Herpetic Whitlow—Occupational Hazard to the Anesthesiologist

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Little mention has been made of occupational hazards to the anesthesiologist's hands. A case history describing a herpes simplex finger infection and a review of its epidemiology will illustrate its potential threat to the anesthesiologist.

CASE REPORT

A healthy, right-handed, 26-year-old anesthesia resident, who had no history of hand injury or herpes simplex infection, nicked the bed of the right thumb nail while cutting his nails. There was no bleeding or other gross sign of discontinuity of the skin. He continued to administer anesthetics, using various airways and tracheal tubes which he inserted and subsequently cleaned with his bare hands. All of his patients in the two weeks preceding and week following the injury were adults who were afebrile and without vesicles of the face, lips, or mouth.

On the fourth postinjury day (PID) he experienced burning at the injury site and tenderness in the right axilla, and began frequent warm soaks of the thumb. He consulted a surgeon on PID 6, when he palpated axillary nodes and noted warmth, throbbing pain, obvious swelling of the terminal phalanx, and exquisite tenderness near the nail. There was no fever or malaise at any time during the illness. Cutting the corner of the nail at the site of injury and incising the skin adjacent to the nail over the most tender area failed to produce pus. Warm soaks and tetracycline were prescribed. On PID 9 a light gray periungual bulla appeared, demarcated from the now purplish thumb by a margin of erythema. From the proximal aspect of the bulla, lymphangitis streaked toward markedly tender axillary nodes. Upon incision, slightly viscid, clear yellow fluid flowed from the tense bulla, suggesting a herpes simplex infection to consultants.† The resident received procaine penicillin intramuscularly, discontinued tetracycline, and began a ten-day course of phenoxymethyl penicillin, with prompt disappearance of lymphangitis and adenopathy. Over the next few days satellite vesicles appeared and coalesced over the palmar aspect of the thumb (fig. 1) and several painful vesicles arose on the lips and tongue.

On PID 14 complement-fixation ‡ and neutralition of 1:8. The following day the constant dull pain suddenly abated. Seropurulent material was aspirated from a bulla to inoculate a culture of WI38 Ewing fibroblasts, and the presence of the virus of herpes simplex was demonstrated later with virus-specific antiserum.§ Over the following week the lesions encrusted and separated from the underlying healthy skin, and the resident returned to work after a lapse of two and a half weeks. On PID 31 complement-fixation and neutralization titers were positive in a dilution of 1:8; two months later the neutralization titer was still 1:8. There has been no recurrence on the thumb in the subsequent five months, though vesicles have recurred at monthly intervals on the lips and tongue, usually following identifiable stress, cold weather, or upper respiratory infection.

DISCUSSION

Herpes simplex is a practically universal infection of man, most prevalent in the early years of life after the six months of protection afforded by placentally-transferred maternal antibody has waned. By the age of 15 years as much as 96 per cent of the population, depending upon socioeconomic conditions, possesses antibody,[1] though only 10–15 per cent of infected individuals have clinical illnesses[2] which involve ectodermal derivatives and are accompanied by constitutional symptoms and increased antibody titers. The portal of entry and, presumably, host factors determine the particular manifestation of the *primary illness* —for example, herpes labialis or "cold sore," eczema herpeticum, traumatic herpes, gingivostomatitis, keratoconjunctivitis, vulvovaginitis, meningoencephalitis, and generalized visceral disease. Secretions from infected tissue

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‡ Courtesy of Division of Laboratories, Commonwealth of Pennsylvania Department of Health, 2100 West Girard Avenue, Philadelphia 19130.

zation § antibody titers were positive in a dilu-

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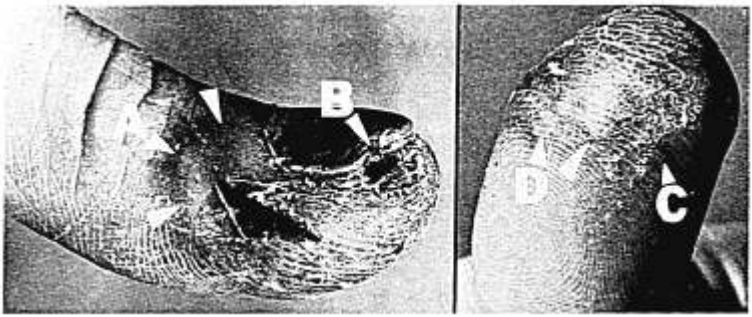

FIG. 1. Superficial incision of periungual bulla demarcated by erythema (A) and site of finger injury (B) failed to reveal purulence. Satellite vesicle (C) on palmar aspect of thumb near honeycombed structure (D) formed by coalescence of vesicles. Photographs were made on the twelfth day following injury when the skin was dry and scaly.

continue to be a reservoir of infective virus weeks after the individual becomes asymptomatic. At some point the virus enters a latent phase from which it cannot be recovered. Diverse physiologic and physical stimuli (fever, menstruation, ultraviolet light, stress, intercurrent infection) may result in a *recurrence* of the primary illness at the original site, despite circulating antibody, with local discomfort, constitutional symptoms rarely, and an inconsistent antibody response.

In contrast to the herpetic finger infection of childhood which follows gross trauma and exposure to herpetic lesions,[2-4] the finger infection occurring in adults has been reported only in medical personnel who suffer trivial finger injury and whose occupation involves exposure to pharyngeal and respiratory secretions, often from patients lacking herpetic lesions.

Stern[5] was the first to identify this occupational hazard, reviewing 54 such infections in nurses between the ages of 18 and 29 years. A third of the 49 per cent who had no antibody to herpes virus prior to beginning work developed lesions (primary illness) within one year. His serologic survey also identified several individuals who had moderate titers before developing lesions (recurrence). Most cases developed during the care of patients lacking clinical evidence of herpes infection. The virus was isolated from 1.2 per cent of asymptomatic adult patients, a value about half that reported by others,[1] and 6.5 per cent of postoperative neurosurgical patients, most of whom were comatose and required frequent suctioning of secretions. Seven of the nurses had recurrences a month to three years later.

Stern called the lesion a "whitlow" (synonym: felon), despite the location of a third of the eruptions proximal to the terminal phalanx. At some point, all of the lesions simulated pyogenic infection. With or without surgical intervention, secondary infection which was resistant to antibiotics frequently occurred even when the isolate demonstrated *in vitro* sensitivity. Most patients had vesicles which permitted a clinical diagnosis, but a few had large bullous lesions when first seen, as in the case reported here. Constitutional symptoms were uncommon (low-grade fever in seven, transient adenopathy in 13), though pain and natural course of the lesion resulted in a loss of three weeks' work per nurse.

More recently, Hambrick[6] summarized the primary illnesses of two surgical residents and four student nurses who had suffered trivial finger injuries and had given oropharyngeal care three to seven days prior to the appearance of lesions. These patients were more acutely ill than those of Stern, with lymphadenopathy in all six, lymphangitis in two, gingivostomatitis in one, and fever (100–103 F) in five; he attributed this to the inherent

differences in the series, Stern having searched for all cases rather than studying only those who sought treatment.

There has been no report of such an illness in an individual administering anesthesia, though the lesion probably occurs occasionally. Anesthesiologists should consider the possibility of herpetic whitlow whenever a finger infection occurs. In suspected cases, surgical treatment should be limited to relieving tension in tense vesicles and bullae lest, as Stern and Hambrick caution, severe infection with further ulceration and a protracted course ensues. Often, the illness may be aborted early in its course by applying to a vesicle idoxuridine (Stoxil—Smith, Kline & French), a pyrimidine analog which irreversibly inhibits thymidine incorporation into viral DNA. Infections which appear pyogenic when first seen should be given a trial of soaks and an appropriate antibiotic,[7] with incision and drainage later, depending on the response to conservative therapy. Finally, anesthesiologists should take suitable precautions when treating patients who may expose them to infectious material. In addition to patients with herpetic lesions and recent convalescents from herpes, these include young children (oral viruses are found in as many as 26 per cent of asymptomatic children age 6 months to 2 years old[1]) and patients who have diverse disease states on which unrecognized herpes may supervene (burn patients treated with antibacterial agents,[8] measles,[9] kwashiorkor,[9] Hodgkin's disease, and Wiskott-Aldrich syndrome[10]).

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Surgery

HYPERCARBIA FOR CAROTID SURGERY Carotid endarterectomies were performed without shunts in 137 patients. General anesthesia with methoxyflurane and *d*-tubocurarine was used, with CO_2 added. In 15 to 20 minutes the venous CO_2 tension reached 70 to 100 mm Hg without cardiac irritability or arrhythmias. In a previous series with cyclopropane, arrhythmias were a problem at this CO_2 tension. Advantages of the technique include lowered cerebral metabolism and oxygen requirement under general anesthesia; increased cerebral blood flow from the hypercarbia and hypertension; and avoidance of the encumbrance of the shunt apparatus. Good results were obtained in 93 per cent of patients. (*Young, J. R., and others: Carotid Endarterectomy without a Shunt, Arch. Surg. 99: 293 (Sept.) 1969.*)