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## Adults Clinical Communications

### EXPOSURE TO MACAQUE MONKEY BITE

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□ **Abstract—Background:** The herpes B virus is a zoonotic agent that is endemic among macaque monkeys only, but can cause fatal encephalomyelitis in humans. **Case Report:** A 26-year-old female presented to a U.S. emergency department after being bitten by a wild macaque monkey. The emergency medicine team administered rabies immunoglobulin and rabies vaccine. The team also prescribed acyclovir for prophylactic coverage against herpes B, a deadly zoonotic agent that is endemic among macaque monkeys. A discussion of background, exposure, transmission, symptoms, treatment for herpes B, including latest data available, literature, and Centers for Disease Control and Prevention guidelines are included. **Why Should an Emergency Physician Be Aware of This?:** Zoonotic exposures can cause infectious diseases, which are unfamiliar and deadly. The emergency physician's knowledge of the association between the deadly herpes B infection and wild macaque monkey may expedite treatment and be instrumental in patient morbidity and survival. © 2015 Elsevier Inc.

□ **Keywords—herpes B; encephalomyelitis; animal bites; antiviral; Macaca; macaque; monkey; zoonotic disease; infectious disease**

#### INTRODUCTION

In an age of increasing international travel, emergency physicians are encountering unfamiliar presentations in returning travelers. A 26-year-old female presented to a U.S. emergency department after being bitten by a wild

macaque monkey. The emergency department (ED) team administered rabies immunoglobulin and rabies vaccine. The team also prescribed acyclovir for prophylactic coverage against herpes B, a deadly zoonotic agent that is endemic among macaque monkeys.

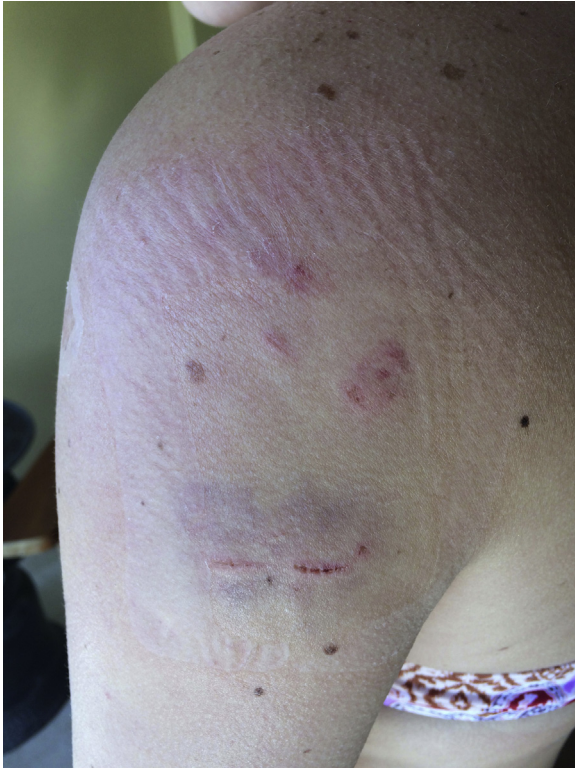
#### CASE REPORT

A 26-year-old female presented to a U.S. ED for a second dose of rabies vaccine, 1 week after being bitten by a macaque monkey on her trip to Bali (Figures 1 and 2). She had been treated at a Balinese hospital with one intramuscular injection dose of Verorab®, an inactivated rabies vaccine. Her examination demonstrated a healing bite wound on the shoulder without signs of rash or infection.

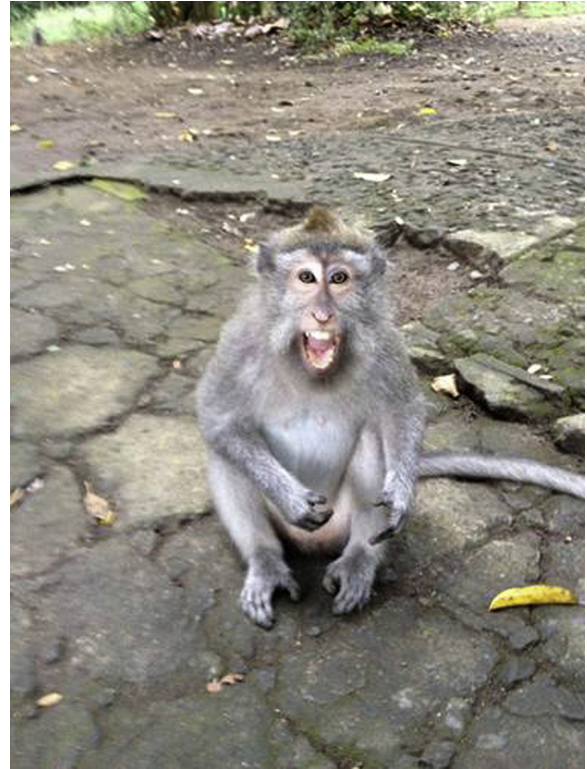
After consultation with public health officials, the ED team deemed the patient to be at risk for developing the herpes B viral infection from the monkey bite. The patient was prescribed acyclovir 800 mg orally five times daily for 14 days for prophylactic coverage. As symptoms can occur up to 5 weeks post exposure, the ED team decided the benefits of antiviral prophylaxis outweighed the potential risks.

#### DISCUSSION

The herpes B virus (*Cercopithecine herpesvirus 1* commonly referred to as B virus) is a zoonotic agent that is endemic among only macaque monkeys (genus *Macaca*) but can cause fatal encephalomyelitis in humans



**Figure 1.** Patient's wound from monkey bite along left shoulder.



**Figure 2.** Macaque adult monkey in Ubud, Bali.

(1,2). Herpes B in the macaque mirrors herpes simplex virus in humans (3). The macaque typically suffers little to no morbidity from the herpes B infection and, only during active infection, the virus is found in buccal, conjunctival, or genital mucosa (4). One study found 97% of adult macaque monkeys in captivity were positive for herpes B (5). Rates of infection in the wild are documented at up to 70%; most are asymptomatic (6,7). Although recent published data are scant, existing literature shows no serologic evidence that humans can be asymptotically infected with herpes B outside of the incubation period (8). In humans, untreated herpes B virus is fatal at 80%, although in the age of antiviral herpes medications, mortality has dropped to 20% (9).

#### *Exposure and Transmission*

Most documented cases of macaque-induced herpes B infections in humans are from animals used in research (9,10). They are also kept as pets and found in the wild in Asia, northwest Africa, Florida, Texas, and Puerto Rico (1,11).

Contact with macaques in the wild is common. Although being bitten is the leading modality of contracting herpes B; scratches, bodily fluids, mucus mem-

brane, and even one reported case of human-to-human contact have been reported as modalities (9). The transmission rate is low, with 50 human cases reported from its discovery in 1932 until 2002 (9). Still, around 200 human exposures are documented by the National Institutes of Health monthly, and many more undocumented exposures are likely, emphasizing the rarity of transmission (1).

#### *Symptoms*

The incubation period in humans is 2 days to 5 weeks (9). Symptoms vary widely, but typically include vesicular herpetic lesions, nonspecific flu-like illness, lymphadenitis, peripheral nerve symptoms often near the site of inoculation (pain, numbness, itching), and symptoms in the central nervous systems (CNS), such as coordination or respiratory depression (9,12). Encephalitis marks the late stage of the disease.

Diagnostic testing includes enzyme-linked immunoassay, polymerase chain reaction (PCR), Western blot, and culture (13). PCR specificity and sensitivity is now listed at nearly 100% for serologic samples, although wound cultures are less reliable (14,15). Symptomatic patients should have testing performed.

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