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CASE REPORT

Three eyelid localized cutaneous anthrax cases

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Abstract

Anthrax is primarily seen in the developing countries, but it can be a worldwide medical concern due to bioterrorism threats. Palpebral anthrax is a rare form of cutaneous anthrax. Untreated cutaneous anthrax can be lethal. Patients with palpebral anthrax can develop complications including cicatrisation and ectropion. Thus, anthrax should be considered in differential diagnosis for patients presenting with preseptal cellulitis in high-risk regions. Herein, we report three anthrax cases (with different age) involving eyelids that were cured without any complications due to early diagnosis and treatment.

Keywords

Anthrax, cutaneous, eyelid, preseptal cellulitis

History

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Introduction

Anthrax is a bacterial zoonotic infection transmitted to humans through contact with infected animals and their products. The agent of anthrax is the gram-positive, spore-forming bacillus, *Bacillus anthracis*[1]. Due to precautionary measures taken against the threat of anthrax in developed countries, the infection is not an important medical problem in these areas. However, it is still an important medical issue in developing countries[2]. There are three main types of anthrax: (1) cutaneous, (2) gastrointestinal and (3) respiratory-type anthrax[3]. More than 95% of anthrax cases are caused by cutaneous anthrax, which is mainly transmitted through contact with naked skin areas such as the face, neck and arms[4]. Eyelid anthrax, a subtype of cutaneous anthrax, is rarely seen, but it can cause serious complications that include cicatrisation and ectropion[1,5,6]. In this paper, we discuss three anthrax cases involving eyelids that were cured without any complications by early diagnosis and treatment.

Case 1

A two-year-old boy was brought to our clinic for swelling, redness and a wound over his left eye. He initially developed a small acne-like lesion on his left eyelid three days prior to the admission, before the lesion gradually enlarged and became a wound, causing eyelid swelling. One week before the onset of symptoms, his family was involved in an animal slaughter. The patient's medical and family histories were negative and the systemic examination was within normal limits. The dermatological examination showed extensive edema and erythema over the left eyelid – a brown-black colored crust 2×3 cm in size, and pale erythematosus-infiltrated edematous plaque (Figure 1). An ophthalmologic examination showed a normal anterior segment. Investigatory tests, which included a comprehensive metabolic panel, urine analysis and chest X-ray, yielded results within normal limits. The white cell count (13 700 cells/μl), sedimentation rate (35 mm/s) and C-reactive protein (CRP) (13 mg/l) were elevated. An orbital computer tomography showed soft tissue swelling in the left eyelid and left frontotemporal area and mucosal thickness in the left maxillary sinus. A smear taken from edge of the lesion was positive for gram-positive bacillus, although no culture growth was detected. The clinical and laboratory findings were consistent with cutaneous anthrax. The patient was treated with Penicillin G 200 000 IU/kg/day, Ibuprofen twice a day, and Oxytetracycline pomade twice a day for a total of 10 days. The lesions were completely regressed during the follow-up visit two months later.

Case 2

An eight-year-old girl was brought to our clinic for swelling, redness and a wound on her right eye. She initially developed a small acne-like lesion on the lower part of her eyelid, which caused swelling and redness four days prior to her visit to the clinic. The lesion soon enlarged and became a wound. She had contact with animals on her relative's farm six days before the onset of the lesion. A systemic examination was within normal limits. The dermatological examination showed extensive edema and erythema over the right upper

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Figure 1. A two-year old boy with dark eschar and extensive edema of the left upper eyelid.

Figure 2. Case 2, an 8 year-old girl. Extensive edema and hyperemia are present in the both eyelids of the right eye, and dark eschar of the right lower eyelid.

and lower eyelid: a brown-black colored crust 1×1 cm in size surrounded by pale, erythematosus-infiltrated edematous plaque, and periorbital edema together with purulent secretion, particularly from the right inner cantus (Figure 2). An ophthalmological examination showed a normal anterior and posterior segment of the right eye. Investigatory tests revealed normal results for a comprehensive metabolic panel, urine analysis, chest X-ray, sedimentation and CRP levels. The white cell count was elevated at 15 200 cells/µl. An orbital computer tomography showed soft tissue swelling around the right eyelid and left frontal areas. A smear taken from the edge of the lesion showed gram-positive bacillus. While no growth was detected in the culture, the patient lived in an endemic area for anthrax, and the clinical and laboratory findings were consistent with the infection. She was treated with Penicillin G 6×1.5, Ibuprofen 2×1 and Oxytetracycline pomade 2×1. The lesions regressed after 10 days of treatment and were completely regressed during the follow-up visit two months later.

Case 3

A 58-year-old male was admitted to our clinic after four days of right-eye swelling and redness. Erythematosus and itchy papule began on the right lower eyelid and gradually enlarged

Figure 3. A 58-year-old male with extensive anthrax edema and dark eschar on right eyelids.

and became surrounded by diffuse edema. He had slaughtered and skinned unvaccinated cattle. The patient's past medical and family histories were unremarkable and the systemic examination was within normal limits. The dermatological examination showed hyperemia and swelling over the right lower eyelid, particularly over the zygomatic bone and outer cantus level, featuring pale erythematosus-infiltrated edematous plaques 3.5×4 cm in size, sharp margin and a brown-black crust. In addition, there were two brown-black crusts on the right upper eyelid surrounded by a yellowish crust, measuring 2×1 cm and 1×0.5 cm in size respectively (Figure 3). An ophthalmological examination showed a normal anterior segment. Investigatory tests revealed normal results for a comprehensive metabolic panel, urine analysis, chest X-ray, sedimentation and CRP levels. The patient's white cell count was elevated at 16 000 cells/µl. An orbital computer tomography showed edema and thickening of subcutaneous soft tissues over the right lower eyelid. A smear taken from the edge of the lesion showed the presence of gram-positive bacillus, and culture tests yielded *Bacillus anthracis*. The clinical and laboratory findings were consistent with cutaneous anthrax. The patient was treated with Penicillin G 6×3 million unite and Oxytetracycline pomade 2×1 for seven days. The lesions were completely regressed during the follow-up three months later.

Discussion

Anthrax is a rare disease caused by *Bacillus anthracis*. The bacteria can be transmitted via inhalation, gastrointestinal tract and skin contact[7]. Anthrax cases have also been reported as a result of contamination among drug abusers[8]. While the disease is primarily seen in developing countries, it can also be a worldwide medical concern due to its use in bioterrorism threats[9]. Cutaneous anthrax can be transmitted via mechanic abrasion or fly bites that spread bacterial spore contamination[1,4,6]. More than 95% of anthrax cases in humans are of a cutaneous form. The mortality rate is around 20% without any antibiotic treatment and around 1% with antibiotic treatment[7].

In clinical presentation, cutaneous anthrax initially begins with small papule, before enlarging and becoming a vesicle within 24–48 hours. After the vesicle opens, a characteristic anthrax ulcer appears with a dark crust in the middle[10]. In the three cases discussed above, all the patients had an ulcer with a black crust during their hospital admissions. Cutaneous anthrax can be diagnosed by taking a detailed and careful family and medical history[4]. A patient's previous contact with animals and their products, as well as the presence of rapid progressive painless ulcer formation surrounded by edema, should bring to mind the possibility of an anthrax infection. Two of our patients had recent contact with animals and their products within the last 10 days, as well as a rapidly progressive crusted ulcer surrounded by edema. Anthrax can be diagnosed by detecting the agent with gram staining of a smear taken from the vesicles or ulcers and via culture growth. The culture positivity for anthrax is a maximum of 65%[1]. The agent in the above three cases was detected via gram staining and culture growth was only detected in one case.

In the case of eyelid anthrax, ulcers are mostly located on the upper eyelid[1]. However, two out of three of our patients had ulcers on the lower eyelid, and only one of them had an infection on the upper eyelid. Intense periorbital edema and preseptal cellulitis in early stage can be seen frequently in anthrax[1,2,5,6,10]. If the black crust that is characteristic of anthrax does not manifest within two weeks of the onset of the infection, preseptal cellulitis can be confused with other conditions such as erysipelas cellulitis, necrotizing cellulitis, primary syphilis chancre, orf and tularemia[11].

Penicillin is still the primary preferred treatment for anthrax[1,2,4,6]. Topical agents are not effective in the treatment and there is no consensus on the use of systemic corticosteroid treatment in anthrax cases[11]. Most of the palpebral anthrax cases can be treated successfully, but complications such as cicatrisation, ectropion and visible corneal scars may require reconstructive surgical procedures[1,5,10]. Our three cases were successfully treated with crystallized penicillin in the early stages of the disease without any complications. This is in accordance with the findings of Kayabas et al.[12], who showed that patients with anthrax were successfully treated with three to seven days of penicillin treatment. Topical agents were used to accelerate the crust's healing process. No complications were seen during a follow-up visit nine months later. Fortunately, our patients were diagnosed and treated by physicians who have experience in treating anthrax as it is frequently seen in our region.

The prevalence of anthrax has been declining, but it is still a medical issue in developing countries with predominant cultures of agriculture and animal husbandry, and it is also a worldwide issue due to its use in bioterrorism. Most of the anthrax cases are of the cutaneous type and eyelids are open area for contact transmission as well. In the presence of extensive preseptal cellulitis, the possibility of anthrax infection should be considered since early treatment can prevent possible complications.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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