Case Report

**Stenotrophomonas maltophilia** with histopathological features mimicking cutaneous gamma/delta T-cell lymphoma

Natalie Kash a,*, Harina Vin b, Richard Danialan c, Victor G. Prieto a,c, Madeleine Duvic a

a Department of Dermatology, The University of Texas Medical School at Houston and MD Anderson Cancer Center, 1400 Pressler Street Unit 1452, Houston, TX 77030, USA
b Baylor College of Medicine, Houston, Texas, USA
c Department of Pathology, The University of Texas MD Anderson Cancer Center, Houston, Texas, USA

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**S U M M A R Y**

We report a case of cutaneous *Stenotrophomonas maltophilia* infection which presented with clinical and histopathological findings that mimicked a gamma/delta (γδ) T-cell lymphoma. In this case, tissue culture of the biopsy specimen was key to determining the diagnosis and allowing appropriate treatment with oral trimethoprim–sulfamethoxazole and topical silvadene. A prompt complete resolution of lesions was observed following antibiotic treatment, with no recurrence of disease over the last 5 years, supporting an infectious rather than malignant etiology. In our patient, radiation therapy was indicated based on the misdiagnosis of γδ T-cell lymphoma, which was supported both clinically and histopathologically. However, tissue culture in this case avoided unnecessary radiation exposure and highlights the role of tissue culture in the evaluation of the biopsy of an undiagnosed cutaneous lesion.

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1. Introduction

*Stenotrophomonas maltophilia* is a ubiquitous Gram-negative bacillus. The organism primarily causes pneumonia and blood stream infections in clinical settings, but may also present in the skin. Cutaneous manifestations most often reported include metastatic nodules similar in appearance to disseminated fungal infections, cellulitis, ecthyma gangrenosum, and soft tissue necrosis. We present the case of an 80-year-old man who presented with ulcerated, scaling, violaceous papules, plaques, and nodules on the left lower extremity that were biopsied and interpreted by the dermatopathologist as cutaneous gamma/delta (γδ) T-cell lymphoma, but grew *S. maltophilia* on tissue culture. Resolution of the cutaneous lesions within 2 weeks of trimethoprim–sulfamethoxazole treatment supports the diagnosis of cutaneous *S. maltophilia* infection rather than a true γδ T-cell lymphoma.

2. Case report

An 80-year-old Caucasian male with a past medical history of coronary artery disease, hypertension, hyperlipidemia, and benign prostatic hypertrophy presented to an outside clinic after developing violaceous, pruritic papules on his left ankle and dorsal foot. The lesions were initially thought to be insect bites, but did not respond to topical halobetasol. His left calf and ankle became edematous, and the lesions increased in number, became tender, and continued to be pruritic. Oral prednisone was prescribed without improvement.

Two months later, he presented to our institution with approximately 40, 1-cm in size indurated, red–purple papules, plaques, and nodules on the left lower extremity (Figure 1A). Some lesions were noted to have overlying scale, while others showed no epidermal change. On physical examination there was 2+ pitting edema to the knee and no lymphadenopathy. The patient denied any systemic symptoms and was afebrile.

A punch biopsy from the left calf was performed and showed a dense, atypical T-cell infiltrate with epidermotropism and hyperchromatic lymphocytes in the epidermis concerning for cutaneous T-cell lymphoma (CTCL) (Figure 1B, C). Immunohistochemistry showed CD3 predominance, with scattered expression of CD30 on the lymphocytes (Figure 1D). In situ hybridization
Figure 1. (A) Violaceous papules and nodules on the anterior left lower leg. (B) Superficial and deep perivascular and periadnexal lymphoid infiltrate with focal involvement of the epidermis (400×, hematoxylin and eosin). (C) The lymphoid infiltrate was comprised of larger cells with hyperchromatic, irregular nuclear membranes (400×, hematoxylin and eosin). (D) The lymphoid infiltrate consisted of mostly CD3-positive T-cells, which focally infiltrated the epidermis (100×). (E) The lymphoid infiltrate showed granular staining with granzyme B (400×). (F) The atypical T-lymphocytes showed loss of staining for CD5 (200×). (G) The lymphoid infiltrate was negative for TCRβF1 (200×).
for Epstein–Barr virus (EBV) failed to reveal evidence of infection. PCR gene rearrangements for T-cell receptor beta (TCRβ) and gamma (TCRγ) were negative. Of note, the large, atypical, intraepidermal lymphocytes expressed CD3, T-cell intracytoplasmic antigen 1 (TIA-1), and granzyme B and were negative for CD4, CD5, CD7, CD8, and TCRβF1, thus consistent with the diagnosis of γδ T-cell lymphoma (Figure 1E–G).

Based on the clinical appearance, the dense and atypical lymphoid infiltrate on histopathology, and the immunophenotype supporting the diagnosis of γδ T-cell lymphoma, the patient was scheduled for radiation therapy. However, because a culture of the biopsy lesion grew S. maltophilia susceptible to trimethoprimsulfamethoxazole, he was treated for the infection first with a 14-day course of oral 800 mg sulfamethoxazole and 160 mg trimethoprim twice daily and topical silvadene applied twice daily. The lesions and edema of the left lower extremity improved rapidly after 1 week of therapy and continued to improve on antibiotic therapy alone. Radiation was never initiated, and the patient continues to be free of disease 5 years later.

3. Discussion

Cutaneous S. maltophilia infections, including cellulitis, erythema gangrenosum, and metastatic nodular lesions, predominantly involve immunocompromised hosts. Risk factors for S. maltophilia infection include underlying solid organ or hematological malignancy, neutropenia, intravenous catheter use, and immunocompromise. The immune response to S. maltophilia has been reported to be neutrophil-dominated and to involve the production of tumor necrosis factor alpha (TNFα) and interleukin (IL)-1β, and a mixed inflammatory infiltrate of lymphocytes and neutrophils accompanied by epidermal necrosis characterizes the histological appearance of S. maltophilia infection.

To our knowledge, S. maltophilia infection mimicking cutaneous lymphomas of any kind has not been reported previously. This immunocompetent patient had no risk factors for S. maltophilia infection, which may explain the robust inflammatory infiltrate mimicking lymphoma in this case. γδ T-cells are members of the innate immune system that localize to mucocutaneous surfaces and are known to regulate inflammation and epidermal homeostasis. The dense γδ T-cell infiltrate associated with S. maltophilia infection in this case suggests the role of innate immunity and γδ T-cells in the immune response of immunocompetent patients to S. maltophilia infection.

The γδ T-cell lymphoid infiltrate in our case mimicked the histopathological findings of cutaneous γδ T-cell lymphoma (CGDTCL). CGDTCL are lymphomas that express γδ TCRs and are rare, aggressive cancers that account for less than 1% of all CTCLs. Clinically, CGDTCL is characterized by plaques and tumors favoring the extremities. CGDTCL is characterized by the expression of CD3 and CD2 with variable CD7 expression, the expression of cytotoxic markers produced by γδ T-cells such as TIA-1 and granzyme B, and negative staining for TCRβF1 due to lack of expression of αβ T-cell chains by γδ T-cells. The patient’s clinical presentation, histopathological finding of a dense and atypical lymphoid infiltrate, and immunophenotype of CD3 positivity, positive cytotoxic profile, and negative TCRβF1 supported the diagnosis of CGDTCL.

However, the timely resolution of the lesions and 5-year disease-free period following treatment with oral trimethoprim-sulfamethoxazole strongly supports the diagnosis of cutaneous S. maltophilia infection rather than CGDTCL. S. maltophilia is a multidrug-resistant organism with resistance reported to antibiotics including carbapenems, β-lactams, macrolides, cephalosporins, fluoroquinolones, aminoglycosides, chloramphenicol, tetracyclines, polymyxins, and more recently to trimethoprim-sulfamethoxazole and ticarcillin–clavulanic acid, which had been the mainstays of therapy. The S. maltophilia cultured from our patient’s cutaneous lesion displayed resistance only to cefazidime and showed sensitivity to levofloxacin, moxifloxacin, chloramphenicol, minocycline, tigecycline, trimethoprim–sulfamethoxazole, and ticarcillin–clavulanic acid based on susceptibility testing. Clinically, complete resolution of symptoms was noted following treatment with trimethoprim–sulfamethoxazole, and new treatment strategies such as combination antibiotic therapy were not required in this case.

In the case presented, cutaneous S. maltophilia infection of an immunocompetent host demonstrated histopathological and clinical features that mimicked a CGDTCL. CGDTCL is relatively resistant to treatment, but chemotherapy and targeted radiation may palliate lesions. Based on the findings suggestive of CGDTCL, our patient was scheduled for radiation therapy. However, the growth of S. maltophilia from the culture of the biopsy specimen and the resolution of symptoms and 5-year disease-free period following trimethoprim–sulfamethoxazole therapy strongly supported the diagnosis of cutaneous S. maltophilia infection. Culture of the tissue in this case not only allowed prompt diagnosis and appropriate treatment, but also avoided the unnecessary radiation exposure that was indicated and was nearly performed following the misdiagnosis of CGDTCL in our patient.

In conclusion, this case demonstrates the importance of the consideration of tissue culture of biopsy specimens in addition to histopathological characterization in the diagnosis of unknown cutaneous lesions and suggests that an innate immune response with γδ T-cells may imitate CGDTCL in immunocompetent patients.

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References