



## CASE STUDY

# Registration of the First Case Study in Cyprus of a Critically Ill Patient with Tuberculosis and Simultaneous Infection with Mycobacterium Soft Tissue on the Medial Surface of the Thighs

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## Abstract

The first critically ill case with medial soft tissue tuberculosis is recorded for the first time in Cyprus. She is a young patient with a rich medical history. Tuberculosis was detected in the soft tissues of the medial degree in the Intensive Care Unit of the Nicosia General Hospital. The purpose of this specific study is to record and analyze the first clinical case in Cyprus of a critically ill patient with tuberculosis and simultaneous infection with Mycobacterium soft tissue on the medial surface of the thighs. For the publication of this study, a consent form was obtained from the patient herself. The patient survived and was discharged from the Intensive Care Unit to another part of the hospital and was subsequently discharged from the hospital in general.

## Keywords

TB, Mycobacterium, ICU, Soft tissue, Critically ill

Among 10 million TB cases estimated worldwide by WHO in 2019 [1], extrapulmonary localization accounts for 16% and CTB (skin and soft tissue infection) less than 2% of all extrapulmonary cases [1,2].

Tuberculosis is a chronic bacterial infection caused by *Mycobacterium tuberculosis*. This chronic infection is one of the major causes of morbidity and mortality in the world [1]. The incidence of tuberculosis is equal in men and women. Advances in TB treatment have reduced the incidence of TB, but the infection remains a major health problem worldwide [2,3]. The prevalence of the disease has increased with the increase in the population of immunosuppressed patients (especially AIDS patients) in recent decades [1,4,5]. The lungs are the most common sites of TB involvement, but other extrapulmonary organs can also be infected [1,2,4,6]. Cutaneous tuberculosis is a rare form of extrapulmonary involvement [5,7]. The clinical presentation of different types of cutaneous tuberculosis varies and is determined by factors such as the route of infection and the cellular immune status of the host [8]. Cold sores are one of the skin and soft tissue infections. Tuberculosis cold abscesses usually occur in immunocompromised patients [1,5].

The purpose of this specific study is to record and analyze the first clinical case in Cyprus of a critically ill patient with tuberculosis and simultaneous infection

## Background

The genus *Mycobacterium*, the only entity in the family *Mycobacteriaceae* (order *Actinomycetales*, phylum *Actinobacteria*), consists of a distinct group of aerobic, non-motile, non-spore-forming, Gram-positive bacilli. They are characterized by a slow growth rate and a high content of mycolic acids within the cell wall, which makes them resistant to alcohol and acid washing. Skin and soft tissue infection (SSTI) from *Mycobacterium tuberculosis* complex is rare, but remains a potential threat in developing regions.



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**Table 1:** Patient comorbidities.

1. Rheumatoid arthritis treated with methotrexate, cortisone and possibly reduxima
2. Lung exfoliation before year for trapped lung and empyema
3. 2017-2018 received anti TNF 2-3 doses
4. In the winter of 2018, she was hospitalized for a respiratory infection, some nodules are visualized and tuberculosis is suspected, she does BALL which was negative.
5. In May 2018 she receives Rituximab
6. In September 2018, she developed a pleural effusion, a lung exfoliation was performed and the culture was negative, but ADA was high.
7. Since the beginning of 2019, her clinical picture was not good, she had diarrhea and frequent infections.
8. A smoker

**Table 2:** Wound recording based on the Cubbin Jackson risk assessment scale.

Image Number	Body position the wound	Type of wound	Condition	It was used
Image 1 + 2 (6/9/19)	Right inner thigh Left inner thigh	abscess	Right: Necrotic tissues, wet, purulent splint Left: Moist and purulent splint.	Betadine, N/S 0.9%
Image 3 + 4 (12/9/19)	Right inner thigh Left inner thigh	abscess	Right: Necrotic tissues, wet, purulent splint Left: Moist and purulent splint.	Betadine, N/S 0.9%
Image 5 (18/11/19)	Right inner thigh Left inner thigh	Right inner thigh: Granular tissue Left inner thigh: Granular tissue with small spots of marshy necrosis	Right: Exudate, Serous Left: Exudation, Bloody	Right and Left: Washing with an antiseptic solution, rinsing with saline and placing an alginate pad

with Mycobacterium soft tissue on the medial surface of the thighs. For the publication of this study, a consent form was obtained from the patient herself.

## Case Presentation

She was hospitalized in a Larnaca General Hospital of Cyprus since 22/8/19 due to fatigue, weakness and spondylodiscitis O<sub>2</sub>-O<sub>3</sub> and soft tissue infection on the medial surface of the thighs. In the course of her hospitalization, her breathing worsened and she was transferred on 5/9/19 and placed on non-invasive respiratory mechanical ventilation at the Nicosia General Hospital. On 4/9/19, an OMSS MRI was performed without differentiation from the previous pelvis - hips MRI, where no inflammatory changes were observed in the soft tissues and the controlled bone structures. Swelling is noted in the medial and minor gluteal muscles bilaterally, especially in the adductor muscles. On admission to the Intensive Care Unit the patient appeared to be communicating but was lethargic with severe respiratory distress. She had 40 breaths per minute. She was then intubated and given a small dose of noradrenaline. It carries a right subclavian central venous line. Pan cultures were obtained. Her medication continues with meropenem i.v. and vancomycin i.v. A surgical assessment was requested as the clinical examination showed palpable inflamed masses in the adductors and thighs, possibly an abscess. [Table 1](#) shows the patient's comorbidities.

The Cubbin Jackson decubitus risk assessment scale ([Table 2](#), [Table 3](#), [Figure 1](#), [Figure 2](#), [Figure 3](#), [Figure 4](#) and [Figure 5](#)) was used to record the patient's abscesses. Below is the record and assessment and medical and nursing care required for the patient's soft tissue abscesses.

## Discussion

Diagnostic features of extrapulmonary tuberculosis include: chronic lymphadenopathy, pleural effusion and thickening, chronic monoarthritis and spondylodiscitis, and immunosuppressive disease (HIV+) [5,6,9]. Diagnosis is usually difficult and elusive [4]. Lymph nodes, pleura, pericardium, central nervous system, urinary and musculoskeletal systems, and skin-soft tissues are the most common sites of extrapulmonary tuberculosis [1,2,4,6].

Soft tissue involvement is a rare form of Mycobacterium tuberculosis infections (1%-2%) [5,7]. However, the detection of *Mycobacterium tuberculosis* is always an important part of the differential diagnosis of soft tissue involvement in endemic areas [9]. A cold abscess is an unusual form of cutaneous tuberculosis that may be single or multiple and with or without a fistula. These abscesses are usually multilobular and occur in immunocompromised patients [1,5]. In addition, cold abscesses do not involve toxic symptoms and cause minimal inflammation [10].

**Table 3:** Timeline of patient hospitalization.

Days	Interventions	Results
6/9/19	Assessed by surgeons and adduct abscesses were opened, swabs were taken for culture (Figure 1 and Figure 2)	Dead bodies were removed and instructions were given for daily changes. A buttock biopsy was taken for culture by the surgeons.
6/9/19	Bronchoscopy	BAL was obtained for PCR, Aspergillus, common, fungal, virological, cytological and AFBs. Patient intubated under sedation with propofol 20 ml/h - fentanyl 10 ml/h. edematous bronchitic mucosa with several whitish secretions was detected. Free stomata up to subsegmentals.
6/9/19	The patient in ac mode on the ventilator regarding low oxygen needs.	It revealed bilateral diffuse micro-nodular infiltrates in all lung fields. Viral panel, brucella test to vet services and immune check was sent.
6/9/19	CXR	
6/9/19	Lasix QID to optimize diuresis and started clindamycin for possible granulomatous toxins.	From the cardiovascular system, noradrenaline requirements remained low with sinus tachycardia and positive balance.
10/9/19		<ol style="list-style-type: none"> <li>1. Buttock tissue 6/9/19: direct positive +3 for acid fast bacilli, PCR positive for TB, (S) on rifampicin</li> <li>2. BAL: immediate negative for acid fast bacilli, positive PCR for TB, (S) rifampicin</li> <li>3. Culture for common microbes from thigh tissue left: No growth</li> <li>4. Stop antibiotics for common germs</li> </ol>
13/9/19	<p>She is still not waking up, she received continuous administration of midazolam until 10/9/19 with creatinine clearance very low.</p> <p>she shows satisfactory diuresis with continuous administration of furosemide</p> <p>respiratorily, she has little need for a ventilator and does not need the administration of vasoconstrictors.</p>	It most likely has a build-up in fat.
16/9/19	Abscesses on the thighs are often surgically cleaned with removal of necromata (Figure 3 and Figure 4)	had the dose of enoxaparin reduced due to decreased creatinine clearance and bleeding from the oral and nasal mucosa. She also had petechiae on the chest and abdomen.
17/9/19	During the clinical examination she opened her eyes to her name so the Glasgow scale from 3/15 became 5/15.	
18/9/19	a chest X-ray was done and you present improved. worsening renal function had satisfactory diuresis with high doses of furosemide. Creatinine has plateaued at 5.5. With IV furosemide he had a negative balance every day.	
19/9/19	<p>Episode of desaturation and difficulty breathing. She had bloody discharge with duct obstruction. blood products were replenished and desmopressin was administered.</p> <p>a ductal catheter was placed.</p>	<p>She started hemodialysis because even though she urinates, she doesn't do good dialysis, it raises urea and phosphorus.</p> <p>A percutaneous tracheostomy was performed</p> <p>AC mode with FiO<sub>2</sub> 45% (18/9/19 until 100%) and relatively good gas exchange.</p> <p>Respiratory wheeze: Bilateral roughness, significant decrease in right APS. Repeat chest X-ray with base thickening almost right</p> <p>Feverless</p>
20/9/19	She completed 2 weeks of antituberculosis treatment and a sample of bronchial and abscess samples was sent for acid fast testing.	<p>Due to a septic condition, the antibiotic treatment was escalated with the addition of tazobactam/piperacillin, vancomycin. Fresh bronchial secretions and tissue samples were obtained to check the success of antituberculosis treatment.</p> <p>Addition of pyridoxine to protect against peripheral neuropathy.</p>
27/9/19	Stenotrophomonas is detected from cultures	Treatment modification to TMP-SMX
30/9/19	Continuous hemodialysis stopped	was placed on IV furosemide

3/10/19	Surgical cleaning of thighs.	
4/10/19	Mobilization out of bed and on automatic ventilation model - preparation for T-pieces tests	
9/10/19	Resubmission of tissue cultures from thighs for classic culture (CLEAN WOUND)	



**Figure 1:** Right inner thigh - left inner thigh.



**Figure 2:** Right inner thigh - left inner thigh.



**Figure 3:** Right inner thigh - left inner thigh.



**Figure 4:** Right inner thigh - left inner thigh.



**Figure 5:** Right inner thigh - left inner thigh.

Tuberculosis abscesses are sometimes confused with tumors [11]. Tuberculosis should be considered in the differential diagnosis of cold abscesses, especially in immunocompromised patients [5]. Diagnostic methods for tuberculosis cold abscesses include:

1. Laboratory methods: Smear, culture and PCR of drained material [12].
2. Imaging methods: Ultrasound, computed tomography (CT) and magnetic resonance

imaging (method of choice) [2,4,5,8].

Aspiration of the abscess and laboratory examination is usually sufficient to confirm the diagnosis [9]. These abscesses are indistinguishable from pyogenic abscesses on imaging methods [1]. On MRI, the abscess is hypo-signal on T1 and hyper-signal on T2 and is non-enhancing with gadolinium while the abscess wall is enhanced. Most tuberculous abscesses in the literature were treated with medical and surgical procedures [8]. Currently, the preferred treatment for these abscesses is CT-guided drainage [6]. Indications for surgery in these patients include:

1. Failure to treat with drainage.
2. Conditions suggestive of drainage are contraindicated depending on the case.
3. Surgery is required for other reasons [4,5].

Response to treatment is based on improvement in clinical manifestations, resolution of the abscess on imaging studies, and reduction in ESR [2]. Treatment regimens for pulmonary and extrapulmonary TB do not differ [4]. This report presented a patient with rheumatoid? arthritis with cold tuberculous abscess in the soft tissues (left and right thigh). Immunosuppression in the setting of corticosteroid use was a significant risk factor for this patient.

## Conclusions

In conclusion, surgical debridement was applied to this particular patient on a systematic basis and together with the standard anti tuberculosis regimen she was receiving was of decisive importance for the patient herself. The patient was discharged from the Intensive Care Unit of the Nicosia General Hospital and went for further treatment in another ward of the hospital. After some time she was discharged from the ward, where

she is now at home.

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