INTERNAL MEDICINE

□ CASE REPORT □

Tuberculous Fasciitis in Polymyositis: A Rare Case of Extrapulmonary Tuberculosis

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Abstract

A 71-year-old woman with polymyositis presenting with left thigh pain and an intermittent fever was admitted to Osaka Rosai Hospital. We initially diagnosed that her pain and fever were caused by a soft tissue infection because her polymyositis was controlled. She did not respond to various antibiotic therapies. Chest computed tomography demonstrated miliary tuberculosis (TB). Ziehl-Neelsen staining of liver biopsy specimens revealed epithelioid cell granuloma and acid-fast bacilli. Therefore, we finally diagnosed the lesion as TB fasciitis that improved with anti-TB drug therapy. The atypical presentation of TB fasciitis demonstrates the clinical importance of eliminating TB infections in immunocompromised hosts.

Key words: tuberculous fasciitis, polymyositis

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Introduction

Tuberculosis (TB) is a major cause of morbidity and mortality worldwide (1). Although the number of TB cases in Japan has gradually decreased, more than 20,000 cases are still diagnosed annually. Of these newly recognized TB cases, pulmonary TB is the most frequently diagnosed form, whereas extraspinal musculoskeletal TB comprises <1% (2). Approximately 20% of all TB patients are immunocompromised hosts, and >50% of them suffer from extrapulmonary TB (3).

Tuberculous fasciitis is a type of mycobacterial soft tissue infection secondary to hematogenous spread to the fascia. Although its occurrence is quite rare, a delay in appropriate anti-TB treatment can be fatal. In this study, we report a case of tuberculous fasciitis in a patient with underlying polymyositis who was undergoing immunosuppressive therapy.

Case Report

A 71-year-old woman with polymyositis presenting with left thigh pain and an intermittent fever came to Osaka Rosai Hospital for treatment. She had been diagnosed with polymyositis by a muscle biopsy 17 years previously and placed on prednisolone therapy at that time. Initially, the dose of prednisolone was 30 mg/day, which was gradually tapered; however, her polymyositis relapsed many times with a dose of 15 mg/day. One month before admission, her creatine kinase, myoglobin, and aldolase levels became elevated when taking a dose of 12.5 mg/day. Considered a recurrence of polymyositis, she began taking 25 mg/day. After that, she lost 3 kg of body weight during a 2-week period and had concurrent diarrhea, vomiting, and loss of appetite. She experienced pain in her left thigh and a fever that were not present 1 month prior to admission, but no night chills. The patient was then admitted to our ward for examination and treatment. Her past medical history indicated that she underwent right hemicolectomy for colon cancer at 61 years of age and suffered cellulitis in her leg at 69 years of age. The patient had no history of TB.

On admission, the patient's body weight was 35.8 kg, blood pressure was 116/76 mmHg, heart rate was 88 bpm, and body temperature was 37.0°C. From dawn to noon, the patient had an intermittent fever of 39.5°C, but from noon to

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Table 1. Laboratory Data on Admission.

Blood cell count			Biochemistry		
White blood cells	7,400	/μL	Sodium	140	mEq/L
Neutrophils	96.2	%	Potassium	3.5	mEq/L
Lymphocytes	2.0	%	Chloride	105	mEq/L
Monocytes	1.7	%	Total protein	5.8	g/dL
Eosinophils	0.1	%	Albumin	3.4	g/dL
Basophils	0.0	%	AST	28	U/L
Red blood cells	472	$\times 10^4$/μL	ALT	37	U/L
Hemoglobin	11.5	g/dL	LDH	354	U/L
Platelets	25.1	$\times 10^4$/μL	Creatine kinase	53	U/L
			Myoglobin	94	ng/mL
Coagulation			Aldolase	9.8	U/L
PT-INR	1.05		Creatine	0.59	mg/dL
APTT	27.8	sec	Urea nitrogen	23	mg/dL
			Creatinine	0.76	mg/dL
Urinalysis					
Proteinuria	(-)		Serology		
Hematuria	(-)		C-reactive protein	6.61	mg/dL
Creatinine	57.34	mg/dL	Procalcitonin	0.37	ng/mL
Creatine	<0.50	mg/dL	anti Jo-1 antibody	(-)	
			QFT-3G	(+)	

PT-INR: prothrombin time-international normalized ratio, APTT: activated partial thromboplastin time, AST: aspartate aminotransferase, ALT: alanine aminotransferase, LDH: lactate dehydrogenase, QFT-3G: QuantiFERON®-TB Gold In-Tube

midnight, her body temperature decreased to 36°C. The pattern of her body temperature was unrelated to the medications she was taking, such as prednisolone; moreover, she had never taken nonsteroidal anti-inflammatory drugs throughout her admission period. The patient showed no symptoms of a cough or sputum. On physical examination, the patient's left posterior thigh showed swelling and tenderness in the absence of any redness or rash. The anterior side of the thigh was free of symptoms, which led us to conclude that the cause of pain was not polymyositis but a soft tissue infection. Her chest and abdomen were quite normal. Laboratory data from the patient's blood tests are shown in Table 1. Briefly, the white blood cell (WBC) count was within the normal range [7,400/μL (normal range: 3,000-8,000/μL)] and C-reactive protein (CRP) levels were elevated [6.61 mg/dL (normal range: <0.30 mg/dL)]. The creatine kinase levels were found to be within normal limits [53 U/L (normal range: 45-163 U/L)]; although high, her myoglobin [94 ng/mL (normal range: <60 ng/mL)] and aldolase levels [9.3 U/L (normal range: 2.1-6.1 U/L)] were not considered to be elevated when compared with ambulatory practice data. Therefore, it was concluded that the patient's polymyositis was under control.

The procalcitonin levels were slightly high [0.37 ng/mL (normal range: <0.05 ng/mL)] and an interferon gamma release assay (QuantiFERON®) was positive. Because she had been taking prednisolone for 17 years, we considered her to be an immunocompromised host and repeatedly examined her blood and urine specimens for bacterial cultures and blood, urine, sputum, and gastric fluid specimens for mycobacterial cultures. All of the results were negative. Her chest X-ray appeared normal. No malignancy was found using gastrointestinal endoscopy nor was vegetation found using transthoracic echocardiography. Thus, a diagnosis of left thigh cellulitis was made.

Cefazolin treatment was initiated on the day of admission. Fifteen minutes later, the patient's face turned red and her blood pressure decreased to 80/48 mmHg. Because the patient was already undergoing corticosteroid therapy, we considered this allergic reaction to be anaphylactic shock. We then changed the patient's treatment from cefazolin to clindamycin, however, the same phenomenon occurred. On our third attempt, we placed the patient on teicoplanin treatment, but this also failed. Although we were able to safely administer meropenem and vancomycin for one week, her febrile state and left thigh pain did not improve.

Because the antibiotic treatments were ineffective, we conducted further tests to determine the cause. Enhanced computed tomography (CT) of the chest and abdomen, which were examined on day 5, did not show any significant signs of inflammation or malignancy (Fig. 1a and b). There was no sign of vegetation using transesophageal echocardiography. Lower limb CT and magnetic resonance imaging (MRI) on day 7 showed inflammation that was limited to the left fascia and was not intramuscular (Fig. 2a and b). Thus, cellulitis or fasciitis was suspected. Positron emission CT using fluorodeoxyglucose revealed marker accumulation in the liver, spleen, ileocecum, and left inguinal lymph node, which suggested the presence of malignant lymphoma. We planned muscle and lymph node biopsies to confirm these diagnoses, however, before we could perform them, the patient suddenly complained of swelling in her left lower limb. The edema worsened over three days, and venous ultrasonography revealed deep vein thrombosis. Urgent enhanced chest CT on day 22 revealed no pulmonary thromboembolism but indicated small-diffused nodules, which were not apparent in previous enhanced CT (Fig. 1c and d). A liver biopsy was performed, and the pathological study of the specimen showed epithelioid cell granuloma. Acid-fast bacilli were detected by Ziehl-Neelsen staining. Thus, the patient was diagnosed with miliary TB. *Mycobacterium tuberculosis* detected on culture showed susceptibility to all tested anti-TB drugs. The patient received anti-TB drug therapy, including 200 mg/day of isoniazid, 300 mg/day of rifampicin, 500 mg/day of ethambutol, and 875 mg/day of pyrazinamide; the doses were based on her body weight (35.8 kg). Her intermittent fever resolved the following day and her left thigh pain and swelling vanished after five days. CT and MRI on day 33 showed that the patient's lower limb inflammation had improved (Fig. 2c and d), and her thigh pain was diagnosed as tuberculous fasciitis. She was moved to a TB hospital 12 days after commencing anti-TB drug therapy to receive advanced treatment.

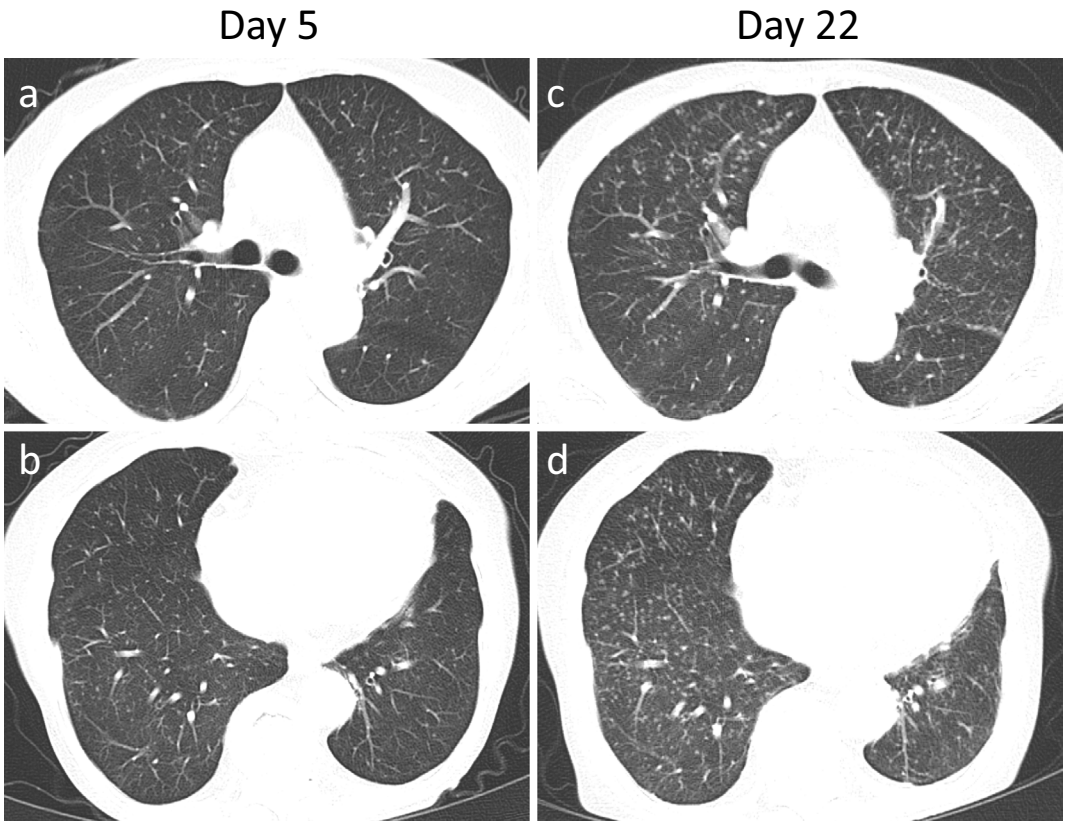

Figure 1. **Chest computed tomography on days 5 and 22. Minute nodules that were undistinguished on day 5 (a, b) were observed on day 22 (c, d).**

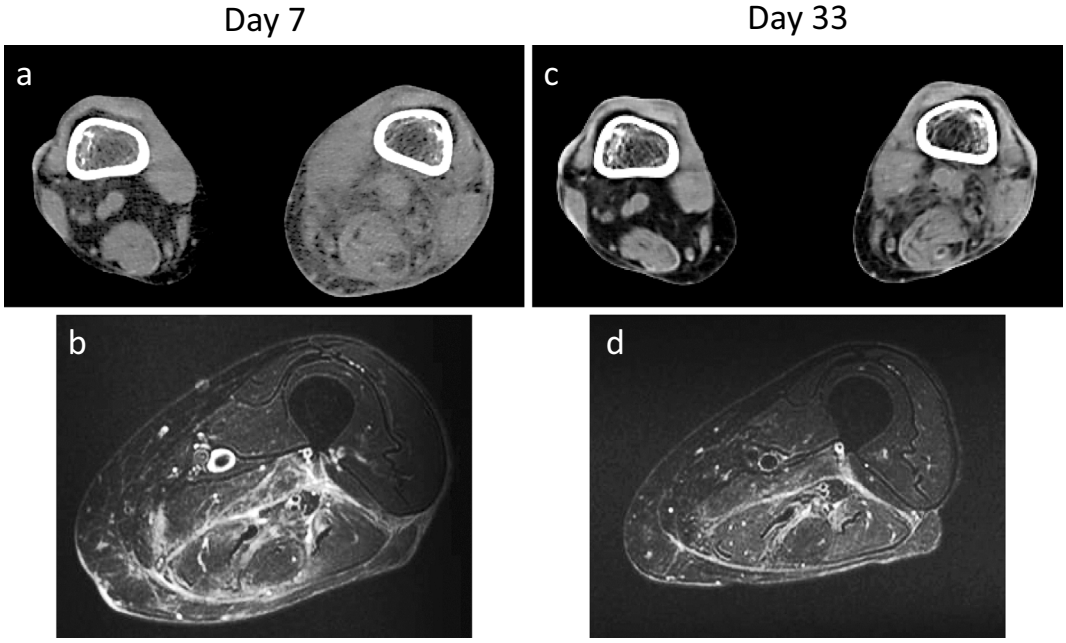

Figure 2. **Computed tomography (CT) (a, c) and fat-suppressed T2-weighted magnetic resonance imaging (MRI) (b, d) of the legs. The CT scan revealed soft tissue inflammation in the left leg with no aerogenic findings (a). Left femoral myofascial inflammation was observed on the MRI scan (b).**

Discussion

TB in soft tissue is quite a rare occurrence and it mostly observed in immunocompromised patients (4). In particular, only seven associated cases of tuberculous fasciitis have been reported since 1987 (Table 2) (5-11). In all of the cases, the patients were immunocompromised, and two out

Table 2. Case Series of Tuberculous Fasciitis in Immunocompromised Hosts.

Reference	Age (yr)/Sex	Underlying disease	Immuno-suppressive therapy	Past history of tuberculosis	Time from appearance to diagnosis	Outcome
5	46 male	IPF	PSL	Unknown	Over 12 weeks	Improve
6	60 female	Unknown	PSL	Exposed tuberculosis	Over 8 weeks	Improve
7	60 male	CSS	PSL	Unknown	5 weeks	Improve
8	69 male	DM	PSL	Tuberculous spondylitis	7 weeks	Death
9	24 female	SSc	D-penicillamine	(-)	20 days	Improve
10	46 female	DM	PSL, MTX	(-)	Over 2 weeks	Death
11	65 female	RA	PSL, MTX	Unknown	Unknown	Improve
Our case	71 female	PM	PSL	(-)	4 weeks	Improve

IPF: idiopathic pulmonary fibrosis, CSS: Churg-Strauss syndrome, DM: dermatomyositis, SSc: systemic sclerosis, RA: rheumatoid arthritis, PM: polymyositis, PSL: prednisolone, MTX: methotrexate

of seven cases resulted in death. Appropriate diagnoses of these cases were delayed because of the unusual presentation of tuberculous fasciitis. Thus, for an early diagnosis, it is highly important that cytology, biopsies, and imaging modalities such as ultrasound, CT, and MRI be performed. A biopsy would directly confirm the diagnosis of TB, but a muscle biopsy is quite invasive. Only one case was confirmed by a muscle biopsy (9), and the other six cases were confirmed by other surgical interventions (5-8, 10, 11). A muscle biopsy was planned for our case, however, miliary TB was diagnosed before a pre-surgical invasive work-up was done, and the patient was given anti-TB drug therapy. Anti-TB drugs were quite effective in treating the left femoral lesion. According to these results, the present case was diagnosed as tuberculous fasciitis. CT is useful for detecting deep-seated soft tissue infections as well as associated bone and joint disease (4). CT can also confirm rice grain calcification and abscesses in soft tissue (10). In MRI, affected lesions show a high signal intensity on T2-weighted images, and fat-suppression techniques are a helpful adjunct (4). Despite the availability of the above imaging methods, the diagnosis of tuberculous fasciitis is often delayed; according to Yoshida et al., it has historically taken an average of 11 weeks to reach the correct diagnosis (8). The early administration of anti-TB therapy can minimize the morbidity and mortality. In the present case, the patient had no history of TB, had a negative smear for acid-fast bacilli, and failed to produce a positive culture of *M. tuberculosis* from the sputum, urine, and gastric fluid specimens. These negative findings did not necessarily exclude TB. Imaging methods for a TB infection only revealed the presence of TB 4 weeks after the appearance of symptoms. As seen in previous cases, tuberculous fasciitis initially proved to be vague and difficult for us to be directly diagnose in our patient during the early stages (5-11). Three out of the seven previously described cases were comorbid miliary TB, and all three cases were diagnosed as miliary TB after surgical intervention (6, 7, 11). In our case, miliary TB was diagnosed before the muscle biopsy was required. We also were able to diagnose tuberculous fasciitis as a result of the response to miliary TB treatment. It is particularly worth noting that our polymyositis patient is the first case in Japan to present with tuberculous fasciitis and miliary TB.

In conclusion, we herein reported an atypical case of tuberculous fasciitis in a patient with polymyositis. Because soft tissue lesions appear in both tubercular fasciitis and polymyositis, it becomes difficult to distinguish between these conditions when no other lesions suggestive of TB are detected. In cases of refractory fasciitis resistant to antibiotics, diagnoses of TB infections should be ruled out carefully and promptly, particularly in patients receiving immunosuppressive therapy.

The authors state that they have no Conflict of Interest (COI).

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