital stay and follow-up, the lesion gradually improved with conservative treatment.

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Varicella zoster virus (VZV) is the causal agent of varicella (chickenpox) and herpes zoster (shingles).¹ Primary VZV infection is a common childhood disease in non-vaccinated populations, characterised by a vesicular rash, fever and malaise.² After primary infection, the virus establishes a latent infection in neuronal cells and reactivation results in herpes zoster, a painful rash. Elderly patients and patients with a compromised immune system have a higher severity of disease and are more likely to develop secondary complications. We present a patient with

a progressive necrotic skin lesion on the nose. This was associated with a generalised VZV infection.

Case report

A 77-year-old male was referred from another clinic to the department of internal medicine at our institution. Six months earlier, a small wound had spontaneously formed on the dorsum of the nose, with local dermatitis and crustae. The patient presented with progressive erythema and darkening of the nose skin, which had occurred 4 days earlier.

The patient was admitted at the referral hospital, under suspicion of having a bacterial infection or herpes zoster of the nose skin. He developed a fever of 39.6 °C, and

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Figure 1 Necrotic lesion of the nose skin on initial presentation.

erythematous vesicles formed all over his body. His medical history included symptomatic cholelithiasis, treated with a cholecystectomy 30 years ago, and hypertension, which was currently treated with an angiotensin-converting enzyme (ACE) inhibitor. There was no history of smoking or drug abuse. The patient had not recently travelled abroad. He could not remember whether he had chickenpox during childhood or not.

On initial examination at our clinic, it was observed that the entire skin on the nose dorsum was necrotic, with a sharp line of demarcation (Figure 1). On the tongue, a maculous pustule was seen. Temperature had normalised to 36.5 °C, but the erythematous vesicles were still present (Figure 2).

Laboratory results on admission showed: C-reactive protein of 46 mg l⁻¹, leucocyte count of 7.4 × 10⁹ l⁻¹, haemoglobin of 8.7 mmol l⁻¹ and lactate dehydrogenase of 444 U l⁻¹. Thrombocytes, electrolytes, liver enzymes and renal function were normal. Diagnostic swabs of the vesicles analysed with polymerase chain reaction (PCR) revealed varicella zoster DNA. Bacterial blood cultures were negative on admission, and it remained unclear whether there was a secondary infection of the necrotic nose skin. The patient was admitted at our hospital with

the diagnosis of a generalised varicella zoster infection and had received intravenous (IV) antibiotic therapy with amoxicillin and clavulanic acid, 1200 mg three times daily and antiviral treatment with valaciclovir, 1 g administered four times daily. Additional laboratory findings revealed hypogammaglobulinaemia. Immunophenotyping of a bone marrow aspiration led to the diagnosis of B-cell chronic lymphocytic leukaemia (BCLL).

After approximately 3 weeks, our department was consulted for treatment of the necrotic nose skin. We recommended delaying debridement. Gradually, the patient's skin lesions disappeared and only a few crustae remained. The lesion on the nose also gradually improved and ultimately healed completely within 2 months, without requiring operative treatment (Figure 3).

Discussion

Primary VZV infection is a common childhood disease, with characteristic red papules, which progress into clear vesicles. After the vesicles break, they crust over. These lesions are often accompanied by a rash, fever and malaise.² VZV is highly infectious, occurs worldwide and is endemic in most populations. Symptomatic treatment with lotions for pruritus and fluid substitution to maintain hydration are sufficient in most cases, because the disease is self-limiting. Older age and a compromised immune system are associated with a higher severity of VZV infection. These patients should be treated with antiviral drugs (e.g., acyclovir). After primary infection, the virus establishes a latent infection in the neuronal cells of the dorsal root ganglia. Reactivation results in herpes zoster. This is characterised by a rash with intense pain involving one or adjacent dermatomes. VZV infection and reactivation is a well-known problem in organ transplant recipients and HIV patients, due to decreased function of the immune system.^{3,4}

The most frequently occurring complications of VZV infection are secondary bacterial infections affecting the skin and subcutaneous tissue. These are usually caused by *Staphylococcus aureus* or *Streptococcus pyogenes*. Atypical presentations and uncommon complications of varicella can be diagnostically and therapeutically challenging.⁵ In our patient, the immune system was compromised by

Figure 2 Erythematous vesicles on initial presentation.

Figure 3 Result at six months follow-up.

a haematological malignancy, resulting in a higher risk of complications.

In addition to generalised VZV infection with a secondary skin infection, our differential diagnosis included herpes zoster and necrotising fasciitis. Because our patient did not have any pain, the diagnosis of herpes zoster was unlikely. In the literature, no reports regarding superficial necrosis associated with VZV are available.

The association between VZV and necrotising fasciitis in children is known for over 50 years.⁶ A minor traumatic skin lesion without a visible wound forms a *porte d'entrée* for bacteria, resulting in a rapidly spreading infection along the fascial plane.⁷ In some patients, a herpes zoster lesion is the *port d'entrée*. In the early phase of the disease, clinical signs can often not be distinguished from other types of lesions, such as erysipelas or cellulitis.⁸ In our described case, there were predisposing factors for necrotising fasciitis, because the skin barrier was weakened and the immune system was compromised. However, necrotising fasciitis in the head and neck region is rarely seen.⁹ Publications on necrotising fasciitis almost always mention infection or necrosis of the fascia of the muscle. In the facial area, with little or no fascia, the infection is limited to the subcutaneous tissue; skin and muscle are not involved. This makes necrotising fasciitis an unlikely diagnosis. Another important difference is the rate of progression. In our patient, there was slow progression, whereas necrotising fasciitis usually progresses rapidly. This disease needs swift surgical exploration with aggressive debridement and intravenous antibiotic therapy.

In our patient, the necrotic nose skin slowly desquamated, as re-epithelialisation occurred. Pearlman et al. reported of a patient with nose skin necrosis, whom received chemotherapy for Waldenström's disease.¹⁰ In their case, the nose healed by secondary intention within

weeks, with a good aesthetic result. They pointed out that conservative management should be considered, even when there is extensive nasal skin loss. In our case, there was a similar course: the wound healed within 2 months, with an acceptable aesthetic result at 6 months' follow-up (Figure 3).

In conclusion, VZV infection is a common self-limiting childhood disease, but elderly patients and those having a compromised immune system are also at risk. Along with characteristic skin lesions, complications such as secondary infections can occur. We report of a patient with a compromised immune system and a generalised VZV infection, who developed necrosis of the nose skin. Since an acute infection such as necrotising fasciitis was ruled out, the most appropriate treatment was conservative.

Conflict of interest

None.

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