Palbebral anthrax

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PURPOSE. *Anthrax is a rare infection transmitted to humans from animals or animal products. In cutaneous anthrax it may produce lesions of the eyelids which can lead to cicatricial ectropion.*
METHODS. *We examined three women and five men with anthrax of the eyelids. Intravenous penicillin G was used alone as therapy.*
RESULTS. *All patients presented with a localized itchy erythematous papule of the eyelid. A necrotising ulcer formed in each case, resulting in black eschar. The lesions resolved, with only mild cicatrization of the eyelid in all the patients.*
CONCLUSIONS. *Anthrax is primarily an infectious disease of domestic animals but it is also seen in humans. Eyelids are rarely affected but cutaneous anthrax should be considered in any patient with a painless ulcer or black eschar who has a history of exposure to animals. (Eur J Ophthalmol 2001; 11: 171-4)*

KEY WORDS. *Cutaneous anthrax, Eyelids, Black eschar, Cicatricial ectropion*

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INTRODUCTION

Anthrax is a very rare infectious disease caused by the Gram-positive sporing *Bacillus anthracis* (1). Anthrax is a zoonosis, the main reservoir of infection being domestic herbivores. The ultimate reservoir of *bacillus anthracis* is the soil, though the cycle of anthrax bacilli in soil is not completely understood. *Bacillus anthracis* spores are notoriously hardy and long-lived (2). Humans become infected when they come into contact with infected animals or their products (3). Human cases have been divided into two groups: agricultural or industrial (4). Agricultural cases of human anthrax result from direct contact with animals dying from anthrax. Industrial cases result from contact with anthrax spores that contaminate raw materials such as hides, goat hair, wool, and bones that are used as part of a manufacturing process (2-4).

We report a series of eight cases with anthrax of the eyelids and its complications.

METHODS

Diagnoses of anthrax of the eyelids in Elaziğ Fırat Medical Center and Military Hospital, and Erzurum Numune Hospital over a period of four years (1995 to 1998) were included in this study. Three of the cases were female and five male. Their ages were between 7 and 37 years (mean 16.5). All the cases were treated in hospital after a brief period when the symptoms were examined by an ophthalmologist. Ophthalmic evaluation included examination of the eyelids, anterior segment and fundus. All the patients had a history of contact with domestic animals. Scrapings of the lesions were Gram stained and cultured. All the cases presented prominent periortal edema, necrotic ulcer varying in severity in the affected side, and a black eschar appeared consequently (Figs. 1a-b, 2). The patients were given intravenous penicillin G immediately, using 12-24 million units/day, divided into 6 doses for 7 or 10 days. The main features are set out in Table I.

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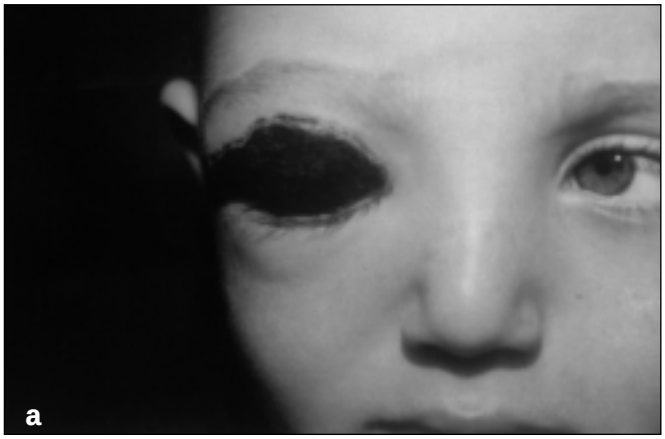

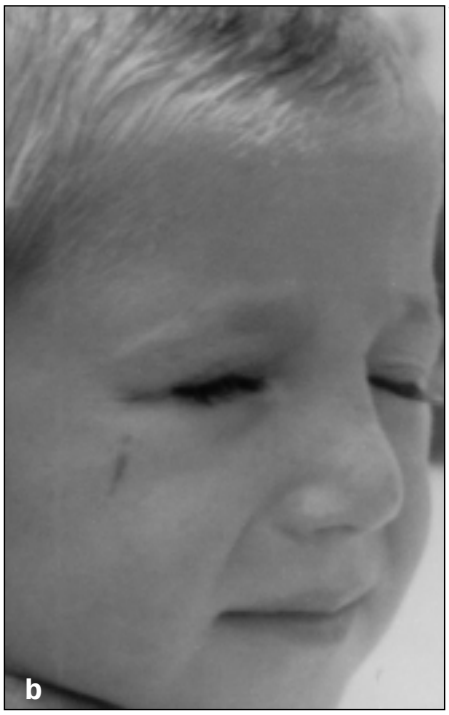

Fig. 1 - a. *A severe black eschar formation on the right upper eyelid in a patient with cutaneous anthrax (case 1).* **b.** *Mild cicatrization on the right upper eyelid of the same patient after treatment with systemic penicillin.*

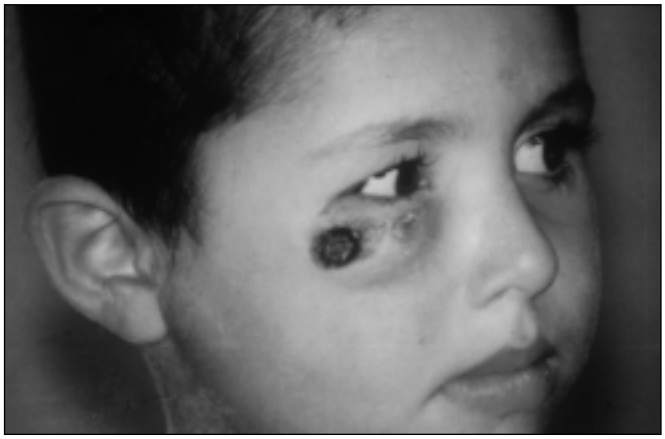

Fig. 2 - *Moderate eyelid edema with early eschar formation on the right lower eyelid in a patient with palpebral anthrax (case 8).*

RESULTS

Two of the cases presented with involvement of either the forehead or arm, besides the eyelids. Scrapings of the lesions revealed Gram positive rods and culture yielded *Bacillus anthracis* in some patients. In all the cases, a characteristic black eschar appeared in 7 or 10 days and with the resolution of edema, the plaque disappeared in two or three weeks. Healing with scar formation was observed in all cases. Three cases developed a mild ectropion but this cicatricial effect secondary to eyelid involvement did not require surgery. None of the cases were complicated by secondary infection or septicemia.

DISCUSSION

Anthrax in humans is a very rare disease caused by *Bacillus anthracis.* It occurs primarily in three

TABLE I - CLINICAL FEATURES OF PATIENTS WITH PALPEBRAL ANTHRAX

Case no.	Sex	Age, yrs	Lid involved	Mild ectropion
1	M	7	Right upper eyelid	No
2	F	9	Right upper eyelid	No
3	M	8	Left upper eyelid	Yes
4	F	37	Right lower eyelid	Yes
5	F	25	Right upper eyelid	No
6	M	30	Right upper and lower eyelids	Yes
7	M	8	Left upper eyelid	No
8	M	8	Right upper eyelid	No

forms: cutaneous, respiratory, and gastrointestinal (4). The incidence of anthrax has decreased in developed countries but it remains a considerable health problem in developing countries (5, 6). Humans become infected with this spore-forming bacterium when they come into contact with an infected animal. Our cases appeared to be agricultural infections as all those involved were farmers who gave histories of contact with domestic animals.

Cutaneous anthrax should be suspected when an individual describes a painless, pruritic papule, usually on an exposed part of the body. Vesicular fluid should reveal *Bacillus anthracis* organisms microscopically and on culture. In patients treated with antibiotics, the culture may yield negative results (2, 4). The differential diagnosis should include contagious pustular dematitis and staphylococcal pustule or carbuncle (4).

The clinical presentation of cutaneous anthrax is characteristic, and the diagnosis is not often missed. However because anthrax of the eyelids is so rare in Europe and the United States, sporadic cases are easily overlooked because the diagnosis often does not come to mind. Cutaneous anthrax accounts for more than 95 percent of cases (2). Over 90 percent of these are on exposed areas such as hands, arms, face, and neck (3, 5, 7). The infection begins as a small papule that is often pruritic. The papule enlarges and within 24-48 hours develops into an ulcer surrounded by vesicles (4). A characteristic black necrotic central eschar develops later, with edema (8). During the acute stage of these lesions, the edema is prominent and tends to spread over the face (9). After 1-2 weeks the lesion dries, and the eschar begins to loosen and shortly thereafter separates, leaving a permanent scar (5, 7, 8). Consequently, cicatrization of eyelids develop. Antibiotic therapy does not appear to change the natural progression of the lesion itself; however, it will limit or inhibit the development of edema and systemic symptoms (2, 4).

Intravenous penicillin G in high doses is still the first-line treatment, with a dose of approxiamtely 4 milion units q4-6h (2, 3, 10). Different forms of penicillin may be used as a drug of choice, depending on the severity of the diseases. Some cases resistant to penicillin have been reported (11). Lesions become culture-negative in a few hours but therapy should be continued for 7-10 days. For penicillin-allergic cases, erythromycin, tetracycline, or chloramphenicol is satisfactory. The antibiotic usually relieves or prevents systemic symptoms, but not the progression to eschar (4). Topical therapy is not effective. Excision of the lesion is contraindicated (2, 9). Systemic corticosteroids have been used for patients with extensive facial edema (12).

It is estimated that in approximately 20-30 percent of untreated patients cutaneous anthrax will cause death, and inhalation anthrax is almost always fatal (4, 13). Deaths are, however, rare after antibiotic treatment for cutaneous anthrax (2).

In cases with prominent cicatricial ectropion, excision of the black eschar, full-thickness skin grafting and reconstruction are all suggested (5, 14). None of our cases were complicated by ectropion leading to functional or esthetic problems so we did not plan to operate. Exophthalmos, optic atrophy and panophthalmitis have also been reported (5, 15).

Rarely, pulmonary infection follows inhalation of *Bacillus anthracis*, or gastrointestinal anthrax results from ingestion of the organism (2, 13, 16). Hemorrhagic meningitis and septicemia secondary to anthrax are two complications which are fortunately very infrequent but when they arise the clinical picture is severe and the prognosis is poor (17).

Palpebral anthrax is a rare disease but should be considered in the differential diagnosis of a painless papule or ulcers and black eschar of the eyelids, or preseptal cellulitis in a patient who has a history of exposure to animals.

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