



Contents lists available at ScienceDirect

Journal of Hand Surgery Global Online

journal homepage: www.JHSGO.org

Case Report

Progressive Giant Orf Disease With Recurring

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ARTICLE INFO

Article history:

Received for publication April 24, 2026

Accepted in revised form May 1, 2026

Available online June 16, 2026

Key words:

Amputation

Imiquimod

Immunocompromised

Interferon alfa-2a

Orf disease

Immunocompromised patients are exposed to a variety of viral and bacterial infections. Orf disease is a viral infection of the *Parapoxvirus* family cause mild symptoms in healthy people. In patients with immunodeficiency-induced giant atypical lesions, the management of giant and multiple lesions of the hand in an immunocompromised host is problematic. In this report, we present the extensive involvement of the hand and lower limb in a patient with immunodeficiency. Contamination of surgical instruments had caused the disease to spread rapidly to other areas during primary lesion excision.

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Orf disease is a viral infection of the *Parapoxvirus* family, transmitted to humans through direct or indirect contact with sheep or goats.¹ The initial manifestations of the disease often appear on the hands. The incubation period ranges from 2 to 4 days.² The clinical manifestations of the viral infection heal spontaneously within 6 to 12 weeks.² Occupations with close contact with livestock, such as livestock handlers, butchers, and veterinarians, are at increased risk. Because the disease is self-limiting, referral to hand surgeons is uncommon.^{2,3} In certain patients with immunodeficiency, the infection may cause more severe and uncontrollable symptoms.⁴ Our information on such cases is based on certain case reports, and experience remains limited. In this report, we present the extensive involvement of the hand and lower limb in a patient with immunodeficiency.

Case Report

Written informed consent was obtained from the patient for patient's anonymized information to be published in this article. The patient was a 59-year-old man who had a scratch and small laceration on the volar surface of the left ring finger during the slaughtering of a sheep. Initial treatment consisted of wound dressing and administration of a first-generation cephalosporin antibiotic. For the past 2 years, he had been diagnosed with myelodysplastic syndrome

with single-lineage dysplasia and had been receiving chemotherapy; the last chemotherapy session had taken place 2 months prior to the finger injury. He was always anemic, with hemoglobin levels below 10 g/dL. One week after the injury, a maculopapular lesion developed on the finger, which rapidly changed into a 2 × 2 cm granulation mass. A general surgeon performed a shave excision, and the resulting skin defect was covered with a split-thickness skin graft obtained from the left thigh (Fig. 1). Four weeks after graft placement, there was rapid growth of granulation tissue on the volar and dorsal surfaces of the hand to the midcarpal region, developing an atypical tumor mass measuring 10 × 5 cm (Fig. 2). Simultaneously, the donor site on the thigh became affected, leading to a similarly large hemorrhagic, foul-smelling, tumoral lesion measuring approximately 10 × 10 cm (Fig. 3). The extensive mass was associated with central necrosis and increased bacterial infection. The patient became severely ill and debilitated and was referred to hand surgery. Given the severe bacterial infection and the patient's deteriorating condition, wrist amputation was selected for the patient. During surgery, the tumoral lesion was covered using plastic adhesive drapes, and because the lesion extended to the metacarpals, amputation was performed at the wrist, providing an adequate tumor margin. All surgical sets were replaced after the amputation. Local interferon-alpha was injected into the surgical stump, and then, the stump was reconstructed. Two days after the surgery, the thigh lesion underwent wide resection of skin and tumor tissue with a 2-cm margin down to the level of the muscular fascia. Furthermore, Interferon-alpha was also injected along the wound margins. No surgical coverage was performed for the thigh; instead, the vacuum-assisted closure of the wound was performed, allowing secondary healing.

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<https://doi.org/10.1016/j.jhsg.2026.101059>

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Figure 1. Clinical photo of the fourth finger after primary lesion excision and covered with a split-thickness graft from the anterolateral thigh.

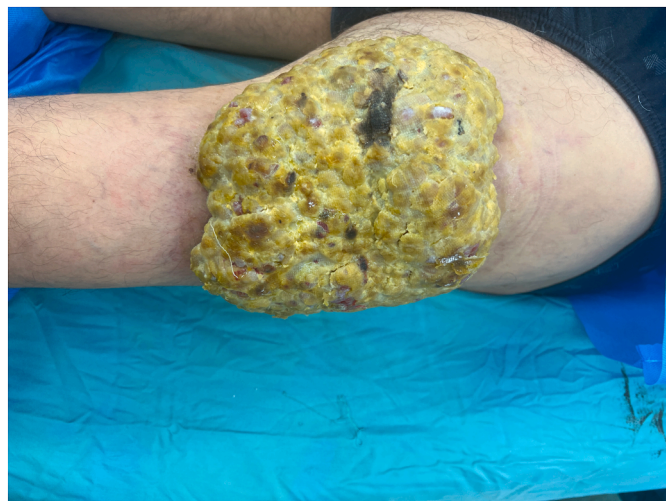


Figure 3. The donor site involvement on the thigh with a giant Orf lesion.



Figure 2. Giant Orf lesion developed after split-thickness graft placement.

Simultaneously, medical treatment included interferon alfa-2a (3 million IU twice weekly) and daily topical 5% imiquimod cream for the lower-limb lesion after wide resection, continued for 6 weeks, along with systemic antibiotic therapy. According to pathological results, viral infection involvement was diagnosed (Fig. 4A, B). At the 6-month follow-up, complete recovery was observed with no evidence of recurrence (Fig. 5).

Statement of informed consent

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

Discussion

Orf disease heals within 6 weeks in patients without immunodeficiency, but in immunocompromised patients, impaired T

cell function leads to more severe clinical manifestations, leading to multiple or giant lesions. The course of disease in these patients is prolonged, and they have systemic or more debilitating symptoms.⁵

Topical imiquimod use twice daily for 5 to 10 days has a positive effect on the healing of Orf skin lesions. It stimulates local production of inflammatory cytokines and contributes to faster healing of cutaneous lesions.^{2,5} Giant or multiple lesions in patients with immunodeficiency pose challenges, and the emergence of bacterial infections may further worsen the patient's clinical condition.^{1,2} Some reports have described that intralesional interferon-alpha or cidofovir, which are used in patients with cytomegalovirus retinitis, can be applied for treatment.^{1,2} When the hand is affected by giant lesions in immunodeficiency patients, systemic therapy does not work, necessitating surgical intervention. The surgical approach includes wide excision and skin grafting.⁵ Recurrence after skin resection with adequate margins is rare, but it is possible in immunodeficient patients.⁵ There is no experience regarding the management of recurrence after initial resection of the lesion. Amputation may be considered in cases with large atypical lesions in distal limbs, particularly if it is simultaneous with bacterial infection.⁵ In our patient, it seems that contamination of surgical instruments during the initial resection and nonreplacement of the surgical sets caused the spread of viral infection to the donor site in the lower limb.⁶ The immunodeficiency due to myelodysplasia caused the development of large and atypical giant lesions. Several therapeutic options have been reported for giant Orf in patients with immunodeficiency, including surgical excision, cryotherapy, topical imiquimod, topical idoxuridine 40% application, topical or intralesional cidofovir, and intralesional and systemic interferon injection.^{4,5}

Due to the large size of the hand lesion and the presence of bacterial infection in our patient, amputation played an important role in controlling the disease. To overcome the recurrence, local interferon-alpha injection into the wound margins combined with systemic therapy was more effective. Recontamination and spread to other areas are important factors in the resection surgery of infectious lesions, particularly viral lesions; hence, contaminated surgical instruments must be replaced during the procedure. In our patient, it appears that contamination of the surgical instruments during the primary resection, as well as removal of the skin graft

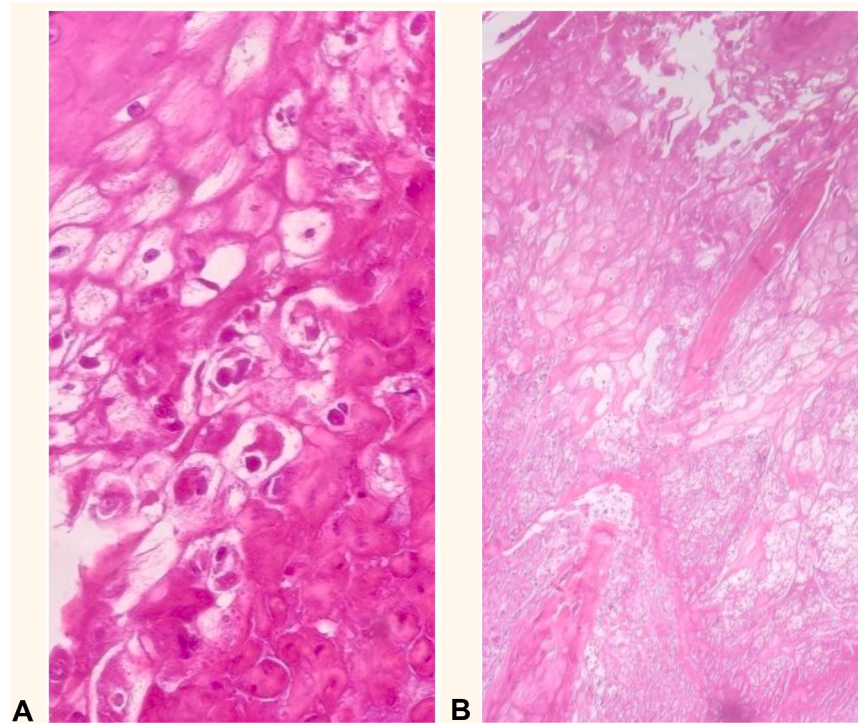


Figure 4. **A** Section shows skin tissue with ballooning degeneration and spongiosis (H&E, 4×). **B** Evidence of viral cytopathic effect and inclusion is also present (H&E, 20×). H&E, hematoxylin-eosin.



Figure 5. Clinical photo of patient improvement after 6 months of wrist amputation and wide resection of the lesion on the thigh.

with contaminated tools, contributed to the spread of the infection to the lower limb at the donor site. Therefore, resection of the lower-limb lesion was performed 2 days later, and the concurrency of the surgery, according to the contamination of the instruments, personnel, and environment, could facilitate the spread of the disease. Moreover, the use of wound vacuum-therapy combined with topical 5% imiquimod contributed to secondary healing without recurrence. Vacuum therapy and secondary healing may be considered treatment options in immunodeficient patients with large lesions. Removing lesions with normal margins is essential; amputation or resection must be performed at a

level free of viral contamination.⁵ The report by Tan et al⁷ indicates the effects of surgical resection with normal margins in preventing recurrence of Orf lesions in patients with immunodeficiency.

In conclusion, Orf disease may spread and present with giant, persistent, and atypical lesions in immunocompromised patients. In cases where surgical intervention and resection of lesions are performed, contamination of surgical instruments can spread to other areas. Hence, contaminated surgical instruments must be replaced during the procedure. Amputation of the distal limb with a safe margin is a suitable treatment in cases with a giant lesion added with bacterial infection.

Conflicts of Interest

No benefits in any form have been received or will be received related directly to this article.

Acknowledgments

We would like to express our special thanks and profound gratitude to Clinical Research Development Unit of Imam Khomeini Hospital, Urmia University of Medical Sciences, Urmia, Iran, for their guidance, consultation, and support.

Ethical approval declaration

The study was approved by the medical research and ethics committee of the Urmia University of Medical Sciences.

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