

Coexistent Infections on a Child's Distal Phalanx: Blistering Dactylitis and Herpetic Whitlow

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We report a case of coexistent Staphylococcus aureus and herpes simplex virus (HSV) infections responsible for a bullous and vesicular eruption on a child's distal phalanx. Blistering distal dactylitis (BDD), a superficial infection of the distal portion of the finger, is seen most commonly in children and is caused by either β -hemolytic streptococci or S aureus. Herpetic whitlow, also a blistering infection found on children's distal fingers, is a bacteriologic sterile infection caused by HSV-1 or HSV-2. In this report, we note that these infections may coexist on the distal phalanx. This case has implications for diagnosis and treatment of children's blistering hand diseases.

Blistering distal dactylitis (BDD) is a superficial blistering lesion over the anterior fat pad of the distal portion of a finger or thumb. The lesion may have paronychia extension, which is usually caused by β -hemolytic streptococci.¹ *Staphylococcus aureus* is increasingly reported as the pathogenic cause in case reports.^{2,3} BDD caused by *S aureus* is more likely to involve multiple fingers, but etiologic distinction can be made only by Gram stain and culture.³

Clinical characteristics of BDD include a large, tense, and superficial but painful bulla with a base that is sometimes erythematous.² The bullae are usually filled with thin white pus.¹ Two- to 16-year-olds are most commonly affected.² Treatment involves draining the blister and prescribing a course of antibiotics known to be effective against the isolated species.¹

Herpetic whitlow is a herpes simplex virus (HSV) infection characterized by erythema, swelling, and nonpurulent vesicle formation of the distal phalanx; these symptoms can be painful.⁴ The patient may present with systemic complaints of fever, lymphangitis, and local adenopathy.^{4,5} In children, herpetic whitlow is often found secondary to autoinfection from HSV gingivostomatitis or after exposure to adults' oral herpes.⁴ Herpetic whitlow is diagnosed by a positive Tzanck test or viral culture of cellular material extracted from the base of the ruptured vesicle. The infection resolves within 14 days. If the infection is diagnosed early, acyclovir may be helpful in shortening its course.⁴ Therefore, BDD and herpetic whitlow are unique clinical entities that can usually be distinguished by history and physical examination alone. We present the case of a bullous and vesicular eruption on a child's distal phalanx; cultures of this eruption tested positive for *S aureus* and HSV.

Case Report

A 1-year-old girl was referred to our dermatology clinic several days after developing a bullous and vesicular eruption on her right index finger. The girl's mother had a recent outbreak of orolabial HSV infection, the first episode in her life. Several days after the mother's outbreak, the girl developed a blister on her finger. Clinical diagnoses were BDD on the lateral nail fold and herpetic whitlow near the proximal nail fold (Figure). Tzanck test results of fluid extracted from the lesions showed no multinucleated giant cells. Bacterial and viral cultures of the lateral nail-fold lesion were positive for *S aureus* and HSV. The girl was not treated then, as the time for antiviral treatment of herpetic whitlow was thought to have passed. The girl's local doctor was informed of the sensitivities of her bacterial culture to antibiotics, and her BDD was treated with a cephalosporin. The lesions resolved.

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One-year-old girl's right index finger with coexistent blistering distal dactylitis and herpetic whitlow.

Comment

BDD and herpetic whitlow are similar diseases in presentation and epidemiology. Both are blistering infections of the distal phalanx, and both are found primarily in children. Previously, these diseases were thought to be mutually exclusive. We have presented a case of coexistent *S aureus* and HSV infections that induced bullous and vesicular lesions on a child's finger. This case has implications for diagnosis and treatment of childhood blistering hand diseases.

BDD was first defined by Hays and Mullard¹ in a 1975 report of 13 children with blistering hand diseases. Incision of these tender blisters typically yielded a thin white pus. The lesions were unilocular and involved the lateral and proximal nail folds. All lesions that were cultured grew β -hemolytic streptococci; 3 of these lesions also grew staphylococci. None of the lesions was sterile. Incision and drainage, plus the appropriate antibiotic, proved curative in all cases. Hays and Mullard defined BDD as "a distinct clinical entity manifested by a superficial blistering lesion over the anterior fat pad of the distal portion of a finger or thumb." Clinically, BDD presents as tense painful bullae.² Although BDD has been described as relatively rare, in 1982, Schneider and Parlette⁶ reported an average of 24 cases diagnosed annually in a dermatology clinic. This disease appears almost exclusively in 2- to 16-year-olds, but cases in adults have been reported.⁷ The increasing incidence in isolation of *Staphylococcus* from cases of BDD suggests a change in pathogenic patterns.^{2,3} These bacterial

pathogens can be distinguished only by Gram stain and culture. Patients with staphylococcal infections have responded well to a 10-day course of dicloxacillin, a penicillinase-resistant antibiotic that is well absorbed orally and well tolerated.² Historically, BDD was treated successfully with a 10-day course of penicillin or erythromycin.¹ The disadvantage of these treatments is increased bacterial resistance in staphylococcal species.²

In 1959, Stern et al⁸ coined the term *herpetic whitlow* to describe an HSV-caused finger infection in medical personnel. Although herpetic whitlow blisters seem to contain pus, manipulation shows only a small amount of clear fluid.⁴ Since 1959, there have been fewer reports of herpetic whitlow in medical personnel, presumably because protective gloves are being used more.⁵ Most cases now occur secondary to autoinfection with HSV gingivostomatitis (in children) and secondary to HSV gingivostomatitis or genital infections (in adults).^{5,9,10} Gill et al^{9,10} reported an incidence of 2.4 cases per 100,000 population in one year. Thumb or finger sucking is the most common mode of autoinfection in 1- to 3-year-olds.⁹ Infants are often exposed while using their fingers to explore the mouths of adults.⁵ Systemic complaints (eg, fever, lymphangitis, local adenopathy) are further evidence of an HSV infection.⁴ Patients also may recall a prodrome of pain and tingling or burning in a distal phalanx, followed by digital swelling and erythema.¹⁰ Vesicles typically appear after the prodrome and systemic symptoms. Multiple vesicles can coalesce, and the skin surrounding the vesicles

may become necrotic.⁴ The characteristic nonpurulent fluid and vesicular-to-confluent multilocular bullae distinguish herpetic infection from BDD. Vesicles remain about 10 days; then, peeling and replacement with normal skin occur within one week.⁴ Recurrences, generally less severe than the original infection and lasting only 7 to 10 days, occur in as many as 20% of patients.^{5,10}

Diagnosis involves “unroofing” the vesicle and performing a Tzanck test of the base of the lesion or culturing the lesion for HSV. The Tzanck test is quick but detects only 70% of infections later confirmed by culture.⁴ A culture is the most sensitive test; however, test results may not prove positive until 48 hours after inoculation.⁴ Herpetic whitlow is a self-limited disease that usually resolves without treatment within 14 days.⁹ Early treatment with acyclovir, however, has been successful for decreased pain and healing time^{9,10}; surgical incision or debridement is not necessary for treatment and should be used only to relieve pain.¹⁰

Differential diagnoses of children’s blistering hand diseases include traumatic, thermal, or chemical burns; HSV infections; BDD; and staphylococcal bullous impetigo. Except for bullous impetigo, all these conditions can usually be distinguished by history alone. Bullous impetigo, like BDD, is caused by staphylococcal bacterial infection. The blisters of impetigo, however, are extremely superficial compared with those of BDD.² Differentiation of BDD and herpetic whitlow involves using a Tzanck test, a Gram stain, and bacterial and viral cultures to evaluate the lesions. If lesions of both infections show up clinically, confirmation of which infection is present is needed to select appropriate treatment. We have presented a case of coexistent infections. Because herpetic whitlow and BDD are treated differently, determining

whether an infection is bacterial, viral, or both is important. A case of herpetic whitlow can be managed with antiviral agents; a case of BDD requires a course of an appropriate antibiotic. In conclusion, simultaneous bacterial and viral infections should enter the differential diagnosis of any distal phalanx infection manifested by simultaneous bullous and vesicular lesions.

REFERENCES

1. Hays GC, Mullard JE. Blistering distal dactylitis: a clinically recognizable streptococcal infection. *Pediatrics*. 1975;56:129-131.
2. Woroszylski A, Duran C, Tamayo L, et al. Staphylococcal blistering dactylitis: report of two patients. *Pediatr Dermatol*. 1996;13:292-293.
3. Norcross MC, Mitchell DF. Blistering distal dactylitis caused by *Staphylococcus aureus*. *Cutis*. 1993;51:353-354.
4. Feder HM, Long SS. Herpetic whitlow: epidemiology, clinical characteristics, diagnosis, and treatment. *Am J Dis Child*. 1983;137:861-863.
5. Feder HM. Herpetic whitlow in an infant without defined risks. *Arch Dermatol*. 1995;131:743-744.
6. Schneider JA, Parlette HL III. Blistering distal dactylitis: a manifestation of group A beta-hemolytic streptococcal infection. *Arch Dermatol*. 1982;118:879-889.
7. Palomo-Arellano A, Jimenez-Reyes J, Martin-Moreno L, et al. Blistering distal dactylitis in an adult. *Arch Dermatol*. 1985;121:1242.
8. Stern H, Elek SD, Millar DM, et al. Herpetic whitlow: a form of cross-infection in hospitals. *Lancet*. 1959;2:871-874.
9. Gill MJ, Arlette J, Buchan KA. Herpes simplex virus infection of the hand. *J Am Acad Dermatol*. 1990;22:111-116.
10. Gill MJ, Arlette J, Tyrrell DL, et al. Herpes simplex virus infection of the hand: clinical features and management. *Am J Med*. 1988;85(2A):53-56.