Scrofuloderma of the Penis: Unveiling a Rare Case of Cutaneous Tuberculosis

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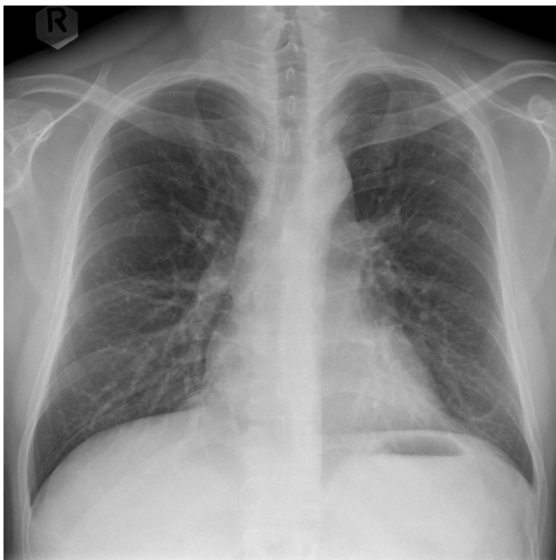

Figure 1. Thorax X-ray with increased echogenicity showing past tuberculosis infection.

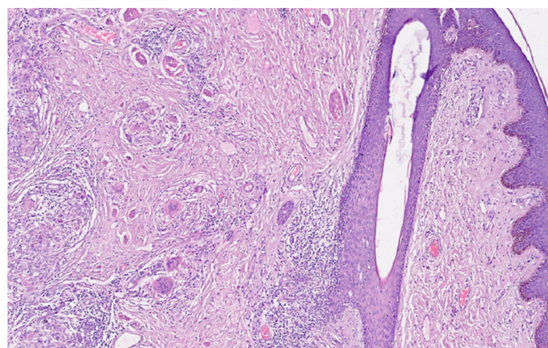

Figure 2. Normal tissue lined with epidermis. Tubercules with caseous necrosis can be found.

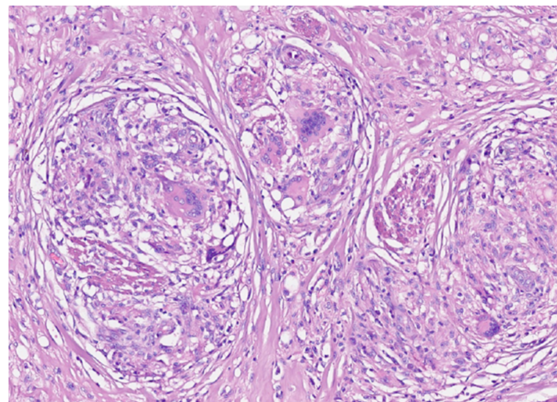

Figure 3. Datia Langhans cells can be found from the pathological examination.

Tuberculosis (TB) is a worldwide disease infecting 10.4 million people annually, where Indonesia, India, China, Pakistan, and the Philippines account for 56% of the cases.[1] Out of all the TB cases, 20% are extrapulmonary TB and 1-2% are cutaneous tuberculosis (CTS).[2] The most common clinical form of secondary CTS is scrofuloderma, which occurs due to the spreading of *M. tuberculosis bacilli* from organs under the skin such as lymph nodes, joints, tendons, synovial fluid, and bones.[3,4] Scrofuloderma initially presents as a deep, subcutaneous nodule filled with necrotic tissue and inflammatory exudates. This nodule can be unstable and eventually cause secondary ulceration and sinus tract formation, with

multiple ulcers potentially developing.[5] Lymph nodes are commonly involved, with the most common ones involved are cervical lymph nodes, and following it are axillary and inguinal groups of lymph nodes. The organism can be introduced through exogenous inoculation, via the hematogenous route, or by direct spread from underlying foci. Differential diagnosis related to scrofuloderma encompasses often bacterial abscesses, hidradenitis suppurativa, atypical mycobacteria, sporotrichosis, gummatous cutaneous syphilis, and actinomycosis.[6] The clinical presentation of cutaneous tuberculosis is influenced by the individual's immune status.[7] Here we report a rare case of cutaneous tuberculosis occurring in the penis.

A 36 year old man presented with complaints of an enlarged penis 4 days before going to the hospital. Vital signs showed that the body temperature was 36.5^{0}C, blood pressure was 119/94 mm Hg, heart rate was 86 beats/min, respiratory rate was 18 breaths/min, and oxygen saturation was 100%. Physical examination found an erythematous nodule with a necrotic ulcer around the preputial region of the penis, with a VAS scoring of 7 out of 10. The patient stated that he had a history of going to a shaman 1 year ago to inject his penis with oil to grow his penis bigger. The patient's medical record stated that the patient had a history of primary lung tuberculosis **(Figure 1)** and type 2 diabetes mellitus. There was no history of any urinary, or gastrointestinal symptoms. A general examination showed no obvious abnormalities.

Further laboratory testing revealed hemoglobin of 16.3 g/dL, leucocyte count of 6.06 x 10^3/uL with normal differential count, and platelet count of 269 x 10^3/uL. HbA1C in a patient was found to be 10.2% with random blood glucose 242 mg/dL. Sclero fibroma excision and penoscrotal flap of the penis was done to take a sample of the nodule. Histopathological examination showed tissue lined by epidermis without obvious abnormalities. tubercles with caseous necrosis, lymphocyte rolling, and Langhans giant cells are seen. congestive dilated blood vessels are also seen (**Figure 2** and **Figure 3**).

Serological testing for human immunodeficiency virus (HIV) was negative, but the interferon-gamma release assay (IGRA) test came back positive, supporting the diagnosis of scrofuloderma TB in the penis. The patient was started on four anti-tuberculosis treatment drugs, consisting of rifampicin, isoniazid, pyrazinamide, and ethambutol daily under Indonesia's National Guideline for Tuberculosis Management protocol. The patient was also given potassium diclofenac 50 mg p.o. o.d., pantoprazole 40 mg p.o. o.d., gentamicin 0.1% ointment, glimepiride 2 mg p.o. o.d., and metformin 500 mg p.o. o.d, vitamin B supplement daily to reduce the pain, control the blood glucose.

Clinically, scrofuloderma can be found in the neck, axillae, and groin as a firm subcutaneous nodule. Along with time, the nodule enlarges, softens, and forms confluence until ulcerates and forms draining sinus tracts of caseous material.[8] Despite being categorized as a multibacillary form, the oldest lesions may be paucibacillary, and the tuberculin skin test is typically very reactive.[6] In this case, our patient presented with an erythematous nodule with a necrotic ulcer, similar to findings from Soeroso et al., Mello et al., Rahangdale et al., and Ueno et al. However, we found this nodule in an infrequent area, which is around the preputial region of the penis.[4,6,9] Cutaneous scrofuloderma can occur anywhere, but the prevalence of it happening in the penis is undeniably rare.

It is challenging to establish the diagnosis of cutaneous tuberculosis. Proper history taking, physical examination, microbiological and molecular examinations, and histopathological examination are usually done. However, microbiological and molecular examinations may yield a negative result. Hence, histopathological examinations are needed to establish the correct diagnosis.[10] Histopathologically, a scrofuloderma usually shows caseous necrosis and granuloma formation, consistent with our findings.[11]

The diagnosis of cutaneous TB in this patient is also supported by his history, where he has done a procedure involving needles that penetrate through his penis, providing a route for bacterial transmission. Usually, acid-fast bacilli is incapable of penetrating a normal skin barrier and some form of injury such as skin abrasion,

wounds, impetigo, or even a surgical procedure is required to initiate the infection.[2,11] Therefore, the differential diagnosis in this patient includes both exogenous and endogenous cutaneous TB. However, based on existing evidence and existing epidemiological data, scrofuloderma is our main diagnosis in this case.

Our patient also has a history of type 2 diabetes mellitus. Studies have reported that immunodeficiency is one of the main causes of skin tuberculosis. Therefore, patients with immune deficiency such as uncontrolled diabetes possess a greater risk of developing cutaneous tuberculosis.[3] Chronic hyperglycemia altered immunity, both adaptive and innate. This condition impairs the activity of alveolar macrophages, monocyte chemotactic migration, and neutrophil recruitment. In addition, altered pulmonary microvasculature and vitamin deficiencies aid in the invasion and establishment of tuberculosis, thus making those with diabetes more susceptible to TB infection.[12]

CONCLUSION

This case illustrates the unusual presentation of scrofuloderma in the penile region, highlighting the diverse manifestations of cutaneous tuberculosis. Diagnosis of cutaneous TB demands a comprehensive approach, encompassing thorough history taking, physical examination, and histopathological analysis, especially in atypical cases where microbiological and molecular tests may yield negative results. The patient's history of penile penetration provides a potential route for bacterial transmission, supporting the diagnosis of scrofuloderma. Additionally, the presence of type 2 diabetes mellitus complicates the case, as immunodeficiency associated with diabetes increases the risk of cutaneous TB.

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