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# Eosinophilic infiltrate resembling eosinophilic cellulitis (Wells syndrome) in a patient with mycosis fungoides

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## Abstract

Mycosis fungoides (MF) is a T-cell, non-Hodgkin lymphoma that primarily involves the skin. Extracutaneous involvement, such as in the parotid gland, is characteristic of end-stage disease. Eosinophilic cellulitis, or Wells syndrome, is a rare inflammatory dermatitis that involves a dermal infiltrate of eosinophils. We report a case of an 80-year-old man with a long-standing diagnosis of stage IIB MF who acutely developed parotid gland involvement and marked hypereosinophilia that most likely represented eosinophilic cellulitis. Activated T cells from his MF were likely a trigger factor for the development of his eosinophilic cellulitis. To our knowledge, this is the first reported case of an MF patient with atypical parotid gland involvement and eosinophilic cellulitis.

*Keywords: cutaneous T cell lymphoma, mycosis fungoides, parotid gland, eosinophilic cellulitis, Wells syndrome*

## Introduction

Mycosis fungoides is a cutaneous T cell lymphoma (CTCL). Extracutaneous involvement of malignant T cells is seen in end stage disease [1]. Atypical, epidermotropic CD4+ T lymphocytes are a hallmark of MF, but a considerable number of eosinophils and plasma cells may be present in the histology of the folliculotropic MF variant [2]. Eosinophilic cellulitis, or Wells syndrome, is a recurrent dermatitis of unknown etiology. It is possibly associated with malignancy [3]. Histiocytes, eosinophils, and eosinophilic granules

infiltrate the dermis in eosinophilic cellulitis [4].

We report a case of an 80-year-old man with a long-standing diagnosis of stage IIB MF who acutely developed parotid gland involvement and marked hypereosinophilia that most likely represented MF with associated eosinophilic cellulitis. To our knowledge, this is the first reported case of patient with atypical parotid gland involvement of both MF and eosinophilic cellulitis.

## Case Synopsis

An 80-year-old man with a longstanding history of stage IIB folliculotropic MF presented with recurrent, progressive, painful swelling in his bilateral face overlying the parotid glands. The patient was already on low-dose, systemic dexamethasone therapy for parotid swelling of unknown etiology seen at two previous hospitalizations over the three months prior to current presentation.

On physical examination, the patient's vitals were unremarkable and he exhibited a poorly defined erythematous and indurated plaque overlying the parotid gland on his left face (**Figure 1**). His right posterior neck showed an ulcerative lesion that was previously interpreted as MF on histopathologic examination.

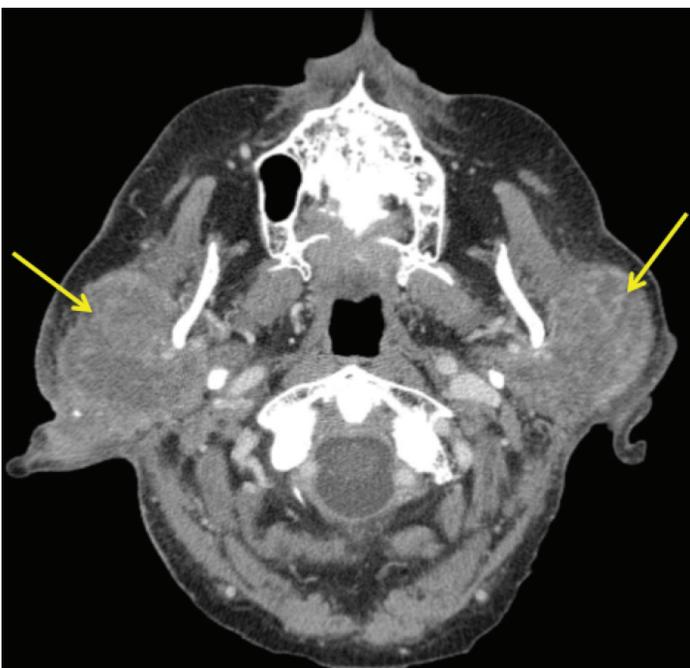
Laboratory findings were remarkable for hypereosinophilia at 44% of the differential count on hemogram. Routine blood, urine, sputum, and wound [of neck tumor] cultures, along with tests for Epstein-Barr virus, cytomegalovirus, herpes simplex virus, human immunodeficiency virus, *Strongyloides*,



**Figure 1.** Left: Erythematous plaque (arrow) with underlying induration and edema above the parotid glands, which is more prominent on the left side of the patient's face. Right: The patient's left side of the face also is more edematous as highlighted by the arrow.

and *Brucella* were negative. Anti-nuclear, anti-SSA, anti-SSB, and antineutrophil cytoplasmic antibodies were negative. The FIP1L1-PDGFR $\alpha$  rearrangement was not detected by polymerase chain reaction.

A CT scan showed progressive bilateral parotid swelling (**Figure 2**). Core biopsy of the left parotid revealed extensive necrosis, marked eosinophilic hyperplasia, and atypical T-cell lymphoproliferation in the fibroconnective tissue (**Figure 3**). Perivascular eosinophils (**Figure 4**) and flame figures (**Figure 5**)



**Figure 2.** Computerized tomography showing progressive, bilateral parotid swelling (indicated by yellow arrows).

were also noted on sections of the core biopsy. Immunohistochemical staining revealed that the atypical lymphocytes were uniformly positive for CD3, had an approximate CD4-to-CD8 ratio >6:1, and were negative for CD7.

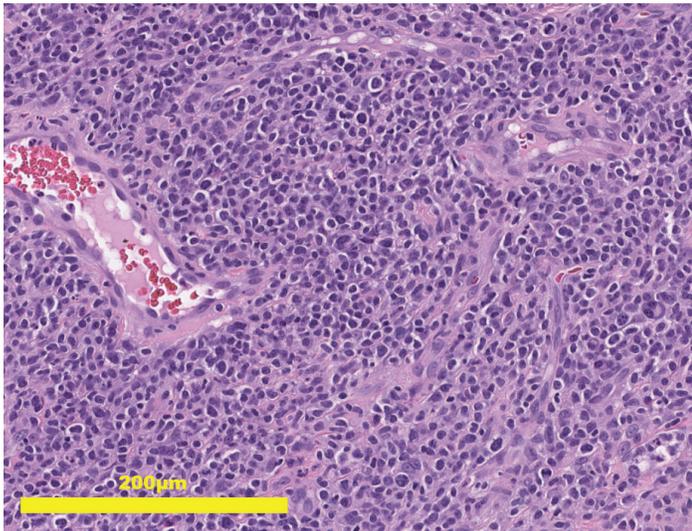
The patient's cellulitis was stable on systemic prednisone 40mg once daily by mouth and his hypereosinophilia resolved. Anti-infective therapies included vancomycin, piperacillin-tazobactam, tigecycline, sulfamethoxazole-trimethoprim, levofloxacin, acyclovir, and posaconazole. His parotid masses were stable despite his MF progressing on topical bexarotene, whirlpool therapy, mupirocin, and 540cGy of radiation. The patient passed away two weeks later after changing his goals of care to only comfort measures.

## Discussion

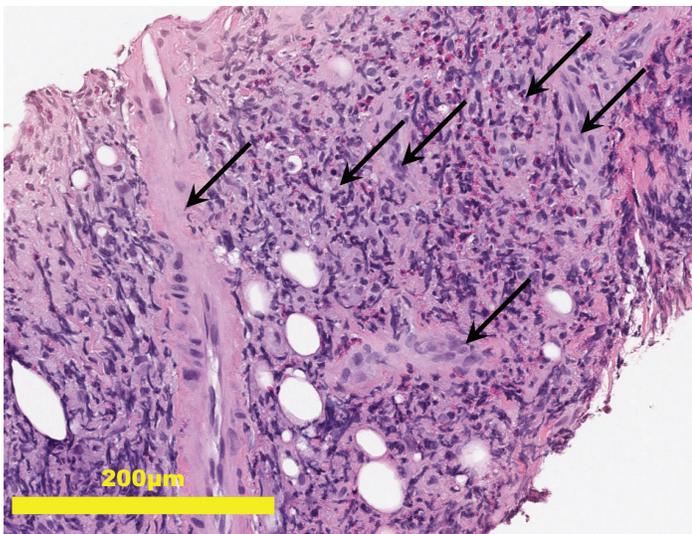
Eosinophilic cellulitis (Wells syndrome) is an uncommon dermatitis characterized mainly by eosinophils and eosinophilic granules infiltrating the dermis. Histopathology varies by phase of infiltration. Leukocytes and histiocytes with surrounding edema are seen in the acute phase, masses of eosinophils and their debris collect around collagen bundles producing "flame figures" in the sub-acute phase. Phagocytic histiocytes remain around the flame figures in the resolution phase once the eosinophils are gone [3]. The acute infiltration results in erythematous patches or plaques that are can be responsive to systemic corticosteroids or spontaneously resolve [4]. The disease process is commonly and most often associated with arthropod bites or drugs, but can also be associated with hematological malignancies as well [3].

Our patient is the first reported patient with MF involving the parotid glands who presented with marked hypereosinophilia. Our patient had multiple extensive evaluations for his parotid and superficial facial swelling. No other cause could be found other than MF infiltration of the parotid gland with likely overlying eosinophilic cellulitis.

There were several reasons why we believe eosinophilic cellulitis in association with MF was the most likely diagnosis. Our patient had a mild,

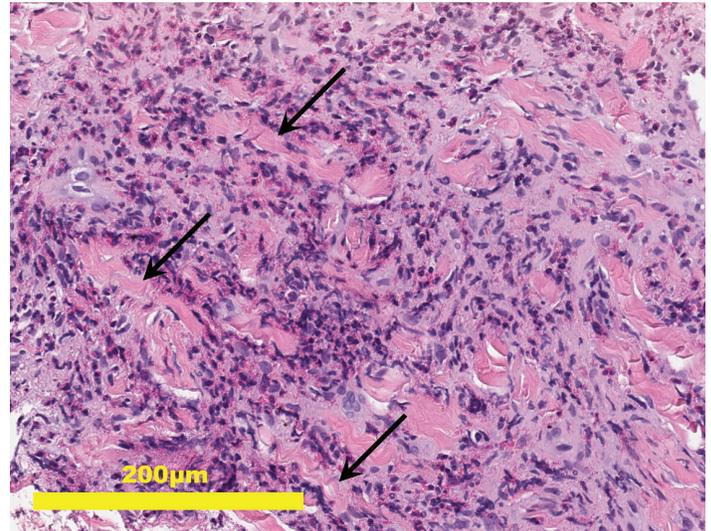


**Figure 3.** Core biopsy of the left parotid with extensive necrosis, marked eosinophilic hyperplasia, and focal, distorted lymphohistiocytic proliferation in the connective tissue. These findings are consistent with T cell lymphoma, specifically MF, involving left parotid tissue.



**Figure 4.** A 40x power of the left parotid gland and overlying cutaneous tissue with perivascular eosinophils, which are highlighted by black arrows.

persistent hyper eosinophilia for many months before presentation. The hyper eosinophilia could have related to his underlying folliculotropic MF. However, the patient had a previous neck tumor and concurrent lip biopsies consistent with folliculotropic MF. None of these biopsies showed an eosinophilic infiltrate that was consistent with eosinophilic cellulitis. A core biopsy of the site of recurrent cellulitis showed perivascular eosinophils and flame figures consistent with eosinophilic cellulitis and the parotid gland showed an atypical T lymphocytic infiltrate consistent with MF. The patient also had a recurrent



**Figure 5.** A 40x power of the left parotid gland and overlying cutaneous tissue with flame figures, or masses of histocytes, eosinophils and their degranulated debris, and leukocytes surrounding a core of collagen. Three examples are highlighted by black arrows.

cellulitis that was not improved with multiple broad-spectrum antibiotics or antineoplastic therapies. Lastly, the patient's facial swelling and blood eosinophilia improved rapidly after administration of systemic corticosteroids despite worsening of his underlying folliculotropic MF and persistent parotid swelling.

Immunophenotyping of peripheral T cells in eosinophilic cellulitis typically demonstrates an increased proportion of CD3+ and CD4+ T cells [5]. This finding suggests that activated T cells may be involved in the pathogenesis of blood and tissue eosinophilia. Eosinophils degranulate in the dermis, which causes edema, inflammation, and even necrosis [6]. Our patient experienced worsening of his MF and acute involvement of his parotid glands. The activated T cells likely triggered the development of eosinophilic cellulitis. Although he was initially treated and improved with systemic corticosteroids, his condition worsened over time owing to progression of his MF.

There have been no other confirmed cases of parotitis and associated eosinophilic cellulitis in the literature. To our knowledge, there has only been one reported case of suspected parotid swelling in the setting of eosinophilic cellulitis [7]. The patient presented with diffuse edema and erythema including the bilateral parotid glands. He also had hyper eosinophilia and had

a distant location (leg) skin biopsy with an infiltrate of eosinophils in the dermis and extension into the underlying subcutaneous tissue. The patient was not formally diagnosed with parotitis or eosinophilic cellulitis, but idiopathic hypereosinophilic syndrome was ruled out as in our case [7].

## Conclusion

To our knowledge, our report is the first description of two rare diseases with an atypical presentation: involvement of MF in the parotid glands and eosinophilic cellulitis. The workup for eosinophilic cellulitis is extensive and should exclude infectious, hypersensitivity, and vasculitic causes. Malignancy, such as MF in our patient, should also be thoroughly investigated. Malignancy should also be included in the differential diagnosis for both hypereosinophilia and parotid masses. However, hypereosinophilia in malignancies like folliculotropic MF are non-specific and are not included in diagnostic criteria for folliculotropic MF. More research is needed to substantiate the association of eosinophilic cellulitis and CTCL like MF.

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