



## Cases of cutaneous anthrax in eastern Turkey: The reports of three cases

Sevdegül Karadaş<sup>a</sup>, Hayriye Gönüllü<sup>\*</sup>, Mehmet Reşat Ceylan<sup>b</sup>, Fatih Esmer<sup>b</sup>, Senar Ebiñç<sup>c</sup>

<sup>a</sup>Department of Emergency Medicine, Faculty of Medicine, Yüzüncü Yıl University, Van, Turkey

<sup>b</sup>Department of Infectious Diseases, Faculty of Medicine, Yüzüncü Yıl University, Van, Turkey

<sup>c</sup>Department of Internal Medicine, Faculty of Medicine, Yüzüncü Yıl University, Van, Turkey

### ARTICLE INFO

### ABSTRACT

#### Article History

Received 27 / 12 / 2013

Accepted 09 / 06 / 2014

#### \* Correspondence to:

Hayriye Gönüllü

Department of Emergency Medicine,

Faculty of Medicine,

Yüzüncü Yıl University,

Van, Turkey

e-mail: drhayriyegonullu@gmail.com

#### Keywords:

Cutaneous anthrax

Emergency department

Frequency

Zoonotic disease

Anthrax is an acute disease caused by the bacterium *Bacillus anthracis*. This bacteria can form dormant endospores. When spores are inhaled, ingested, or come into contact with a skin lesion on a host, they may become reactivated multiply and rapidly. *B. anthracis* bacterial spores are soil-borne. Because of their long lifespan, spores are present globally and remain at the burial sites of animals killed by anthrax for many decades. Diseased animals can spread anthrax to humans, either by direct contact or by consumption of a diseased animal's flesh. The most frequent clinical type of anthrax is cutaneous anthrax. It presents as a boil-like skin lesion that eventually forms an ulcer with a black center (eschar). Cutaneous anthrax form often within the site of spore penetration between two and five days after exposure. Until the 20<sup>th</sup> century, anthrax infections killed thousands of animals and people worldwide each year. Animal vaccination programs and antibiotic therapy were decreased the number of deaths. But, anthrax is still a problem in less developed countries. It has been reported that the incidence of disease has decreased in Turkey. However, we present here in three cases of cutaneous anthrax admitted to the emergency department of our hospital within a week.

© 2015 OMU

### 1. Introduction

Anthrax is a zoonotic disease caused by the spore-forming bacteria *Bacillus anthracis* and it can persist in the soil for years (Lucey, 2005; Devrim et al., 2009). In developing countries anthrax is contracted by humans through exposure to infected animals or their contaminated products however, in developed countries industrial situation explain most of the cases (Lucey, 2005). It is known that person-to-person spread of anthrax is quite rare (Freedberg et al., 2003).

Anthrax usually occurs in farmers, butchers, veterinarians, shepherds, and farm workers in underdeveloped countries (Devrim et al., 2009). There are three clinical types of anthrax; cutaneous, gastrointestinal (GI) and inhalational. Cutaneous anthrax (CA) is the most common form (Meric et al., 2009). CA is diagnosed from the patient's history and the appearance of a painless ulcer which rapidly develops and is surrounded by a zone of edema. Definite diagnosis is confirmed by the isolation of bacteria from the infected ulcer or from a blood sample (Akdeniz et al., 2013). CA is generally

a local infection and the patient may recovery spontaneously (Baykam et al., 2009).

Despite the report that anthrax has decreased in Turkey; skin anthrax has become endemic in Turkey in recent years and in this paper we presented three patients who were diagnosed with CA in a week.

### 2. Case reports

**Case 1:** Case 1: A 31-year-old female patient at 20 weeks of pregnancy was admitted to department of emergency department (ED) with a black lesion on her right thumb (Fig. 1). This lesion had started as a small itchy acne. She was a housewife and had contact history with herbivorous animals. On admission to the hospital, her vital signs and other physical examination findings were normal. The patient recovered following intravenous antimicrobial therapy with intramuscular procaine penicillin G potassium 800.000/IU, 2x1 daily.



**Fig. 1.** Black lesion on the right thumb of the patient

**Case 2:** A 21-year-old male patient was admitted to emergency department (ED) with an itchy black ulcerated lesions on medial ventral area of the wrist of his left hand. His lesions had a marked edema, induration and a bulla with a central black area measuring 2x1cm (Fig. 2). He had no history of any known disease. He was a shepherd on admission to the hospital, his vital signs were stable and there were no remarkable results from his physical examination. He was diagnosed with cutaneous anthrax and referred to an infectious diseases clinic. He recovered following the administration of intramuscular procaine penicillin G potassium 800.000/IU, 2x1 daily.



**Fig. 2.** Marked edema, induration and a bulla with a central black area on the forearm

**Case 3:** A 40-year old male patient was referred to the ED with three bullous black and crusted black wound lesions on his left forearm which were surrounded by hyperemia (Fig. 3). He was a butcher. He had no history of any known disease. On admission to the hospital, his vital signs and the results of the physical examination were normal. No organism was seen in the Gram stain from the wound and no growth in the culture. Treatment was continued for ten days consisting of intramuscular procaine penicillin G potassium 800.000/IU, 2x1 daily and the patient recovered.



**Fig. 3.** Three bullous black and crusted black wound lesions on his left forearm

### 3. Discussion

Anthrax typically leads to disease in herbivorous animals. It is an endemic zoonosis for people in the Middle East, some Asian countries, Africa, and South America and it is an important health problem in eastern Turkey (Kayabas et al., 2012; Akdeniz et al., 2013). CA is generally the most common kind of the disease with transmission of the infection to humans generally being through contact with infected animals or contaminated animal products in Turkey (Kayabas et al., 2012). In this study, all of the presented cases had CA and they were admitted within a week to our ED.

The cutaneous anthrax lesions are usually seen on an exposed part of the body, generally on the face, neck, hands and arms. Mostly these lesions are single, but sometimes two or more lesions may occur. The lesion begins as a pruritic papule a vesicle develops within 1-2 days, and it is followed by a painless ulcer with a characteristic necrotic eschar in the center. The presence of a painless ulcer, an ulceration with hemorrhagic crust, and peripheral edema with induration together with satellite vesicles are major findings which lead to a diagnosis of anthrax (Akdeniz et al., 2013). In presented cases, a single lesion was present in cases 1 and 2 and three lesions in case 3. The lesions had painless ulcer and necrotic eschar in the center and were localized in the hand or forearm in all the cases.

Akdeniz et al. (2013) reported on a patient with CA having renal failure due to generalized tissue damage. Meric et al. (2009) presented a case of pneumonia secondary to GI anthrax. Ozcan et al. (2008) gave an evaluation of 23 CA patients in eastern Anatolia reporting that 95.7% of the patients had a history of close contact with sick cows or sheep. Their most frequent clinical findings were non pitting edema (100%), black eschar formation (100%), erythema (95.7%), malaise (52.1%), and fever (43.5%). In our three cases there were intimate contact, with an infected animal and their products such as meat. The most common clinically findings were skin lesions containing edema, induration, bulla and black eschar but with no systemic signs.

Anthrax covers a wide spectrum from asymptomatic to life-threatening situations such as sepsis and the disease can even cause death if not treated in the early stage. Fortunately, GI and inhalational anthrax which have a much higher mortality rate than CA are shown to be quite rare (Sirisanthana and Brown, 2003; Lucey, 2005). In cases of CA that are

treated, the mortality rate is lower than 1%. 10% CA can be self-limiting, and with treatment lesions can recover without complications in 80-90% of cases. For the treatment of CA the suggested treatment is a first-line therapeutic antimicrobial containing penicillin G (for 3-7 days) (Doganay et al., 2010). Our patients were treated early with penicillin G potassium or penicillin G procaine and the disease did not develop to a serious state and there were no complications.

Despite the report that the incidence of anthrax in Turkey has decreased (Akdeniz et al., 2013). This case report with CA show that anthrax remains an important problem in the country especially in the eastern part of Turkey. We think that this may be an indicator of an increase in cases with CA in Turkey. Also, early suspicion and appropriate antibiotic treatment can facilitate recovery and prevent the development of complications.

## REFERENCES

- Akdeniz, N., Calka, O., Ozkol, H.U., Akdeniz, H., 2013. Cutaneous anthrax resulting in renal failure with generalized tissue damage. *Cutan. Ocul. Toxicol.* 32, 327-329. doi: 10.3109/15569527.2013.768257.
- Baykam, N., Ergonul, O., Ulu, A., Eren, S., Celikbas, A., Eroglu, M., Dokuzoguz, B., 2009. Characteristics of cutaneous anthrax in Turkey. *J. Infect. Dev. Ctries.* 15, 599-603. doi:10.3855/jidc.551.
- Devrim, I., Kara, A., Tezer, H., Cengiz, A.B., Ceyhan, M., Seçmeer, G., 2009. Animal carcass and eyelid anthrax: A case report. *Turk J. Pediatr.* 51, 67-68.
- Doganay, M., Metan, G., Alp, E., 2010. A review of cutaneous anthrax and its outcome. *J. Infect. Public Health.* 3, 98-105. doi: 10.1016/j.jiph.2010.07.004
- Freedberg, I.M., Eisen, A.Z., Wolff, K., Austen, K.F., Goldsmith, L.A., Katz, S.I., 2003. Anthrax. In: Fitzpatrick's dermatology in general medicine. 6<sup>th</sup> ed. McGraw-Hill, pp, 1919-1921.
- Kayabas, U., Karahocagil, M.K., Ozkurt, Z., Metan, G., Parlak, E., Bayindir, Y., Kalkan, A., Akdeniz, H., Parlak, M., Simpson, A.J., Doganay, M., 2012. Naturally occurring Cutaneous Anthrax: Antibiotic treatment and outcome. *Chemotherapy.* 58, 34-43. doi: 10.1159/000335593.
- Lucey, D., 2005. *Bacillus anthracis (Anthrax)*. In: Mandell, G.L., Bennett, J.E., Dolin, R., editors. Principles and practice of infectious diseases. Philadelphia: Elsevier-Churchill Livingstone, pp, 2485-2493.
- Meric, M., Willke, A., Muezzinoglu, B., Karadenizli, A., Hosten, T., 2009. A case of pneumonia caused by Bacillus anthracis secondary to gastrointestinal anthrax. *Int. J. Infect. Dis.* 13, 456-458. doi: 10.1016/j.ijid.2008.12.008.
- Ozcan, H., Kayabas, U., Bayindir, Y., Bayraktar, M.R., Ay, S., 2008. Evaluation of 23 cutaneous anthrax patients in eastern Anatolia, Turkey: Diagnosis and risk factors. *Int. J. Dermatol.* 47, 1033-1037. doi: 10.1111/j.1365-4632.2008.03665.x.
- Sirisanthana, T., Brown, A.E., 2002. Anthrax of the gastrointestinal tract. *Emerg. Infect. Dis.* 8, 649-651. doi: 10.3201/eid0807.020062.