Demodicosis revealing an HIV infection

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Abstract

We report an observation of facial and upper limb demodicosis, revealing a human immunodeficiency virus infection. After an initial improvement with metronidazole, worsening of skin lesions related to immune reconstitution inflammatory syndrome was observed, requiring the use of steroids.

Keywords: *Demodex*, demodicosis, human immunodeficiency virus, immune reconstitution inflammatory syndrome, metronidazole
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Case report

We report on a 34-year-old Tunisian man with no notable pathological history. He presented with a maculopapular, pustular and squamous erythematous rash on the face and upper limbs that had been evolving for 2 months, not improved by taking fusidic acid and doxycycline and exacerbated by the application of dermocorticoids (Fig. 1). Facial lesions were extensive with no area of healthy skin and a significant inflammatory reaction. In the blood cell count, leucolymphopenia (white blood cells 3700/mm^3, lymphocytes 520/mm^3, eosinophilic polynuclear cells 100/mm^3) and thrombocytopenia (59 000/mm^3) were noted. Direct examination of the scraping samples from the face and forearms enabled the identification of many parasites of the genus *Demodex* (more than five per field of optical microscope at low magnification). Histological examination of the dermis and epidermis showed foci of spongiosis and perifollicular lymphocyte infiltration, but no eosinophil infiltration.

An underlying immunosuppression was suspected and the diagnosis of human immunodeficiency virus (HIV) infection was confirmed by positive serology. The CD4 lymphocyte count was 81 cells/mL and the HIV load was 70 400 copies/mL. Oral metronidazole, 500 mg twice a day, and two applications/day of topical metronidazole were prescribed. After 12 days, a slight improvement of skin lesions was observed and antiretroviral treatment (ARV) was initiated. After 10 days of ARV treatment and 22 days of local and oral metronidazole treatment, an accentuation of pre-existing skin lesions with the appearance of new lesions on the face and forearms associated with a significant inflammatory reaction was observed. Clinical worsening and rapidly decreasing HIV load down to 724 copies/mL suggested the presence of immune reconstitution inflammatory syndrome (IRIS). While maintaining ARV treatment and metronidazole, the addition of corticosteroid therapy, prednisone 0.5 mg/kg/day, for 2 weeks resulted in gradual recovery.

Progress was favourable after 6 days of corticosteroid therapy, with a dramatic improvement of the skin lesions on the face and forearms. Metronidazole by local and systemic route was maintained for 2 months and corticosteroids for a total duration of 6 weeks. In the 3rd month of ARV treatment, despite an undetectable HIV load, the skin lesions reappeared, having exactly the same aspect as during the initially diagnosed demodicosis. Treatment with metronidazole and corticosteroids at the initial doses was resumed for a period of 2 months. Progress was marked by a gradual improvement; the lesions disappeared after 6 months (Fig. 1). During the 4-year follow up, control HIV load remained undetectable, with no relapse of demodicosis (Table 1).

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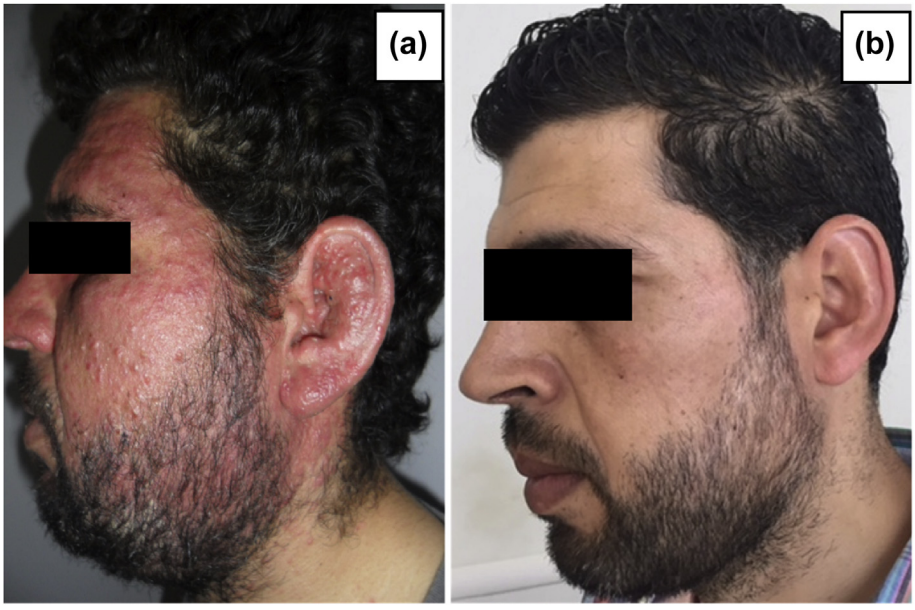

FIG. 1. Evolution of the demodicosis facial lesions. (a) Initial lesions before the start of treatment: maculopapular, pustular and squamous erythematous rash on the face associated with significant inflammatory reaction. (b) Entire disappearance of cutaneous lesions.

TABLE 1. Clinical data and treatment prescribed during the first weeks of patient management

	Day 0 (diagnosis of demodicosis)	Day 12	Day 22	Day 30	Day 60	Day 75	Day 135	Day 200
Clinical signs: cutaneous lesions	Rash on face and upper limbs	↓	↑ (IRIS ?)	↑	↓	↑↑	↓↓	No relapse
Blood cell count								
WC (/mm³)	2700		4500			8900		
Ly	500		585			1400		
Eo	100		0			0		
CD4 (/mm³)	81 (11.5%)			97 (12.4%)		338 (19%)	383 (20%)	442 (29%)
HIV load (copies/mL)	70 400			724		<20	<20	<20
Treatment								
Metronidazole (orally + topically)	→	→	→	→	→	→	→	
Antiretroviral		→	→	→	→	→	→	→
Prednisone (0.5 mg/kg/day)			→	→	→	→	→	

Abbreviations: BCC, blood cell count; Eo, polynuclear eosinophils; HIV, human immunodeficiency virus; IRIS, immune reconstitution inflammatory syndrome; Ly, lymphocytes; WC, white cells.
Evolution of skin lesions: ↓ Regression; ↑ Accentuation; ↓↓ Cessation; ↑↑ Recurrence.

We herein report a severe form of rosacea-like demodicosis that was an exceptional route to the discovery of an HIV infection. The other characteristic of our observation is the occurrence of an IRIS controlled by corticosteroid therapy.

The pathogenic role of *Demodex* remains controversial in humans because of saprophytism by this parasite [1,2]. *Demodex* cutaneous colonization is found in 10%–80% of asymptomatic individuals [3], increasing proportionally with age [3,4]. This correlates with the activity of the sebaceous glands, which increases after adolescence [3]. Nevertheless, numerous clinical pictures have been attributed to this mite defining demodicosis, which includes rosacea, perioral dermatitis, pustular or hyperkeratotic folliculitis, scalp erythema and blepharitis [2,4,5,6]. Pathogenically speaking, *Demodex* secretes a lipase that hydrolyses sebum triglycerides to glycerol and free fatty acids, which are irritating and comedogenic [5,7].

Positive diagnosis of demodicosis is usually established when the clinical picture is evocative and when the presence of a large number of parasites is detected by parasitological examination. These mites are considered pathogenic when the density is more than five *Demodex*/cm^2 of skin surface or by low-magnification optical microscope field [8,9]. The response to an acaricide treatment is an additional argument for retaining the diagnosis. Demodicosis occurs in both immunocompetent and immunocompromised individuals with a higher frequency in the latter. Several studies suggest that immunological deficiency favours an increase of this mite population. Indeed, several cases of demodicosis in association with haematological malignancies, immunosuppressive therapy and HIV infection have been described in literature [4,7,10,11].

Demodicosis seems to be an opportunistic ectoparasitosis. As reported here, demodicosis occurs in HIV-infected individuals with a CD4 count <200/mm^3 [4,10]. In immunocompetent individuals, demodicosis is most often associated with papular, papulopustular or nodular pruriginous elements of the face. The semiological appearance remains unchanged in HIV-infected individuals, but the rash may be more profuse and extend to the back, the pre-sternal region and the upper limbs [10,11]. There are no standardized recommendations for the treatment of demodicosis. Many molecules are used locally in this indication: permethrin, lindane, crotamiton, benzyl benzoate or metronidazole [10–13]. The two first-line systemically used molecules are ivermectin and metronidazole [5,9,10,13]. Clinical cure can be achieved by the isolated prescription of a local treatment.

Nevertheless, in some cases, the presence of diffuse lesions or underlying immunosuppression justifies the systemic treatment [5,13]. The positive therapeutic response is often attributed to the use of single-dose ivermectin at 200 mg/kg [10,12,13]. Ivermectin was not available for our patient, so the treatment was based on metronidazole, which was maintained for a prolonged period due to slow progression and an initial worsening after 12 days of the onset of ARV therapy, which may be explained by IRIS. This has been revealed by demodicosis in some cases of HIV-infected individuals reported in the literature, where ivermectin treatment was sufficient without corticosteroids [12,13]. The delay between the beginning of ARV therapy and the occurrence of demodicosis in these individuals varied from a few days to a few weeks [12,13]. The reappearance of skin lesions 15 days after discontinuation of metronidazole and corticosteroids in our case could be explained by the relative ineffectiveness of the anti-mite treatment used. The re-occurrence of the IRIS could also be involved. The rapid increase in CD4 count from 97 to 338/mm^3 in less than 2 months was in favour of the latter hypothesis.

After a review of the literature, our observation represents the first description of a demodicosis revealing HIV infection. The optimal delay between the beginning of the anti-parasite treatment and the ARV treatment, to prevent the occurrence of IRIS, has not yet been determined. However, the relatively mild nature of this skin infection compared with other opportunistic infections such as tuberculosis, toxoplasmosis or cryptococcosis has prompted us to start ARV treatment quite quickly in demodicosis individuals with a low CD4 count.

Demodicosis in its extended form could be considered an opportunistic skin infection that may reveal HIV infection. The delay between the anti-parasite treatment and the beginning of the ARV treatment is not yet codified, with the risk of occurrence of an IRIS complicating the patient management.

Conflict of interest

There is no conflict of interest.

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