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Relapse of indurative tuberculosis of the skin of the lower extremities against the background of undiagnosed spontaneously cured pulmonary tuberculosis

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Abstract:

Introduction. In recent years, there has been a marked increase in the prevalence of cutaneous tuberculosis in Ukraine. Tuberculous lesions of the skin, as a rule, are secondary.

Case description. In recent years, there has been a notable rise in the prevalence of cutaneous tuberculosis in Ukraine. Tuberculous lesions of the skin are typically secondary in nature. Patient N, aged 58 years, presented with a dermatological complaint on the lower extremities, characterised by pruritus, burning and functional impairment, which affected their ability to wear clothes and shoes. He had been experiencing symptoms for approximately three years prior to seeking medical attention at his place of residence, where a diagnosis was not established. The objective data obtained from the research are as follows: The patient's overall condition is satisfactory. The subject presents with a normosthenic physique. The dermal lesions present as dense, rounded nodules up to 1.0 cm in diameter on the feet, lower legs, knees, and thighs. In some instances, these lesions merge with each other, forming solid foci. The skin in the vicinity of the nodes displays a reddish hue with a bluish tinge. Irregularly shaped foci of cicatricial atrophy are present on the skin of the ankle-foot joints. The remaining integuments are normal, with a pale pink appearance and no evidence of contamination. An X-ray examination of the chest organs has not been conducted for a period exceeding ten years. The disease is exacerbated by severe hypothermia. An additional rounded formation is identified on the X-ray of the thoracic organs and lungs, taken in both direct and left lateral projections. The pathohistological examination revealed uneven infiltration in the surface layers of the dermis, comprising lymphocytes, plasma cells, and multinucleated Langhans cells, which formed non-caseous granulomas. Additionally, the dermis exhibited focal sclerosis, granulomatous vasculitis with damage to the walls of small and medium-sized vessels, and signs of lobular panniculitis.

Discussion. In consideration of the patient's complaints, anamnesis data, data from objective and special research methods, a diagnosis was formulated. A relapse of indurative tuberculosis of the skin of the lower extremities was observed. The patient presented with

residual changes in a previously treated case of pulmonary tuberculosis. It is recommended that the patient be treated under the supervision of a phthisiologist.

Conclusions. Tuberculosis persists as a chronic infectious disease and social issue that continues to have a negative impact on global health. In order to facilitate an early diagnosis of tuberculosis of the skin, it is necessary to perform a mandatory X-ray examination of the organs of the chest cavity and a histological examination of the affected area of the skin at the initial visit.

Keywords: tuberculosis, indurative tuberculosis of the skin.

Introduction . In recent years, there has been a notable increase in the prevalence of tuberculosis in Ukraine, with a particular rise in cases of the cutaneous form of the disease. This is associated with delayed diagnosis, a reduction in childhood vaccination rates, a decline in general and sanitary culture, which is a consequence of a full-scale war, the lack of mass medical examinations and the resistance of the causative agent to antituberculosis drugs[1] .

Tuberculous lesions of the skin are typically secondary in origin. In other words, they manifest in the body, which has already sustained an impact from a preceding tuberculosis infection, in one form or another. The entry of Mycobacterium tuberculosis into the human body through the skin with the development of a primary tuberculous focus (the so-called tuberculous chancre) is observed with great rarity; only isolated cases of such impressions are described in world literature [2, 3] . In the majority of cases, Mycobacterium tuberculosis gains access to the human body via the respiratory tract, although this is a less common occurrence than the entry point via the digestive organs. Recently, there has been an increase in the number of patients presenting with disseminated forms of cutaneous tuberculosis, predominantly Bazen's indurative erythema. These cases arise as a consequence of hematogenous dissemination of tubercle bacilli in individuals with a high degree of allergy and reduced body resistance to tuberculosis infection [4, 5] . A delayed diagnosis of the indurative form of cutaneous tuberculosis results in only approximately 20% of patients being hospitalised at the initial presentation of the disease.

Subsequently, 17% present at the second exacerbation of the disease, and approximately 50% of patients consult a physician when the disease persists for more than two years, that is, after several repeated exacerbations of the disease. Only 30% of patients receive a diagnosis within the first six months of seeking medical attention, while an additional 40% are diagnosed after a two-year period [5-8] .

Case description . Patient N, aged 58, presented with a dermatological complaint affecting the lower extremities. The rash was pruritic, painful and interfered with the ability to wear clothes and shoes.

A review of the patient's life history revealed that the patient's father had died of pulmonary tuberculosis. From the anamnesis of the disease, it was determined that the patient had been experiencing symptoms for a period of three years. The patient reported seeking medical assistance and receiving treatment at his place of residence. However, the diagnosis was not established, and the treatment was only symptomatic, with no medical documentation available. The patient reported that an X-ray of the chest organs had not been performed for more than ten years. The most recent exacerbation occurred following a period of severe hypothermia. The diagnosis at referral was as follows: The diagnosis was hemorrhagic vasculitis. The form is ulcerative-necrotic. The objective research data are as follows: The patient's overall condition is satisfactory. The subject displays a normosthenic physique. The skin of the feet, lower legs, knee joints, and thighs display rashes of slightly painful, dense nodes of a rounded shape up to 1.0 cm in diameter. In some instances, these nodes merge with each other, forming solid foci. The skin in the vicinity of the nodes displays a reddish hue with a bluish tinge. Irregularly shaped foci of cicatricial atrophy have developed on the skin of the ankle-foot joints, occurring subsequent to the resolution of the rash and distorting the appearance of the skin. The aforementioned symptoms manifest in a symmetrical manner on the skin of the thighs, knee joints, ankles, and lower legs. The remaining integuments are observed to be normal, with a pale pink appearance and a clean surface (Fig. 1).

Fig. 1 Indurative tuberculosis of the skin of the lower extremities.

Palpation revealed no evidence of enlargement, mobility, or pain in the thyroid gland. There is no evidence of enlargement of the peripheral lymph nodes. There are no peripheral oedemas. The patient's neurological status is within the normal range. The patient's blood pressure was recorded as 140/80 mmHg. The pulse rate is 64 beats per minute, with a regular rhythm. The dimensions of the heart are within the normal range. The heart tones are rhythmic. The second tone is accentuated over the aorta. No audible sounds are present. Percussion over the lungs produces a clear lung sound and auscultatory hard breathing. The tongue is observed to be clean and moist. The abdomen is soft and painless. The liver is not enlarged, soft and elastic, and painless. Palpation of the spleen did not elicit a tangible response. The patient's neurological status is within the normal range.

The results of the special research methods are as follows: General blood analysis: haemoglobin 153 g/l, erythrocytes 4.37 T/l, colour indicator 1.05, leukocytes 7.3 G/l, platelets 131 G/l, ESR 52 mm/h, leukocyte formula p/yd. The value is 1% c/yd. The percentage of lymphocytes is 49%, while the percentage of monocytes is 42%. The percentage of eosinophils is 1%. The biochemical analysis of the blood revealed the following: The aspartate aminotransferase (AST) level was 40 units, the alanine aminotransferase (ALT) level was 55 units, the total bilirubin level was 12.2 μmol/L, the creatinine level was 63 μmol/L, the urea level was 5.2 mmol/L. The serum concentration of glucose was 3.0 mmol/l, while the concentration of total protein was 78 g/l. The serum concentration of amylase was 61 ul, while the concentration of GGT was 28 ul. The serum concentration of alkaline phosphatase was 68 ul, while the concentration of thymol was 1.24 units. The serum concentration of cholesterol was 3.60 mmol/l, while the concentration of triglycerides was

1.55 mmol/l. The concentration of high-density lipoprotein (HDL) was 1.50 mmol/l, while the concentration of low-density lipoprotein (LDL) was 2.0 mmol/l. A blood analysis was conducted to determine the presence of rheumatic factors. The patient's CRP, rheumatoid factor, and ASLO results were all negative. The serological test for syphilis yielded a negative result. An enzyme immunoassay was employed to detect antibodies to HIV in the blood sample. The results demonstrated the absence of antibodies to HIV. A blood analysis for markers of viral hepatitis revealed negative results for both HBsAg and anti- HCV. The general analysis of the urine sample revealed that it was completely transparent, had a low specific gravity, an acidic reaction, and the presence of glucose. However, no protein was detected, and the leukocyte count was between two and three per high power field. Additionally, the sample exhibited flat epithelium in the range of one to two per high power field, as well as a mucus score of three, indicating a high level of mucus. Oxalates and salts were also present in notable quantities. An X-ray of the chest was conducted. The X-ray of the organs of the chest and lungs in the direct and left lateral projections revealed additional rounded formations paravertebrally at the level of the eighth vertebra on the left, measuring 16 x 12 mm, and along the midclavicular line at the level of the anterior segment of the second rib on the left, measuring 14 x 11 mm, with clear, even contours. The roots of the lungs are compact. The sinuses are observed to be free. The domes of the diaphragm are discernible. The heart and aorta are within normal parameters.

Conclusions of the phthisiologist: The initial detection of tuberculomas in the left lung represents a noteworthy finding. Spiral computed tomography reveals that the lungs are in close proximity to the chest wall. In the superior segment of the upper lobe and the inferior segment of the lower lobe of the left lung, additional formations are observed. These are subpleural in location and measure 12 x 15 x 10 mm and 16 x 13 x 10 mm, respectively. They present with local central inclusions of lime and peripheral shell-like calcification with clear uneven contours. A single small calcification, measuring 2 mm, was observed in the lungs on the right. This was identified as a subpleural 2 mm nodule. Pleurodiaphragmatic adhesions are present in the left lung. The domes of the diaphragm are typically situated in the usual position, and there is no free fluid present within the pleural cavities. The mediastinal organs are not displaced. The trachea, main bronchi, and lobar and segmental bronchi are all freely passable. The specialist's conclusion regarding phthisis is as follows: The lungs display residual changes consistent with tuberculosis, manifesting as multiple tubercles on the left lung, small calcifications, and pleurodiaphragmatic mooring of the left lung.

A pathohistological examination of a skin flap was performed. A detailed description of the microscopic features is provided below: Histological examination of the skin revealed the presence of uneven infiltration in the superficial dermal layers, characterised by the accumulation of lymphocytes, plasma cells, and multinucleated Langhans cells, with the formation of non-caseous granulomas. No caseous necrosis is observed. The dermis displays evidence of focal sclerosis. The presence of granulomatous vasculitis, accompanied by damage to the walls of small and medium-sized vessels, and the emergence of signs indicative of lobular panniculitis, is more clearly discernible upon deeper examination. The pathohistological conclusion is as follows: The morphological picture is consistent with a diagnosis of vulgar (tuberculous) lupus of mycobacterial origin (Fig. 2).

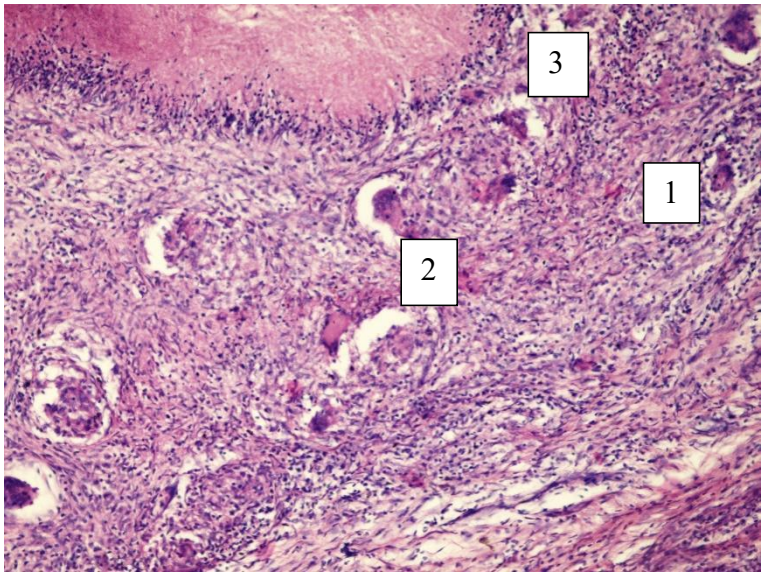

Fig. 2. Tuberculous granuloma. Hematoxylin-eosin staining, X 100.
1 – caseous necrosis; 2 – shaft of epithelioid cells; 3 – lymphoid shaft; 4 - numerous giant multinucleated cells of Langhans.

In consideration of the patient's complaints, life history, and illness data, objective and special data, research methods, the diagnosis was established. A relapse of indurative tuberculosis of the skin of the lower extremities was diagnosed. Destr – (without signs of destruction) ,MBT –(not confirmed by bacteriological examination), M – (negative result of the smear test for AFB), MG –(molecular genetic research), Rif 0 (Rifampicin resistance not studied). K 0 (cultural research was not conducted), Resist 0 (Resistance of BT to first-line drugs was not studied). Hist + (No. 1351 - 1358). The patient presents with residual changes of non-spontaneously cured tuberculosis in the form of multiple (two) tubercles of the left lung, small

calcifications, and pleurodiaphragmatic mooring of the left lung. It is recommended that the patient undergo treatment under the supervision of a phthisiologist, in accordance with the 2 HRZE/4 HR scheme.

Discussion. In recent years, there have been notable shifts in the clinical manifestations of a range of diseases, including those affecting the skin [9]. Additionally, there is a notable shift in the distribution of clinical manifestations and prevalence of cutaneous tuberculosis. Firstly, this can be attributed to a change in the causative agent of tuberculosis, namely Mycobacterium Koch, which has developed multi-resistance to antimicrobial agents. This has the effect of significantly complicating the treatment of this category of patients, as well as causing changes in the clinical course of the disease, which in turn complicates timely diagnosis. In the past, the most common forms of cutaneous tuberculosis were limited in their extent, with the most frequently observed manifestations being tuberculous lupus and colliquative tuberculosis of the skin. However, recent years have seen a notable shift in this trend, with Bazen's indurative erythema emerging as the most commonly diagnosed form of cutaneous tuberculosis in Ukraine and globally [10] . The disease is frequently observed in young individuals with diminished immune function, during hypothermia, in the spring and autumn. The lesion typically manifests on the lower legs and initially presents as small, single nodes that gradually increase in size and evolve into large, flattened nodules. The skin above the infiltrate is initially of a normal colour; however, it subsequently assumes a stagnant bluish hue. The nodes are characteristically bilateral, asymptomatic, and may persist for extended periods, even years, before fully resolving. Subsequently, pigmentation and slight atrophy are observed. The specific process in the lungs is observed to be weakly expressed, according to the chronic course of primary tuberculosis affecting the lymph nodes of the pulmonary roots. Specific intoxication phenomena are rarely observed [11] . It is a well-established fact that the nervous system and the skin have the same ectodermal origin. The risk of developing or exacerbating cutaneous tuberculosis is frequently observed in the context of prolonged psychotrauma, which can lead to depressive disorders. This observation is supported by a substantial body of clinical evidence [12] . In the case of our patient, the course of the disease was found to be consistent with the classic presentation. The patient's father had died of pulmonary tuberculosis, and the patient had not undergone a preventive examination for tuberculosis for a period exceeding ten years. For a period of three years, he sought medical attention for a dermatological condition affecting his lower extremities, characterised by burning and pruritus. The final diagnosis remained undetermined, and the patient was treated symptomatically, which yielded a prolonged and efficacious outcome. He

observed a worsening of the condition during the autumn and spring seasons, associating this with feelings of physical fatigue. The patient's overall condition remained stable throughout this period. However, following each exacerbation, there was an increase in pigmentation at the sites where the rashes had resolved. Following a period of prolonged exertion and overwork, the patient observed the emergence of numerous new rashes on the skin of the lower extremities. These were accompanied by burning, itching sensations and interfered with the ability to wear clothes and shoes. A meticulous anamnesis, objective examination, and data from supplementary methods collectively enabled the establishment of a diagnosis. It was recommended that the patient be referred to a physiatrist for further treatment, given the relapse of indurative tuberculosis of the skin of the lower extremities.

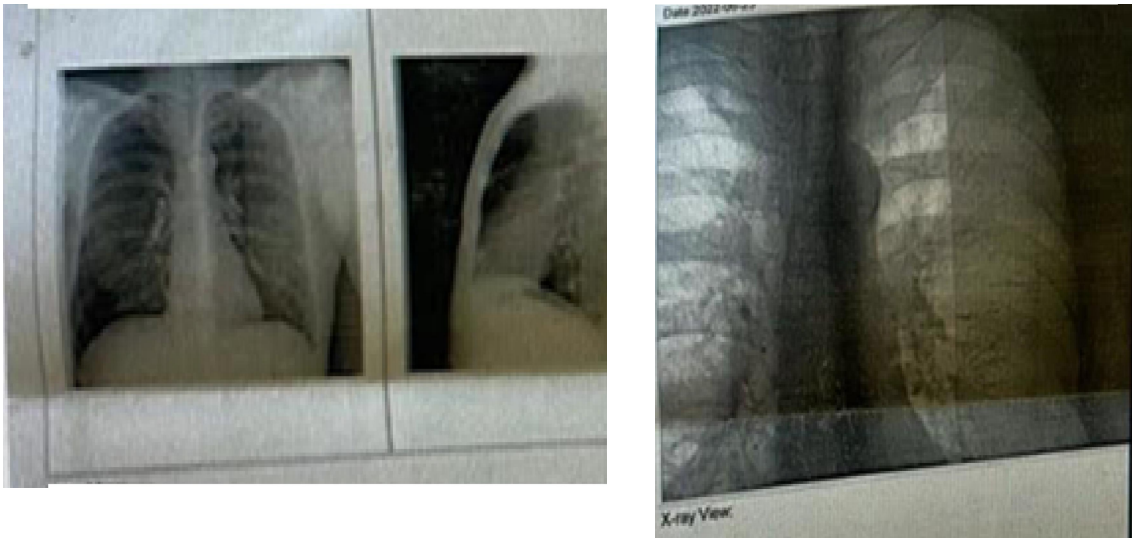

Fig. 3. X-ray of the organs of the chest cavity

Conclusions. Tuberculosis, a chronic infectious disease and social problem, continues to have a detrimental impact on human health. In order to facilitate an early diagnosis of tuberculosis of the skin, it is necessary to perform a mandatory chest X-ray examination and a histological examination of the affected skin area during the initial visit.

Author's contribution

Conceptualization Żanna Białoszycka, Monika Białoszycka, methodology, Alisa Pachevska, Żanna Białoszycka, software Monika Białoszycka, Alisa Pachevska, check Żanna Białoszycka, Monika Białoszycka, formal analysis Żanna Białoszycka, Alisa Pachevska, investigation Monika Białoszycka, Alisa Pachevska, resources Żanna Białoszycka, Monika Białoszycka, data curation Monika Białoszycka, Żanna Białoszycka

writing-rough preparation Żanna Białoszycka, Monika Białoszycka ,writing review and editing Żanna Białoszycka, Alisa Pachevska, visualization Żanna Białoszycka, Monika Białoszycka, supervision Żanna Białoszycka, Alisa Pachevska, project administration Żanna Białoszycka, Alisa Pachevska.

The authors have read and agreed with the published version of the manuscript

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The authors declare no conflict of interest.

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