

Cutaneous Anthrax of the lip: a Case Report in a 1 Year Old Infant



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ABSTRACT

..... Anthrax is a deadly, contagious bacterial infection. Skin anthrax is most frequent. Anthrax is a work-related illness, so it's rare among kids. Children's symptoms are similar to adults.

..... In this article, we introduce a one-year-old infant who developed cutaneous anthrax due to contact with contaminated broth with a sore on the corner of the lip. A 1-year-old infant from a village in Quchan, North-east Iran, with a swollen lesion with dark brown to black crust on its surface on the left side of upper lip presented to Akbar's Children Hospital, Mashhad, Iran, in January 2021. *Bacillus anthracis* was seen in direct smear of wounds with Gram staining though the sample culture result was negative. Mortality from cutaneous anthrax can be up to 20%. Therefore, timely use of antibiotics is quite effective in decreasing mortality and reducing the effects of bacterial spread in the blood.

Introduction

Anthrax is a zoonotic infection disease caused by the pathogenic bacterium *Bacillus anthracis* [1-4]. This disease is highly contagious and potentially fatal. Vegetarians are natural hosts [5]. Anthrax is a large, regular, aerobic, non-motile [6], and gram-positive bacterium. This bacterium has endospores and is therefore very

resistant [3,7]. Humans are the accidental hosts of the disease. The disease is transmitted to humans through contact with infected animals [5,8] or in contact with the carcass of an infected animal, as well as in contact with the products of an infected animal such as wool, meat, hair, and skin [4,8]. Three clinical forms of anthrax included: respiratory, cutaneous, and gastrointestinal [1,3]. The clinical form of the disease depends on how the bacteria enter the body. Bacteria enter the body through the skin, gastrointestinal tract,

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and inhalation [1]. Recently, another type of anthrax called injectable anthrax has been identified in Europe and among drug users [9]. Cutaneous anthrax usually enters through the skin. This type of anthrax is the most common type of anthrax, while it has the lowest mortality rate- about 1% with antibiotic therapy [1,9,10]. If left untreated, the mortality of cutaneous anthrax even could increase to 20% - 30% [9,10]. The incubation period of this disease is 2-7 days [8]. The clinical manifestations of cutaneous anthrax are well defined and include one or more relatively painless, irritable papules develop at site of inoculation. A bulla on a red edematous base soon follows. Then bulla ruptures and a hemorrhagic crust forms around which is a zone of erythema and edema in which several small vesicles may exist. The surrounding tissues are edematous, regional lymphatic glands maybe tender but lymphangitis is unusual. The sore is usually found on exposed skin such as the hands, arms, face, and neck. Seeing the clinical appearance, rapid course and lack of lymphangitis along with the patient's history of exposure to animals should suggest the diagnosis which must be confirmed by bacteriological examination [8,9,11]. In this article, we report the clinical and microbiological features of a cutaneous anthrax strain in a one-year-old infant.

Case Presentation : (January 2021)

A one-year-old infant with a necrotic and crusted wound with erythematous and edematous margins on the left side of upper lip without discharge was referred to Akbar Hospital clinic. In past medical history, the infant's mother mentioned that about two weeks ago, the child had an erosive lesion at the corner of her lip that she thought maybe due to a bitten lip. One week later, an ulcero- necrotic lesion

with erythematous and edematous margins was seen at the site of the wound (Figure 1). No discharge was noted but swelling developed around it. The infant had no significant medical or surgical history. The patient's history showed that she was in contact with livestock and lived in a native area of anthrax. On examination, the patient was conscious, critically normal, normal body temperature (37.2 °C), pulse 90 beats per minute and systolic blood pressure 95 mm Hg. On skin examination of the lip lesion, there was a painless ulcero- necrotic 1× 1.5 cm lesion with dark brown to black crust which had induration at the base and erythema and edema of surrounding tissues.

Laboratory examination showed that the number of leukocytes was 5000 / mm³. The patient was hospitalized. Other laboratory results were normal. Blood and tissue samples were used for culture. Because of past history of recent cutaneous leishmaniasis in infant's mother and also considering Mashhad city as an endemic area for cutaneous leishmaniasis, and because the ulcer was painless and relatively indurated at the base, and failure to respond to a course of oral cephalexin syrup with a diagnosis of streptococcal ecthyma, first direct skin smear for cutaneous leishmaniasis was done which was negative. Also wound sampling was performed with two sterile swabs. One swab was used for culture on blood agar medium and the other for smear preparation. The plate containing the sample was transferred to the incubator under aerobic conditions. The direct smear sample was stained with gram staining. The smear of the patient's wound discharge showed gram positive, square-ended rods (box-car shaped) in short chains (Figure 2). No bacterial growth was found in blood and tissue samples. The patient received ten days parenteral and oral clindamycin with complete recovery.



Fig. 1. View of the cutaneous anthrax on the baby's lips.

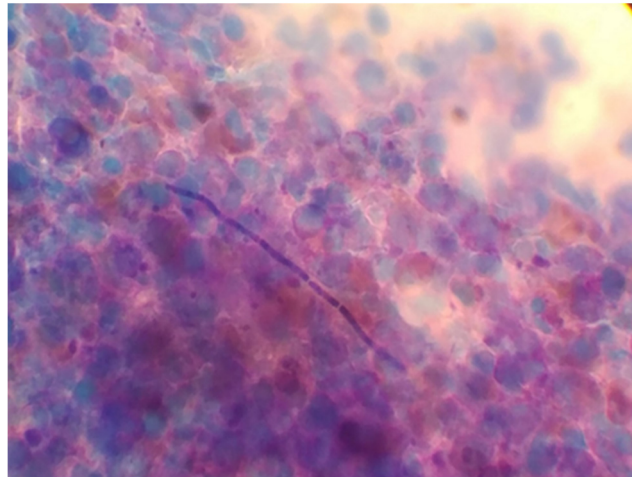


Fig. 2. The smear of the patient's wound discharge shows gram positive, square-ended rods (box-car shaped) in short chains.

Discussion

Anthrax is not a serious clinical problem in developed countries. In the United States, only 12 cases of skin anthrax have been reported in the last 20 years [12]. The disease is endemic in Asia, Africa, Central and Southern Europe [13]. Anthrax is usually an occupational disease and therefore less common in children than adults, and most of these reports are in rural areas of developing countries. The disease has been reported in infants, children and adolescents. In infants and young children, skin-to-skin contact is an important route of transmission. Its manifestations are similar to those of cutaneous anthrax in adults [14]. In our report, contaminated broth contact with a wound that previously existed in the corner of the baby's lip has caused infection and cutaneous anthrax.

More than 95% of anthrax infections worldwide are cutaneous anthrax [12] and more than 90% of lesions are found on the face, neck, arms and hands. The most common site of involvement is the hands and fingers (41%) [9]. In our patient, the lesion was on the face and upper lip. Anthrax naming is due to its typical anthrax scars. It can be difficult to diagnose cutaneous anthrax with unusual manifestations in non-native areas. Therefore, the patient's history of animal contact and painless black necrotic lesions and response to antibiotics confirms the diagnosis of cutaneous anthrax [9].

The gold standard for the diagnosis of anthrax is culture, but due to the use of antibiotics, culture is usually negative. Only 6% of cases are positive after the administration of antibiotics [15]. The infant introduced in this article was also negatively cultured,

but the direct smear was positive.

As mentioned, mortality from cutaneous anthrax can be up to 20%. Therefore, early detection and use of antibiotics is very important to reduce mortality. Antibiotic therapy prevents the spread of skin lesions and the spread of bacteria in the blood. Symptoms of systemic infection range from fever and leukocytosis and septic shock to meningitis and death if the bacteria spread to the blood [14].

Ethical Considerations

Data availability statement

The data used to support the findings of this study are available from the corresponding author upon request.

Compliance with ethical guidelines

There were no ethical considerations to be considered in this article.

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Conflict of Interests

The authors declare no financial and non-financial competing interests.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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