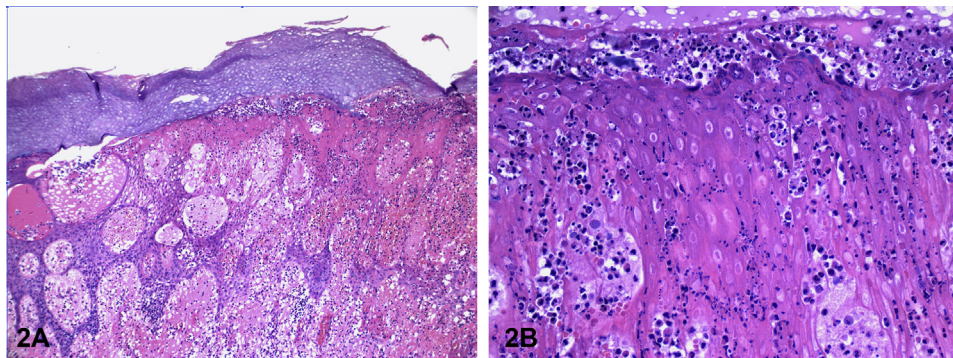


# Rapidly growing bullous plaque on the hand



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## CASE PRESENTATION

A 46-year-old woman with no dermatologic history presented to the dermatologist with a complaint of an enlarging, painful, and ulcerating bullous plaque on the left hand (Fig 1), present for 3 weeks. The patient worked as a cashier and owned livestock, including horses, cattle, and chickens. No drainage, other areas of involvement, or contacts with similar lesions were noted. She denied any injury to the area before the development of the lesion; however, she reported that an unsuccessful incision and drainage was attempted at a recent emergency department visit. Gram stain result from the previous incision and drainage was negative. A shave biopsy was obtained, with hematoxylin-eosin staining (Fig 2).

### Question 1: What is the most likely diagnosis?

- A. Squamous cell carcinoma (SCC)
- B. Ecthyma contagiosum (orf)
- C. Cutaneous anthrax
- D. Herpetic whitlow
- E. Milker's nodule

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**Answers:**

**A.** SCC—Incorrect. SCC most commonly presents on sun-damaged skin as an erythematous hyperkeratotic papulonodule, but the clinical presentation can be variable. Histologically, SCC displays overlying parakeratosis, atypical keratinocytes invading the dermis.

**B.** Ecthyma contagiosum (orf)—Incorrect. The clinical history (cattle farmer) of this case does not match that of orf. Orf is caused by a different virus in the Poxviridae family of viruses than milker's nodules and is transmitted by direct contact with infected sheep and goats. Milker's nodules are associated with cattle, although the clinical and histologic presentation of the 2 viruses is identical.<sup>1</sup> The collective term for these viruses is "farmyard pox."

**C.** Cutaneous anthrax—Incorrect. Transmission of anthrax from *Bacillus anthracis* is mainly through contact with infected animals (wild and domestic) or contaminated animal products (leather, wool, or meat). The skin lesions are typically located on the arms, face, and neck and consist of a nontender bulla or ulcer surrounded by erythema that develops into a necrotic plaque.<sup>2</sup>

**D.** Herpetic whitlow—Incorrect. Herpetic whitlow is caused from an infection with herpes simplex virus on the digits. It presents as recurrent local erythema, edema, and tender grouped vesiculopustules progressing to erosions. The diagnosis can be made clinically but additional testing is definitive.

**E.** Milker's nodule—Correct. This zoonotic dermatosis is caused by a parapox virus transmitted from infected lesions on dairy cattle to humans via direct contact. It is most commonly observed in young people who have recently started milking cattle or in veterinary students. The infection in cattle is usually mild and characterized by papules in the muzzle area that can be difficult to see.<sup>1</sup> This is more common than cowpox, which is caused by a member of *Orthopoxvirus* and is endemic in wild rodents. The lesions typically develop through different clinical stages similar to orf. At the inoculation site, a red-blue papule develops, which quickly progresses into a pustule or bullae with central umbilication and crusting. The lesion is typically tender and it is associated with mild fever and malaise.<sup>3</sup>

**Question 2: What is the most characteristic feature of this disease on hematoxylin-eosin staining?**

**A.** Bright red eosinophilic intracytoplasmic inclusions

**B.** Molding, margination, and multinucleation

**C.** Acid-fast bacillary organisms located in cytoplasm of histiocytes

**D.** Round thick-walled structures with single broad-based buds

**E.** Small circular basophilic microorganisms peripherally located in the cytoplasm of histiocytes and some giant cells

**Answers:**

**A.** Bright red eosinophilic intracytoplasmic inclusions—Correct. Milker's nodules and orf have identical findings on histology and are differentiated by association with cattle (milker's nodule) versus sheep (orf). The lesions show parakeratosis; epidermal proliferation; viral cytopathic changes, including cytoplasmic and nuclear vacuolation; and upper epidermal eosinophilic cytoplasmic inclusions.<sup>3</sup>

**B.** Molding, margination, and multinucleation—Incorrect. This histology is characteristic of herpes virus, in which the histology shows keratinocyte ballooning degeneration, multinucleation, nuclear molding, and chromosomal margination.

**C.** Acid-fast bacillary organisms located in cytoplasm of histiocytes—Incorrect. This histology describes that observed in cutaneous tuberculosis.

**D.** Round thick-walled structures with single broad-based buds on the surface of some—Incorrect. This histology describes that observed in cutaneous blastomycosis.

**E.** Small circular basophilic microorganisms peripherally located in the cytoplasm of histiocytes and some giant cells—Incorrect. This histology describes that observed in leishmaniasis.

**Question 3: What is the best treatment for this diagnosis?**

**A.** Valacyclovir

**B.** Itraconazole

**C.** Supportive care

**D.** Doxycycline

**E.** Ciprofloxacin

**Answers:**

**A.** Valacyclovir 1 g orally twice a day for 10 days—Incorrect. Treatment is not necessary in immunocompetent patients because the infection

spontaneously resolves within several weeks. Valacyclovir is an antiviral medication that is a prodrug of acyclovir, which inhibits DNA synthesis and viral replication. There is a lack of evidence that this medication is effective in the treatment of milker's nodule.

**B.** Itraconazole 200 mg by mouth twice a day for 6 months—Incorrect. Itraconazole is an antifungal medication that decreases ergosterol synthesis and inhibits fungal cell membrane formation; therefore, it would not be effective against viral illnesses such as milker's nodule.

**C.** Supportive care—Correct. In humans, milker's nodule is a self-limited diagnosis with no need for antiviral treatment. The infected animals should be isolated and personal protective equipment should be used to decrease the spread of infection. There is a vaccine available for cattle, and infection in humans confers immunity.<sup>1</sup>

**D.** Doxycycline 100 mg orally twice a day for 1 week—Incorrect. Doxycycline is a tetracycline

antibiotic that inhibits protein synthesis by binding to the bacterial 30S ribosomal subunit. It would be ineffective against viral infections.

**E.** Ciprofloxacin 500 mg orally twice a day for 10 days—Incorrect. Ciprofloxacin is a fluoroquinolone that inhibits DNA gyrase in susceptible organisms. This antibiotic would be ineffective against viral diseases such as milker's nodule.

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**Abbreviation used:**

SCC: squamous cell carcinoma

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