

## **The clinical case differential diagnosis of tertiary syphilis and anthrax**

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### **ABSTRACT**

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We conducted surveillance manifestations of tertiary syphilis – syphilitic gumma, which flows under the guise of anthrax carbuncle. We presented difficulties in diagnosis and differential diagnosis with a rare form of infectious disease – anthrax.

Clinical case is interested in dermatovenereologists, physician of infectious disease and all general practitioners.

**Key words:** syphiloma, anthrax, differential diagnosis.

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## INTRODUCTION

Anthrax (*anthrax* – from the English; *pustule maligna* – from the Latin; *anthrax carbon* – in French) – an acute infectious disease, mainly affecting the skin. Typical clinical signs include: localization in the head and neck, the presence of inflammation in the heart of the black crust, secondary elements in the periphery, swelling of the skin and subcutaneous fat, and lymphadenitis [1-6].

Syphiloma (*gumma syphilitica*) – deep syphilides that develops in the subcutaneous tissue in patients with tertiary syphilis. It characterized as follows: the rise above the skin, increasing in size, firm elastic consistency, painless, first mobility, and in the future – cohesion with the surrounding tissues, the color of pink, purple to black, clear boundaries. In the future, or dissolving syphilides opened. Usually solitary gumma, subjective feelings are insignificant [7-11].

**Own observation:** a 23-year-old woman was admitted to the Grodno Regional Infectious Diseases Hospital 1<sup>st</sup> November, 2004. The diagnosis at admission: anthrax?; third term birth in cephalic presentation; a defect of placenta, curettage of the uterine cavity, postpartum, and head lice.

**Complaints on admission:** the presence at the side of the neck, right, ulcers, crusted in black, a sensation of pressure in the defeat, weakness, headache, chills, sweating, and cough with mucous expectoration.

**History of the disease:** sick on October 20th, 2004, when increased body temperature, dry disturbed cough, runny nose, watery eyes. On October 28th at the side of the neck to the right, in the upper third spot appeared, which within days was transformed into a vesicle. The next day the body temperature also rose to 38°C. She took aspirin, and three times tried to remove the contents of the vesicle. On October 30, 2004 patients' condition deteriorated on the background temperature, there was swelling in the neck to the right, in place of the injured vesicles formed crust of black color with depressions in the center. Next day the patient came to stay with relatives in Grodno, where in a city apartment, there was the immediate delivery. A full term baby born with no outward signs of disease of newborns. A woman with a newborn baby was admitted to the obstetrics

department observational Emergency Hospital, Grodno, where in an objective examination of an ulcer was found crusted black, swelling of the right half of neck and other symptoms of the disease. A patient with a suspected anthrax infection immediately was transported to the Infectious Diseases Hospital.

**Epidemiological history:** she lives with her husband and two children in the village. The oldest child due to the mother's illness for a long time was staying in the city of Grodno. Her husband works on the farm. After the slaughter of animals brought home the head of the bulls in its raw form, with the wool. The last contact with the material the day before the onset of the disease. Boiled meat from the slaughtered animal's head eaten. Skin from the head of the killed animal was burned. October 26, 2004 in the skin, the angle of the mandible of a husband was a pathological element, resembling a boil, which he is self-treated. Currently, all family members are healthy.

**History of life:** the patient indicates that brought syphilis in 1999, points to the frequent change of sexual partners. The first pregnancy in 1999 ended in late miscarriage. Two subsequent pregnancies (2002, 2004) ended urgent delivery. Children are healthy. This was the fourth pregnancy.

**An objective examination:** the patient's condition at admission to the Hospital of Infectious Diseases assessed as moderate severity. The body temperature was 36.2°C. Consciousness was clear. Patient proper body building, reported weakness. She had pale skin. Peripheral lymph nodes were not enlarged. Pulse 85 per minute. Arterial pressure was 115/70mm Hg. Breathing was normal. She had been coughing periodically. The vesicular breathing was heard by auscultation.

**Status localis (Fig. 1):** in the right mastoid process of the skin is a key element in a carbuncle correct oval in the center of black crust 1 cm in diameter. Around the crust are whitish vesicles, and then congestion zone without clear boundaries, with a diameter of 2-3 cm. On the neck – a mild swelling, tenderness at the center of a dense, soft on the periphery was observed. Regional lymph nodes were enlarged, mobile, and painless.



**Figure 1.** Patient V, aged 23, syphilitic gumma.

**Laboratory data:** 11/01/2004, blood analysis revealed: red blood cells –  $2.8 \times 10^6/L$ , Hb – 96 g/L, platelets –  $142.8 \times 10^9/L$ , WBC –  $11.0 \times 10^9/L$ , eosinophils – 1%, stab leukocytes – 6%, segmented leukocytes – 60%, lymphocytes – 30%, monocytes – 3%, erythrocyte sedimentation rate – 50 mm/hour, toxic granulation of neutrophils – + + +. Biochemical blood analysis revealed: total bilirubin – 11.7 m/h/L, ALAT – 0.17 mmol/h/L, ASPAT – 0.66 mmol/h/L, amylase – 21.2 h/L, urea – 3.6 mg/dL, creatinine – 94 micromol/L, total protein – 54.0 g/L. Ionograms were normal.

**Preliminary clinical diagnosis:** cutaneous anthrax, moderate severity. Before the therapy, the material content of the vesicles for microscopy was taken. Culture was performed on meat-peptone broth. The treatment with penicillin in a daily dose of 12 million units, and gentamicin 80 mg intramuscularly, disintoxication and desensitizing therapy was introduced. Microscopic examination of clinical material for anthrax was negative.

On 11/01/2004, at 23.00 hours convened a consultation with infectious disease and dermatovenereologists. Findings of the panel: clinical data (acute onset, mild intoxication, the appearance of red spots in the angle of the mandible on the right transformed into a vesicle and then an ulcer, covered with thick black crust, and surrounded by dense infiltrate), epidemiological history (multiple contact with the animals and their wool and meat), not to rule out a skin form of anthrax.

It was recommended: further microscopic and bacteriological tests for anthrax, to continue penicillin administration, gentamicin

replaced with ciprofloxacin intravenously. The therapy was continued.

On 02/11/2004, at 8.00 received the final results of repeated sputum smear from the vesicles: the anthrax pathogen was not found. At 15.00 reconvened consultation with dermatovenereologists and infectious diseases physicians was conducted. Conclusion: in view of epidemiological data (no cases of anthrax in the area), the absence of clinical manifestations of infection in contacts, the clinical picture (dense infiltrate deep peel, the moderate intoxication), negative results of microscopy studies, the preliminary results of a negative bacteriological test suggest the presence of the patient vulgar ecthyma. It was recommended to continue treatment in the Grodno Regional Clinical Hospital of Infectious Diseases. Topical therapy included: treatment of 2% alcoholic solution of aniline dyes, and 2% cream sulfathiazole silver.

On 11/01/2004, it was carried out bacterioscopy native strokes separated vesicles – microbial cells in the visual field have not been diagnosed. On 02/11/2004, was placed on biological sample laboratory mice, and we observed the animals. On 04/11/2004, and 11/12/2004, the animals were killed on day 2. In 10 mice, pathological-anatomical changes characteristic of anthrax in smears of the organs of the microflora was not found. On 06/10/2004 held ELISA test for syphilis, the result – positive (titer 1.875), the 10/01/2004 – positive (titer 1.664). MRP for syphilis with inactivated serum from 04.11.2004, was negative. The chest radiography at 11/02/2004, revealed no apparent pulmonary infiltrative shadows in the basal zones of deformed pulmonary pictures, more to the left, the contours

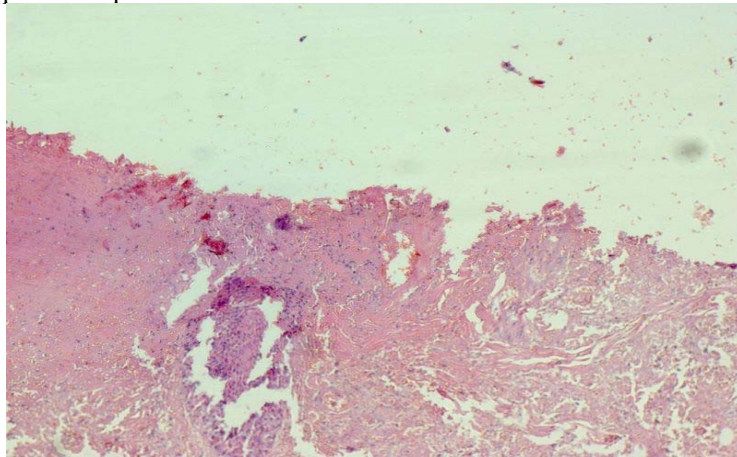
were distinct. Sinuses were free. Heart – waist smoothed.

The epidemiological, veterinary, clinical and laboratory results allowed to exclude the diagnosis of anthrax. Primary diagnosis was vulgar ecthyma.

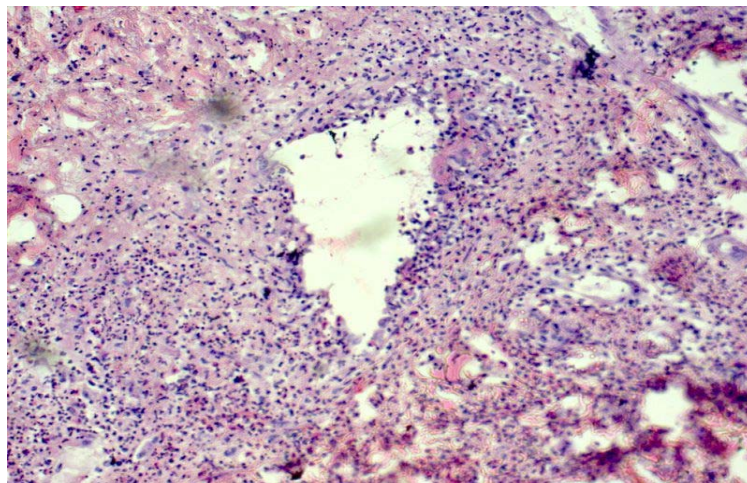
On 04/11/2004 at 12:00 o'clock the patient's condition deteriorated increased pain in the ulcers, decreased hearing in right ear, and increased fatigue. Within a day: increased edema, necrosis of the area - up to 1.5 cm, an increase in cervical lymph nodes was observed. At 16.30 the body temperature rose to 37.8 °C. Locally: asymmetry of the face due to swelling of soft tissues in the submandibular region and pozadichelyustnoy right were noted. In the center section of ecthyma necrosis 1.5 cm in diameter, skin hyperemic, swollen, painful was observed. The right sternocleidomastoid muscle had palpable small painful lymph nodes. Adjusted clinical diagnosis of ecthyma, gangrenous form.

Concomitant diagnosis of the late postpartum period; syphilis seropositive.

At 19.20 by the decision of the patient consultation translated to the Department of Oral and Maxillofacial Surgery, Grodno Regional Clinical Hospital. During next hours under intravenous anesthesia, it was removed necrotic area, made an incision in the whole amount of the infiltrate to be dense tissue, dissected. Once opened, discovered a cavity filled with necrotic tissue that was removed. Combined drainage; imposed aseptic bandage were applied. The tissue sample was removed and sent for histological examination. Macroscopically, a piece of skin 3.5x1, 8.0.5 cm in the presence of ulcers on the surface in black in diameter 1.2 cm was shown. Microscopically: the skin lesions included coagulation necrosis (Fig. 2) with the presence of vasculitis (Fig. 3), perifocal lymphocytic plasma cell, and neutrophil cell infiltration (Fig. 4). The inflammatory infiltrate extended to subcutaneous fat (Fig. 5). The stained sections of skin on the pale spirochetes of syphilis *Levaditi* not been identified.

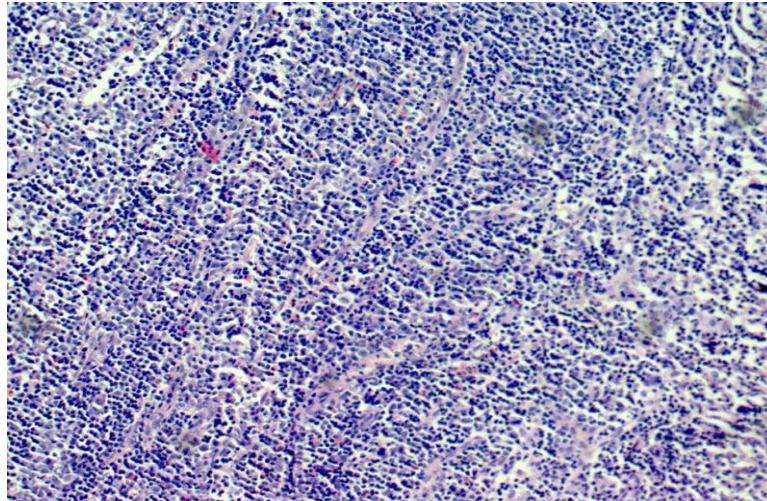


**Figure 2.** Coagulation necrosis of the skin, stained with hematoxylin-eosin.

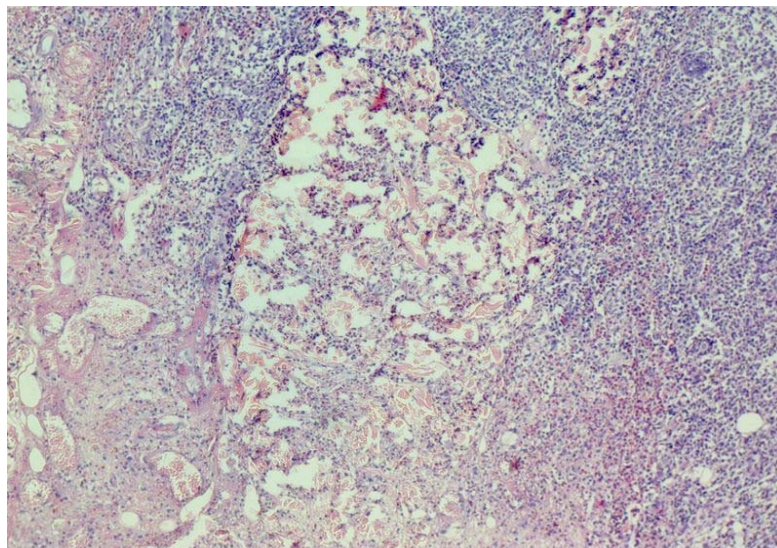


**Figure 3.** Exudative-destructive panangiitis in the dermis, stained with hematoxylin-eosin.





**Figure 4.** Plasma cell and lymphocytic infiltration at the edges and bottom of the ulcer, stained with hematoxylin-eosin.



**Figure 5.** Leukocyte infiltration of the dermis and subcutaneous tissue, stained with hematoxylin-eosin.

**Status localis:** 11/05/2004, moderately wet dressing of wound. It was observed decreased infiltration and edema. In palpation of the submandibular region, lateral to the right of the neck was painless. The wound with 3% hydrogen peroxide solution, and potassium permanganate with boric acid were treated. In smears of scrapings from the wounds, the elements of blood, fibrin, lymphocytes, and neutrophils in large numbers were detected. Atypical cells were not detected. From the wound *Staphylococcus aureus* was isolated. The general condition of the patient was stable. Complaints were not reported. The wound was not purulent. Cutaneous wound edges were moderately hyperemic.

On 08/11/2004, the general condition was satisfactory. Subjectively noted a significant

improvement. There was a slight soreness in the wound area. Edema and infiltration of the submandibular region and upper third of the neck to the right diminished. The antibiotic therapy was continued.

On 11/15/2004, the condition of the patient was satisfactory. No complaints were reported. Infiltration of surrounding tissue was diminished. The wound cleansed, palpation painless. The wound with 3% hydrogen peroxide, and bandage with a 1% solution Dimexidum.

After the patient refused treatment in the hospital the patient was discharged on the follow-up care in the polyclinic.

Complete blood count at the discharge: the red blood cells –  $3.75 \times 10^{12}/L$ , hemoglobin – 127.6 g/L, WBC –  $5.9 \times 10^9/L$ , eosinophils – 8%,

stab leukocytes – 14% segmented leukocytes – 35%, lymphocytes – 34%, monocytes – 9%, erythrocyte sedimentation rate – 63 mm/hour.

Diagnosis at the discharge: syphilis, tertiary (A52.9), serologically confirmed (A51.1) in 1999; syphiloma upper third of the neck to the right (A52.7) postoperative period; late postpartum period; anemia of mixed etiology.

## DISCUSSION

We analyzed the literature, but conclusive evidence of the need for differential diagnosis syphiloma and cutaneous anthrax has not been established. It should provide some differential diagnostic criteria for characterizing syphiloma and cutaneous form of anthrax. Syphilitic gumma - a site inflammation dense texture, red, often ulcerated, and in its place formed an ulcer, then a scar. Gummy ulcers are round with thick, towering edges. The characteristic clinical sign is a gummy stem - dirty-gray necrotic masses *raspolozhennyena* bottom ulcers. In order to establish a definitive diagnosis is necessary to serological diagnosis. Serological tests are positive in almost all cases of tertiary syphilis [1-6].

Infection with human anthrax comes from animals or from contaminated soil spores. At the site of entry of the pathogen formed serous-hemorrhagic inflammation with thrombosis of small veins. In the center of the affected area of skin necrosis is formed around it small vesicles with serous content. On the site of lesions initially formed red spot, then purple papule. A few hours later papule turns into a vial filled with hemorrhagic content. Vial is opened and from a crust. Lesion surrounded by a large area of edema, characterized by the emergence of local anesthesia. Cutaneous anthrax is accompanied by a severe general reaction: headaches, general malaise, high body temperature. In order to establish a definitive diagnosis is necessary to conduct laboratory tests: microscopy of pathological material to the color of Gram, inoculation of pathological material in meat-peptone broth or beef extract agar, holding a biological sample by infecting white mice or guinea pigs [7-11].

## CONCLUSION

Our observation suggests that the clinical manifestations of tertiary syphilis may be similar to cutaneous anthrax, and proof of the difficulties faced by the physician in the differential diagnosis of syphilitic gumma with cutaneous anthrax.

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