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Oropharyngeal anthrax*

by

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Abstract

The first bacteriologically confirmed case of oropharyngeal anthrax is described. A 59-year-old male patient presented with sore throat and extensive swelling of the neck and anterior chest wall five hours after the ingestion of uncooked water buffalo meat. Marked inflammation of the oropharynx and a small necrotic area in the left tonsil were found. Culture taken from this area grew *Bacillus anthracis*. In anthrax-susceptible areas, this acute illness should be added to the differential diagnoses of inflammatory lesion of the oropharynx with extensive neck swelling.

Human infection with *Bacillus anthracis* is usually manifested in one of three clinical forms: cutaneous, inhalational, or gastrointestinal. Septicaemia and meningitis may be complications of any of these (Brachman, 1977). A bacteriologically confirmed case of oropharyngeal anthrax has never been documented. In March and April 1982, anthrax in cattle and water buffaloes (*Bubalus bubalus*), as well as 52 cases of cutaneous anthrax in man, were recognized in Chiang Mai, Thailand (Sirisanthana *et al.*, 1984). During this outbreak, a case of oropharyngeal anthrax was diagnosed.

Case History

A 59-year-old previously healthy Thai male was admitted to Chiang Mai Hospital on 24 April 1982 with sore throat and neck swelling. The symptoms began five hours after ingestion of a local dish of raw water buffalo meat mixed with red pepper and other spices. The throat pain and neck swelling became rapidly more severe. He sought medical attention and was admitted about 18 hours after the onset of symptoms.

At the time of admission, the patient appeared weak and was in moderate distress. His blood pressure was 100/60 mm.Hg., pulse rate 86 per minute, respiratory rate 26 per minute and oral temperature 37.3 °C. There was an extensive area of non-pitting oedema over the left angle of mandible, neck, upper anterior chest wall and left axilla (Fig. 1). Several lymph nodes in the left upper deep cervical group were enlarged, each measuring two to three cm. in diameter. They were firm and slightly tender. Examination of the throat revealed marked inflammation of the soft palate, uvula, left anterior pillar of fauces and left tonsil. There was a small area of necrotic tissue at the upper pole of the left tonsil (Fig. 2). No sign of upper airway obstruction was detected. No cutaneous lesion was found and the rest of the physical examination was normal.

Laboratory data included a haematocrit of 45 per cent and a white blood cell count of 23,050 per cu.mm. with 83 per cent neutrophils and 17 per cent lymphocytes. A Gram stained smear from the lesion on the left tonsil showed many neutrophils and a few gram positive bacilli. Urinalysis and chest roentgenogram were normal. Culture taken from the lesion at the left tonsil grew *B. anthracis*. The patient was treated with two million units of penicillin G sodium intravenously every four hours. He died suddenly about 10 hours after admission. A postmortem examination was not permitted.

The organism isolated from the patient was identified as *B. anthracis* by its biochemical and cultural characteristics (Freeley *et al.*, 1974). An animal

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FIG. 1
Extensive oedema over left angle of mandible, neck and anterior chest wall.

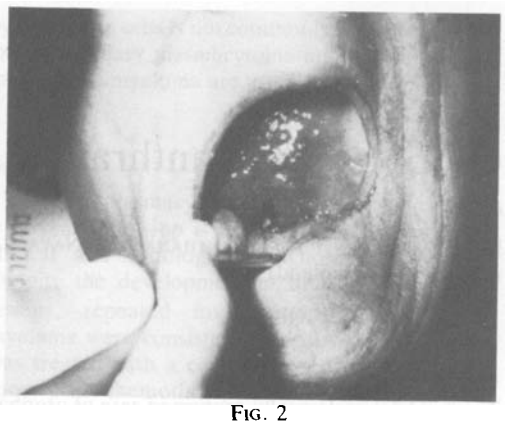


FIG. 2
Inflammation of soft palate, uvula, left anterior pillar and left tonsil.

pathogenicity test was also performed. Half a ml. of a saline suspension of the organisms containing 10^5 to 10^6 organisms per ml. was inoculated intraperitoneally in five white mice. All five died within 36 hours of inoculation. Cultures taken from liver, spleen and heart blood of the dead animals also grew *B. anthracis*.

Discussion

Anthrax can occur in most mammals, but is more common in cattle and sheep which acquire the infection by grazing in the area contaminated by *B. anthracis* spores. These animals, being highly susceptible to *B. anthracis*, develop septicaemia and die within one or two days. The massive proliferation of bacilli, which leads to overwhelming septicaemia in cattle and sheep, results in a quantity of the organisms sufficient to infect less susceptible mammals. These animals, which include swine, dog, cat and man, acquire the disease by exposure to a higher dose of *B. anthracis* spores from eating infected meat or contaminated feed (Blood and Henderson, 1974; Merchant and Barner, 1964; Smith, 1973). Man can be infected by two additional routes, skin inoculation and inhalation of the spores (Brachman, 1977). In swine, infection by *B. anthracis* is usually manifested by lesions localized to the pharynx and/or gastrointestinal tract (Blood and Henderson, 1974; Smith, 1973). Oropharyngeal anthrax in man has not been well described in the English medical literature. Brachman (1977) mentioned that primary anthrax of the pharynx has been described, but did not give any reference. Reporting a major epidemic of anthrax in Zimbabwe, Davies (1982) cited four cases each where lesions were on the tonsil and the tongue respectively, but did not give any detail. Our patient is the first documented case of oropharyngeal anthrax in man.

The final diagnosis in this patient was based on both bacteriologic and epidemiologic evidence. *B. anthracis* was grown from an inflammatory lesion in the oropharynx of a patient with a history of ingestion of uncooked water buffalo meat. In the same period, anthrax in cattle and water buffaloes, as well as 52 cases of cutaneous anthrax in man, were diagnosed in the same geographical area. In addition, 23 probable cases of oral and/or oropharyngeal anthrax were recognized in this same outbreak, before the presentation of our patient. These patients had similar inflammatory lesions in the oral cavity and/or oropharynx, neck swelling and a history of exposure to raw meat (Sirisanthana *et al.*, 1984). Bacteriologic documentation was lacking in these 23 patients.

Because of the epidemiologic evidence described above, our patient was thought to have oropharyngeal anthrax even before the result of the culture was known and, accordingly, was treated with penicillin. We can only speculate upon the

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cause of death. Unrecognized upper airway obstruction may have been responsible, despite the fact that the patient was under close observation. Alternatively death may occur secondary to a toxin from *B. anthracis*, possibly through its suppression of the respiratory centre (Klein *et al.*, 1968).

In anthrax susceptible areas, oropharyngeal anthrax, an acute and potentially fatal illness, should be added to those conditions such as diphtheria and peritonsillar abscess in the differential diagnosis of inflammatory lesion of the oropharynx with neck swelling. If suspected, an appropriate exposure history and bacteriological study can be obtained and the diagnosis can be readily made.

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