A Case of Cutaneous Anthrax Managed Operatively

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Citation

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Abstract

INTRODUCTION

Anthrax is very rare in developed countries. Its reported incidence is only 0.08 per 100,000 population per year in Australia [1]. It is unlikely that a doctor in developed world will ever encounter the disease, sporadic cases therefore may cause diagnostic difficulties. Cutaneous anthrax is endemic in the middle east and untreated has a mortality of 20% [2]. Although surgery has not been employed traditionally in the treatment of this disease (2), we report a sporadic case of Bacillus anthracis infection causing cutaneous anthrax which was treated by aggressive local debridement.

CASE REPORT

A twenty year old male laborer presented to the Accident and
Emergency Department with a painless papule surrounded by erythema
on the lateral aspect of his right thigh. He had noticed a small
blister the previous day from which he had expressed clear fluid.
On the day prior to presentation he had played in a rugby match.
The papule enlarged over the 24 hours since it was first noticed
and came to be associated with considerable swelling. He reported
no other symptoms and was constitutionally well.

On presentation he was apyrexial with normal vital signs. A papule of 5 mm in diameter with surrounding erythema was noted in
association with tender inguinal lymphadenopathy.

The patient was admitted to the hospital with the presumptive
diagnosis of an infected insect bite and was treated with oral Flucloxacillin.

The next morning he was unwell and febrile to 39 degrees. The
lesion was noted to have increased in size, to have developed surrounding vesicles and become painful. A swab was taken for
microscopy and culture. A diagnosis of cellulitis was made and IV
therapy with Flucloxacillin 1 g qid and Penicillin 1.2 g every 4
hours was commenced.

Over the next 24 hours he became progressively more unwell with
pyrexia to 40 degrees, however remained hemodynamically stable.
The initial papule progressed to a black eschar with induration,
erythema and edema extending over a 20 cm diameter (Figure1). Gram
positive bacilli were identified by microscopy and a Clostridial
infection was assumed. The patient underwent emergency debridement
of the lesion which was found to involve the subcutaneous fat
extending to but not including the deep fascia. A 20 x 15 cm elliptical excision of the affected area was carried out and samples sent for microbiological examination. Intravenous Flucloxacillin and Penicillin dosages were increased to 2 g qid
and 2.4 g every four hours respectively. Gentamicin 240 mg daily
was added and two sessions of hyperbaric oxygen therapy were
undertaken.

Figure 1

Figure 1 : The lesion in eschar phase



The patient's condition rapidly improved. A split skin graft was applied to the thigh defect on the eighth post operative day (Figure 2) at which time antibiotic therapy was ceased. The patient remains well.

Figure 2

Figure 2 : The lesion after surgical excision and skin grafting



At presentation erythrocyte sedimentation rate was 9 mm/hr and white cell count was 9.5 x 10 9/liter. The latter rose to a peak value of 12 x 10 9/liter during the admission and fell to 6.2 x 10 9/liter at discharge. Microbiological investigations demonstrated growth of a gram positive Bacillus from the wound swab taken at presentation, however no organisms were grown from the wound swab taken intraoperatively nor from the operative specimen. Bacillus anthracis was identified on day 11 of the admission.

DISCUSSION

Bacillus anthracis is of profound historical significance. It was the first bacteria recognized as pathogenic, the discovery of its life cycle by Koch led to the unimicrobial theory of infection and from it Pasteur developed the first attenuated vaccine [3].

Current interest in anthrax relates to biological warfare. The Bacillus was first used experimentally as a weapon during World War II on the Scottish island of Gruinard where it was so effective that it took until 1986 to disinfect the area using Formaldehyde and sea water. The aim of anthrax as a biological weapon is to generate the rapidly fatal pulmonary form of the disease.

Bacillus anthracis is a spore forming gram-positive organism which is often a soil commensal. Modern diagnosis is by polymerase chain reaction. Spores are introduced subcutaneously where they germinate and multiply. Subsequent production of an exotoxin is responsible for extensive local edema and tissue necrosis. Uncontrolled intravascular multiplication with fatal toxemia may result. Animal studies suggest that after the bacterial count reaches 10 million/ml antibiotic therapy is futile (3).

The manifestations of cutaneous anthrax are striking. The disease begins as a small, painless, often pruritic papule resulting from the inoculation of spores into exposed skin. The papule enlarges, develops vesicles and within two days ulcerates to form an eschar which is often referred to as a malignant pustule although the lesion does not contain pus. Edema develops which is disproportionate to the size of the lesion. If treatment is commenced with appropriate doses of Penicillin G (i.e. 20 million units per day) [4], most wounds become sterile within 24 hours. Even after prompt treatment the cutaneous lesion will continue to progress to the eschar phase. Occasionally the instigation of treatment precipitates a febrile reaction accompanied by a temporary increase in edema. Vaccination of high risk occupational groups is

recommended.

Surgical tampering or excision of the lesion should be avoided
as it may cause intensification of symptoms with possible spread
of the disease to the surrounding tissue.

In this case all risk factors for infection were investigated by the public health unit without identification of a definite source. It should be noted that it is possible for the disease to be transmitted by insects exposed to infected carcasses (2).

CONCLUSION

Anthrax is a serious, life threatening condition. Early microbiological identification is imperative in distinguishing it
from lesions which require surgery. Anthrax should enter the differential diagnosis of an extensive, rapidly progressive necrotic skin lesion. Early antimicrobial therapy will limit the
disease.

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