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CUTANEOUS NOCARDIOSIS MANIFESTING AS A FRONTAL MASS IN A PATIENT WITH GIANT CELL ARTERITIS

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Abstract

We report the case of a subcutaneous abscess due to Nocardia spp. mimicking a spontaneous hematoma or an aneurysm of the temporal artery branch, in a giant cell arteritis patient treated with methylprednisolone and azathioprine. Ultrasonography, incision and drainage with cultures helped in the diagnosis.

This case highlights the importance of considering rare pathogens in immunosuppressed patients, besides the more frequent disease complications.

Keywords: nocardiosis, giant cell arteritis, subcutaneous abscess

Introduction

Nocardiosis is an infection due to *Nocardia* aerobic actinomycete responsible for localized or disseminated infections. *Nocardia* species are ubiquitous environmental saprophytes, occurring in soil, organic matter and water. Human infection usually arises by inhalation or from direct inoculation of the skin or soft tissues. Nocardiosis is not common in clinical practice and most cases occur as an opportunistic infection in immunocompromised patients.

Giant cell arteritis (GCA) is a systemic large-vessel vasculitis of the elderly that affects extracranial arteries, mainly temporal arteries, but also the aorta and peripheral arteries. Amongst the various serious systemic complications, the most dreaded is visual loss, due to ophthalmic artery involvement, and large dose corticosteroids are administered in the attempt to prevent it. GCA may co-exist with polymyalgia rheumatica, a more common inflammatory disease of the elderly that requires lower doses of prednisone [1].

Case report

A 74 years old patient, diagnosed one month prior with giant cells arteritis (GCA), treated with methylprednisolone and azathioprine, presented with a superficial, soft, painless mass on the right frontal scalp region, noticed by the patient to have grown slowly in the previous week. From the medical history we report pulmonary tuberculosis (treated in 1975), Lyme borreliosis treated with intravenous ceftriaxone in March 2013, followed by moderate *Clostridium difficile* infection. The laboratory tests revealed increased erythrocyte sedimentation rate (ESR=120 mm/hour) and C-reactive protein (CRP=2.05 mg/dl), hyper-potassemia (5.9 mEq/l) and hypo-sodemia (132 mEq/l).

One week before, physical examination had shown an enlarged painful left temporal artery and a previously absent right frontal scar, most probably a cutaneous superficial atrophy due to vasculitis (Figure 1a, b). Therefore, the new frontal mass suggested a hematoma from a vasculitis-injured vessel effraction, or a superficial arterial aneurysm. Ultrasonography, performed with an Esaote MyLab ™Five machine with a 10-13 MHz multifrequence linear transducer, showed an aspect compatible with an abscess (Figure 2). A puncture from the scalp collection reveled pus; a drainage tube was inserted for complete evacuation. The microscopic examination revealed Gram-positive long thin branching roads and culture on Colombia blood agar was indicative of *Nocardia* spp. with white chalky colonies after 3 days of incubation

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(Figure 3). Because direct inoculation of *Nocardia* was less probable (no skin lesion was visible and the patient did not recall any injury), disseminated infection was suspected. The cerebral MRI and abdominal CT did not find any abscesses. The pulmonary radiography detected left apical and subclavicular nodules recalling previous healed pulmonary tuberculosis, but also multiple bilateral subclavicular nodular opacities, the latter not present on the x-ray performed one month before, suggestive of possible tuberculosis reactivation or pulmonary nocardiosis. A bronchoscopy with bronchoalveolar aspiration showed the aspect of suppurative bronchitis; culture identified *Acinetobacter calcoaceticus*, interpreted as colonization and not as infection, as no pneumonia was detected on X-ray findings. Pulmonary CT scan showed the image of a subcarinal mediastinal mass with polycyclic shape, 6 cm in diameter, other mediastinal adenopathies and minimal bilateral pleural effusion. The transbronchial biopsy was not successful, while diagnostic thoracotomy could not be performed, due to the altered status of the patient.

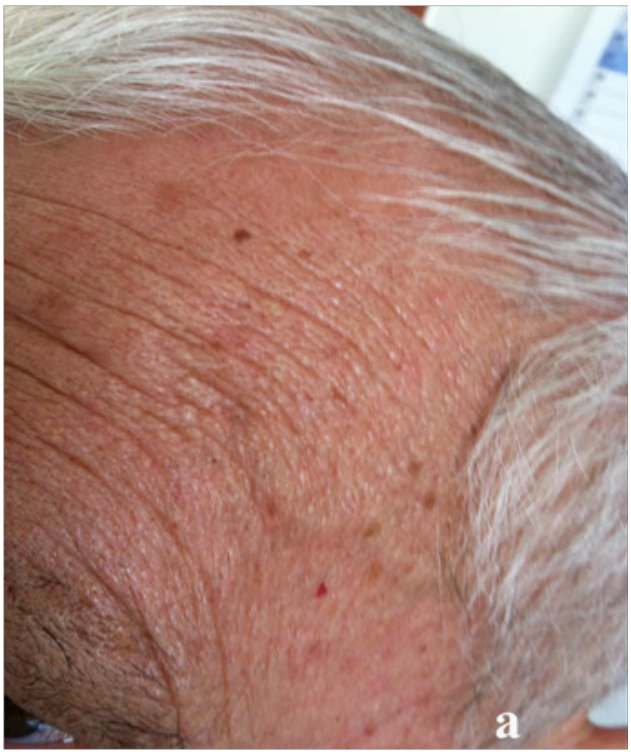

Figure 1a. Left temporal artery enlargement with local tenderness.

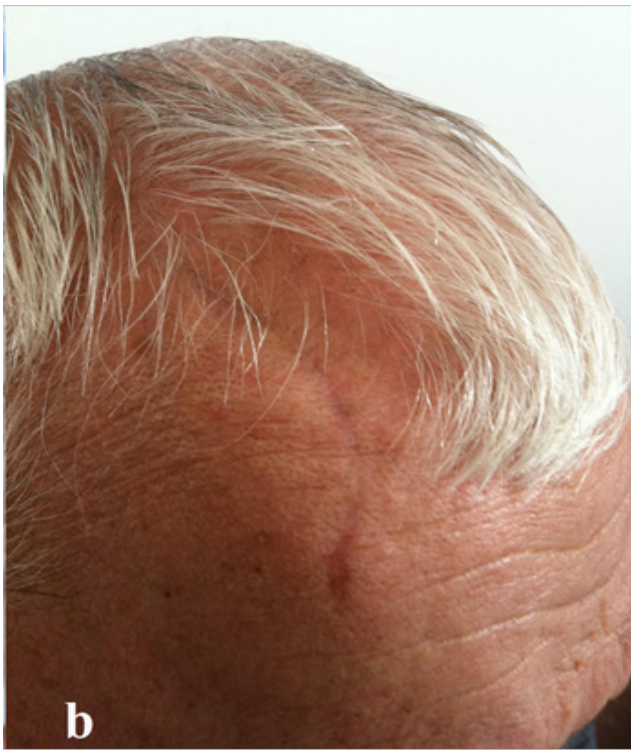

Figure 1b. Right frontal scar, occurred spontaneous, likely due to vasculitis-related skin atrophy. There are also small areas of cutaneous necrosis.

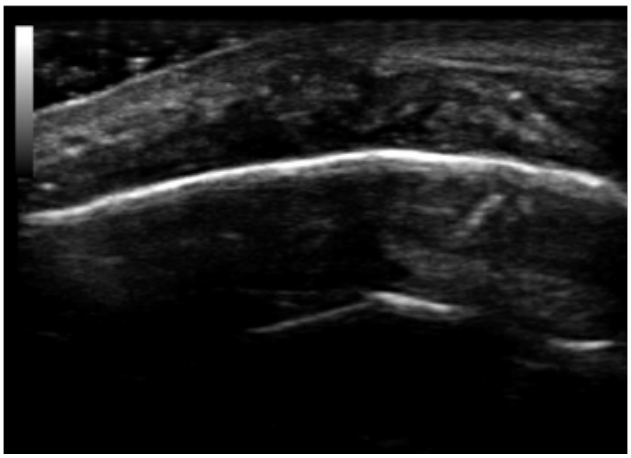

Figure 2. Hypoechogenyc heterogeneous lesion located in soft parts of the frontal region, extending dermo-epidermal and possible tendency to fistulization.

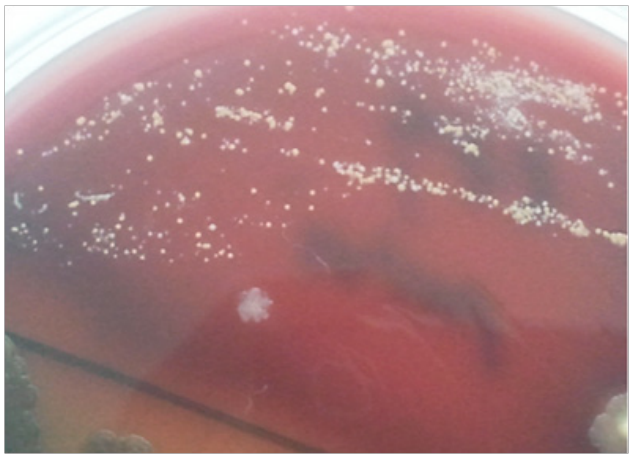

Figure 3. Colonies of Nocardia species after 72 hours of growth on Colombia blood agar.

The patient underwent therapy with intravenous imipenem-cilastatin 2g/day for 21 days and Amikacin 1g/day for 14 days for Nocardia infection, associated with tuberculostatic therapy (rifampicin, izoniazide, ethambutol and pyrazinamide). Tuberculostatic therapy was initiated due to the presence of radiologic subclavicular nodular opacities in a patient with immunosuppressive therapy and history of pulmonary tuberculosis and was stopped when cultures for *Mycobacterium tuberculosis* were reported as negative.

The scalp collection completely resolved after surgical drainage and antibiotic therapy. Therapy for nocardiosis was recommended after discharge with long term trimethoprim-sulfamethoxazole (TMP 10 mg/kg/day), justified by the immunocompromised status and immunosuppressive therapy. However, after 2 months the patient developed drug-induced myelosuppression and a severe and complicated recurrent *Clostridium difficile* infection that led to multiorgan dysfunction and exitus.

Discussion

Nocardia are ubiquitous, soil-borne organisms that are most commonly introduced into the body via inhalation or through a cut or abraded skin. In humans nocardiosis presents as pulmonary, systemic, cutaneous or central nervous system disease. It usually occurs in immunodepressed individuals suffering from diabetes, malignancies, HIV/AIDS, lung disorders, connective tissue disorders, chronic alcoholism, transplant patients, and patients on corticosteroid therapy [2].

Cutaneous nocardiosis is an uncommon infectious disease that presents as primary cutaneous infection or as a part of disseminated pulmonary nocardiosis.

Due to the frontal localization of the subcutaneous abscess in our patient and the signs of active vasculitis, an arterial aneurysm or a hematoma from a vasculitis-injured vessel effraction were first suspected. Aneurysms involving the aorta or other vessels are found in 18% of GCA cases, particularly of the thoracic aorta [3]. However, in peripheral arteries GCA evolves rather with occlusions due to smooth, long segments of wall thickening [4].

Ultrasonography was useful for the differential diagnosis (Figure 2). In GCA, the arteries involved have a hypoechoic wall thickening (the *hallo* sign) [5]. Blood pulsations are seen in an enlarging aneurysm, while in pseudoaneurysms resulting from a vessel wall rupture contained by the adventitia or surrounding tissue, the turbulent forward and backward flow realize the *yin-yang* sign [6]. No link with the vessel was found in our case.

In abscesses, ultrasonography identifies spherical complex fluid collections, with irregular borders, and content ranging from anechoic to hyperechoic, depending on its age, sometimes with mass effect. The pus may be compressed with the transducer. Wall hyperemia and gas as acoustic shadowing or reverberation artifacts may be seen [7].

Successful treatment of the subcutaneous abscess included surgical drainage and antibiotic treatment.

Imaging manifestations of pulmonary nocardiosis include irregular nodules (usually cavitating when large) and pleural effusions [8]. The X-ray findings are nonspecific and differential diagnosis with *Mycobacterium tuberculosis* infection was difficult in a patient with history of pulmonary tuberculosis, as culture time for *Mycobacterium* species is long. Regarding the *Nocardia* culture from bronchoalveolar aspiration, Nocardial colonies are easily obscured by more rapidly growing bacteria in specimens containing mixed flora (e.g., respiratory secretions) [9]. Though *Acinetobacter calcoaceticus* pneumonia is increasingly described in critically ill patients, the CT scan did not support the diagnosis of pneumonia and Acinetobacter calcoaceticus was interpreted as a colonizing bacteria. Nocardiosis may manifest on pulmonary CT as a solitary or multiple lung nodules of various sizes [10], not found on the pulmonary CT. The subcarinal mediastinal mass with polycyclic shape, absent two months earlier, was interpreted as a lymph node mass, although a tumour or ganglionary tuberculosis could not be completely ruled out, as the family did not approve the biopsy or post-mortem autopsy.

Nocardiosis occurs in immunocompromized hosts, but it was reported in only few GCA patients (Table I). Héron et al. (2006) reported a choroidal abscess due to Nocardia infection mimicking GCA disease-related ophthalmic manifestations [11]. Borget et al. (1992) reported a *Nocardia* deltoid abscess in a patient with GCA [12] and Sherber et al. (2006) reported an ulcerated skin lesion due to *Nocardia* infection in a patient with GCA, also on less than a month of immunosuppressive therapy [13]. To our knowledge, primary Nocardia subcutaneous abscess has not been previously reported associated to GCA, and its frontal localization was initially deceiving. It may be speculated that the abscess site could have been related to our patient's local cutaneous ischemia, a recognized GCA complication associated with an increased mortality [14]. Interestingly, in a previous report, the temporal artery biopsy revealed an infectious Nocardial arteritis [11]. In our patient a further biopsy was not performed after the abscess finding and drainage.

Steroid use is an independent risk factor for Nocardia infection, the risk being lowered by steroid-sparing therapy [15]. Moreover, Nocardia infections have been reported also in polymyalgia rheumatica, where lower corticosteroid doses are required [16]. The symptoms and laboratory may mimic a disease relapse or complication, leading to intensification of therapy.

This case emphasizes that in patients with giant cell arteritis rare immunosuppression-related infections have to be taken in account, besides the more frequent disease complications. The symptoms and laboratory analyses may suggest a disease relapse, leading to

unnecessary intensification of immunosuppressive therapy. Ultrasonography may be helpful in these instances, differentiating an active giant cell arteritis disease from other associated complications.

Table I. Nocardiosis in giant cell arteritis.

Report	Observations	References
Primary deltoid abscess	*Nocardia asteroides*	[12]
Lung abscess	*Nocardia asteroides (*coexisting with *Cryptococcus neoformans)*	[17]
Glabellar non-healing ulcer after inoculation	*Nocardia spp.*	[13]
Ocular and systemic nocardiosis	*Nocardia asteroides*	[11]
Endogenous endophtalmitis	*Nocardia farcinica*	[18]

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