

# Anthrax as a Rare Cause of Preseptal Cellulitis: Case Report

## Şarbon: Preseptal Sellülitin Nadir Bir Sebebi

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**ABSTRACT** Anthrax, caused by the spore-forming bacterium *Bacillus anthracis*, is rarely seen in industrial nations but is common in developing countries. In this case report, a 36-year-old male farmer who was diagnosed with preseptal cellulitis initially, was presented. Gram-positive rods were found in the microscopic examination of the scraped material obtained from the lower edge of the necrotic area. The patient was managed with high dose intravenous penicillin G. On the third day of treatment, edema began to decrease on the right eyelids. A patch of black necrotic eschar tissue developed on the whole surface of left eyelids. At the final examination of the case, six months after the completion of the treatment, the cutaneous lesion was healed without any eyelid pathology. Despite its rarity in developed parts of the world, anthrax should be considered in the differential diagnosis of preseptal and orbital cellulitis.

**Key Words:** Cellulitis; anthrax

**ÖZET** Spor oluşturan bakteri *Bacillus anthracis*'in neden olduğu şarbon, endüstriyel uluslarda nadiren görülür, ancak gelişen ülkelerde siktir. Bu olgu sunumunda, başlangıçta preseptal sellülit tanısı konmuş 36 yaşındaki erkek bir çiftçi sunulmaktadır. Nekrotik alan kenarının altından alınan kazıntı materyalinin mikroskopik incelemesinde Gram-pozitif çubuklar saptanmıştır. Hastaya yüksek doz penisilin G tedavisi kullanılmıştır. Tedavinin üçüncü gününde göz kapaklarındaki ödem azalmaya başlamıştır. Sol gözkapagının tüm yüzeyinde siyah nekrotik kabuk dokusu gelişmiştir. Tedavinin tamamlanmasından sonra altıncı aydaki son muayenesinde cilt lezyonu herhangi bir gözkapığı patolojisi oluşmadan iyileşmiştir. Dünyanın gelişmiş bölgelerinde nadir olmasına rağmen preseptal ve orbital sellülitin ayırıcı tanısında şarbon göz önünde tutulmalıdır.

**Anahtar Kelimeler:** Sellülit; şarbon

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**A**nthrax is a zoonosis, caused by *Bacillus anthracis*, which is a large, Gram positive, non-motile, spore producing bacterial organism. It mainly affects herbivora, but humans are occasionally affected. The spores of *Bacillus anthracis* are notoriously hardy and long-lived. They can resist temperatures of over 100°C for prolonged periods, and are resistant to drying. They can remain dormant but potentially infective for over 20 years. Tissue damage in the host is caused by a complex exotoxin which damages the capillary endothelium and causes inhibition of phagocytosis.<sup>1</sup>

Human anthrax cases are divided broadly into two groups: agricultural and industrial. Agricultural cases result from direct contact with animals

who are sick or have died from anthrax. *Bacillus anthracis* can also be transmitted by ingestion of raw meat, although this is rare. Anthrax manifests as different clinical forms, including cutaneous, gastrointestinal, or respiratory illness. More than 95% of all cases have cutaneous anthrax. It is estimated that approximately 20% of untreated cutaneous cases will result in death, whereas respiratory anthrax is almost always fatal. Although reliable data concerning gastrointestinal anthrax are not available, mortality exceeds 50%.<sup>2</sup>

After an incubation period of 1-12 days, cutaneous anthrax begins usually as a single, small, painless pruritic papule on an exposed area of the neck, head, or upper extremity. It enlarges, vesiculates, and is surrounded by a wide zone of erythematous, nonpitting edema. As the lesion evolves, the vesicle becomes hemorrhagic, necrotic, and covered by an eschar. The clue to diagnosis is the history and rapid development of a painless ulcer surrounded by a zone of edema. Usually, anthrax bacilli can be easily demonstrated on a Gram-stained smear obtained from the lesion.<sup>3</sup>

In this study, we report a case of anthrax that was initially diagnosed as preseptal cellulitis. In this case, typical black and necrotic eschar tissue which is characteristic of anthrax, developed on the eyelids. The cutaneous lesion healed without any eyelid pathology.

## CASE REPORT

A 36-year-old male farmer had redness and swelling on the upper and lower eyelids of his left eye, which began to develop three days before he admitted to our clinic. In his history he stated that the vesicles had begun to develop on the lesion since it first appeared. Preseptal cellulitis had been initially diagnosed in another clinic, and he had been treated with oral cefamezine for three days. He was referred to our clinic due to development of diffuse facial edema and necrotic tissue on left eyelids and fever. The patient did not have any systemic disease (diabetes mellitus, hypertension, etc.) trauma or substance abuse (alcohol, etc.). In the ophthalmic examination, bilateral upper and lower eyelids and face of the patient were edematous.

There was a necrotic, ulcerated lesion on left eyelids (Figure 1). Visual acuity and anterior and posterior segments could not be evaluated since the eyelids could not be opened because of diffuse edema. The patient's body temperature was 38.5 °C and his heart rate was 92 beats per minute, the white blood cell count was 20 600, and the C-reactive protein was 80.8 mg/L. Patient had a septic condition and did not have any pathologic findings in other examinations. The patient's chest X-ray was normal and in the computerized orbital-cranial tomography, left lateral side of face and eyelid was edematous. The department of infectious diseases confirmed the diagnosis clinically and bacteriologically. Gram-positive rods were found in the microscopic examination of the scraped material obtained from the lower edge of the necrotic area, however *Bacillus anthracis* was not present. Penicillin G, 18 million units per day was administered intravenously to the patient diagnosed with anthrax because of his clinical status and the Gram-positive rods that were seen in the microscopic examination. On the third day of treatment, right eyelid edema started to decrease. A patch of black necrotic eschar tissue developed and covered whole left eyelids (Figure 2). Best corrected visual acuity was 20/20 on right and left eyes. Bilaterally pterygium was seen on the anterior segment examination. Posterior segment was normal in both eyes. Antibiotic administration was continued for 10 days. At the end of the treatment, the lesion remained black and scabby with sharp edges at the same size. A follow-up examination was scheduled a week later at discharge. When he was brought to the hospital after one month, the scab had fallen spontaneously and granulation tissue had developed on the lesion (Figure 3). In his next follow up visit after six months, it was determined that no additional pathological signs had developed on the eyelids. The result was satisfactory both cosmetically and functionally (Figure 4).

## DISCUSSION

Anthrax disease is an acute infection caused by *Bacillus anthracis*. Cutaneous anthrax accounts for most of the cases of anthrax in humans.<sup>2</sup> The dis-



**FIGURE 1:** At the necrotic, ulcerated lesion on the left eyelids is accompanied by massive facial and eyelid edema.



**FIGURE 2:** The black necrotic eschar is present on the left eyelids 3 days after the beginning of the treatment.

ease is rarely seen industrial nations, however it is common in developing countries. Although cutaneous anthrax is rare in industrial nations, it became popular again due to terrorist attacks performed by mailing anthrax spores. Anthrax is commonly seen among farmers, butchers, veterinarians, shepherds and farm workers. Cutaneous anthrax contaminates individuals via open wounds or mucous membranes, however it cannot contaminate through healthy skin. Therefore, it should be considered in the differential diagnosis of eyelid and orbital infections of this population.<sup>4</sup> It has been reported that the eyelids were involved in all cases of anthrax if the patients were in close contact with livestock.<sup>5-7</sup> The typical history of close con-

tact with livestock and their products is very important in the diagnosis at the beginning of the disease.<sup>7</sup> Our case appeared to have an agricultural infection since the person involved was a farmer and had a history of contact with domestic animals.

Early diagnosis and treatment of anthrax is very important. As many as 10-20% untreated cases may be fatal, but the death rate can be reduced to less than 1% with appropriate antibiotic therapy.<sup>8</sup> High dose parenteral penicillin is the first choice for the treatment of anthrax. General improvement of the patient's condition and reduction in the edema within two to four days are the most important indicators of the efficacy of the treatment.<sup>9</sup> Brachman<sup>8</sup> stated that the lesion should not be operated on be-



**FIGURE 3:** One month after the completion of treatment, the scab had fallen spontaneously and granulation tissue had developed on the lesion.



**FIGURE 4:** View of the case six months after the completion of treatment.

cause surgery can cause the spread of the infection and worsening of the symptoms. Topical treatment is not effective, and the usefulness of corticosteroids is debatable.<sup>10</sup> Despite successful treatment, cicatrization is inevitable and its degree is related to the severity of the lesion. Çelebi et al.<sup>4</sup> reported that despite treatment of anthrax with high dose penicillin, a cicatricial ectropion eventually developed on the superior eyelid. Yorston and Foster<sup>5</sup> stated that cicatricial ectropion (eight patients) and corneal scars (three patients) were the main complications in 11 patients who were treated for periocular anthrax and there was much more ectropion when anthrax affected the upper eyelid when compared to the lower eyelid. Soysal et al.<sup>11</sup> reported a cicatricial ectropion developed on the lower eyelid in a patient who was treated with high doses of penicillin for

anthrax. Çaça et al.<sup>7</sup> presented three cases with cutaneous anthrax in the eyelids. They were treated with intravenous high dose penicillin. Cicatricial ectropion developed in two and corneal scar developed in one of them due to exposure keratopathy.<sup>7</sup> Sayouti et al.<sup>12</sup> presented a case with a similar progress. Our case had satisfactory results both functionally and cosmetically when compared to other results in the literature. It was determined that there was no pathologic finding in eyelid functions six months after the completion of treatment.

In conclusion, despite the rarity of anthrax in developed parts of the the world, cutaneous anthrax is still a reality in developing nations. Anthrax should be considered in the differential diagnosis of preseptal and orbital cellulitis.

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