A case of crusted scabies with a delayed diagnosis and inadequate therapy

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SUMMARY

Crusted scabies is an infrequent disease caused by *Sarcoptes scabiei* that usually affects patients with underlying medical conditions leading to immunosuppression.
Here, we present the case of an 81 years old man, diagnosed with crusted scabies who came to our attention after multiple misdiagnosis and incorrect and potentially detrimental treatment with steroids. He was admitted to our inpatients ward and treated with oral ivermectin plus local permethrin. The hospitalization was complicated by a secondary bacterial skin infection caused by methicillin-sensitive *Staphylococcus aureus*.

Crusted scabies is commonly misdiagnosed in elderly and immunosuppressed people due to its unusual occurrence and atypical clinical presentation. It should be considered in the differential diagnosis of skin lesions associated with pruritus in patients with underling medical conditions leading to immunosuppression. A prompt diagnosis and treatment are warranted due to the potential secondary infections and subsequent related morbidity and mortality.

Keywords: crusted scabies, immunodepression, steroid therapy, ivermectin, permethrin.

INTRODUCTION

Crusted scabies (previously named "Norwegian" scabies) is a rare clinical entity that could occur when an immunosuppressed patient is infected with *Sarcoptes scabiei* [1].
Classic scabies is characterized by diffuse severe itching (especially during night hours) associated with skin manifestations such as erythematous papules scattered all over the body with preferential locations (*i.e.* interdigital area, peri-umbilical area and genitals) [2]. On the other hand, the clinical presentation of crusted scabies is often characterized by weak or absent prurigo. The skin lesions are usually represented by defined, erythematous plaques covered by scales and crusts, which are diffused on the whole-body surface [2].
The clinical manifestations of crusted scabies vary according the degree of immunosuppression. Among risk factors related to the development of the disease should be mentioned diseases primarily leading to immunosuppression (*i.e.* AIDS and malignancies) and iatrogenic immunosuppressive conditions (*i.e.* high-dose steroids) [3, 4].
The diagnosis of crusted scabies requires a high clinical suspicion and should be supported by microscopic examination of a skin sample (scraping) demonstrating mites' presence [5].
Due to its infrequent occurrence and due to the absence of the hallmarking skin lesions of classic scabies, crusted scabies is often overlooked or

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misdiagnosed [6, 7]. Thus, the late presentation of the patient, after unsuccessful or dangerous treatments, with secondary bacterial infections is not infrequent [8].
Here we present the case of a man with a late crusted scabies diagnosis complicated by previous inadequate treatments.

CASE REPORT

We present the case of an 81 years old man, born in Italy, who presented himself at our emergency department (ED) in late August 2019 because of multiple crusted lesions affecting him from more than a year, extremely itchy and unresponsive to multiple topical and systemic treatments (Figure 1 A-B-C-D).
The patient reported suffering from an itchy dermatitis since September 2018. At the beginning of the present illness, the lesions had the appearance of itchy, erythematous papules, almost located at genitals and interdigital areas of the fingers and subsequently extended to the whole body. He was evaluated by several dermatologists and underwent multiple cycles of topical antihistaminic and steroidal therapies without benefits. From March to May 2019 the patient was admitted for 41 days to another hospital due to congestive heart failure and infective spondylodiscitis (without etiological diagnosis). During the hospitalization, due to the presence of dermatitis and high absolute eosinophil count (5270/mcl) he was examined by an allergology specialist who diagnosed a Drug Rash with Eosinophilia and Systemic Symptoms (DRESS Syndrome) probably related to concurrent lipid-lowering medications. He prescribed topical and systemic steroid treatment with methylprednisolone 20 mg three times a day for three days then tapering over weeks. Because of the complete lack of benefits after a month of steroid therapy, he was then referred to a dermatologist, who decided to perform a skin biopsy (punch biopsy), which visualized arthropods morphologically similar to scabies mites and lesions histologically compatible with scabies dermatitis. The patient then referred to another dermatologist at the beginning of July, who prescribed systemic therapy with albendazole 400 mg per day for 8 days.
On physical examination performed at our ED, the patient presented broad crusted lesions that interested the whole body more prominent on the face, trunk, groin, and limbs. Due to the nature of the lesions, scraping of the skin was performed and sent to the microbiology department for microscopical examination, revealing the presence of *Sarcoptes scabiei*. A diagnosis of crusted scabies was made. Blood tests were also performed, showing slight C reactive protein elevation (48 mg/L), mild leukocytosis (10,400/µL) and slight elevation of lactate dehydrogenases (282 IU/L), mild elevated absolute eosinophil count (810/µL). The patient medical history showed coronary arteries disease, hypertension and a history of prostate cancer (treated with radical prostatectomy). At the time of ED presentation, he was still tapering methylprednisolone with a daily intake of 7.5 mg.
The patient was subsequently admitted to our inpatient infectious disease unit. Lymphocyte phenotyping showed an iatrogenic immunosuppression, with a CD4+ lymphocyte count of 130 cell/µL. The patient tested negative for HIV infection.

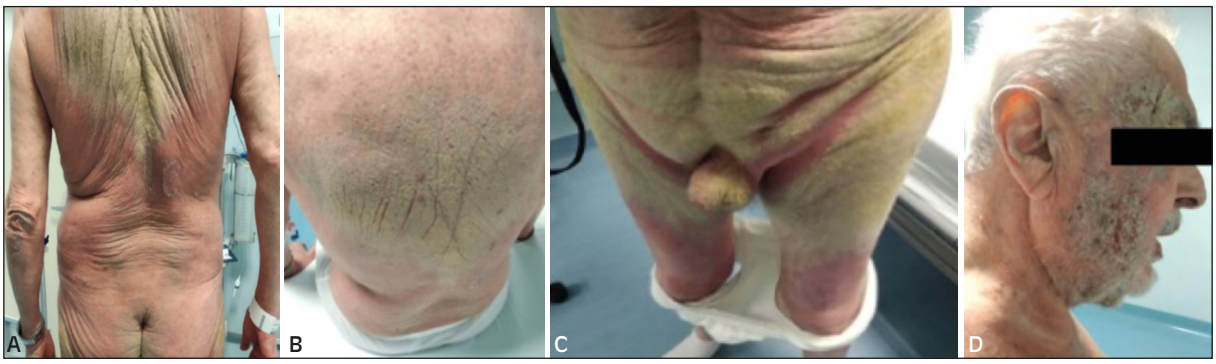

Figure 1 - A-D: patient's appearance at hospital presentation.

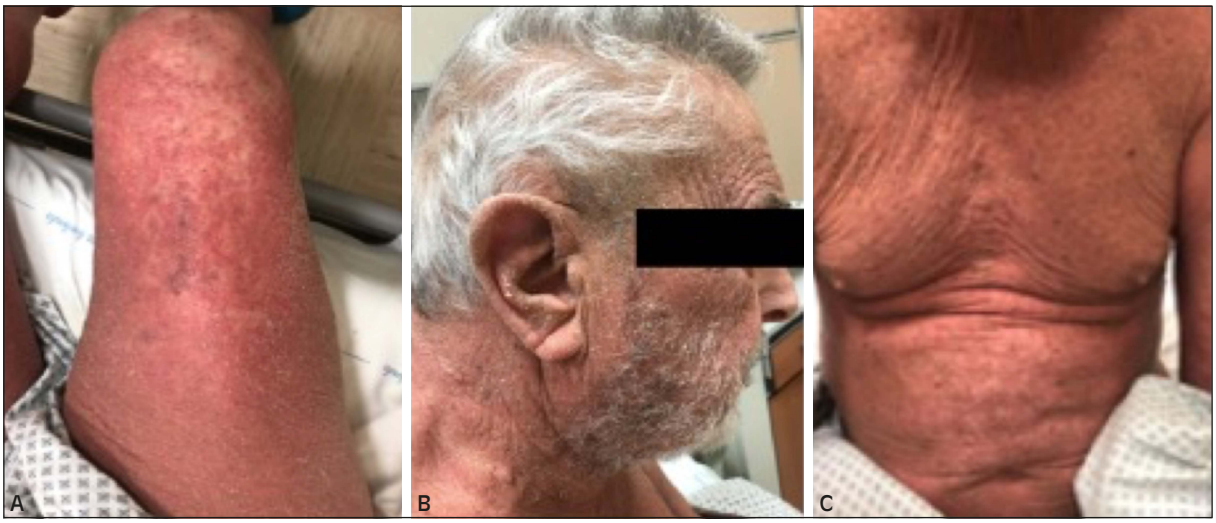

Figure 2 - A-C: patient's appearance after treatment.

He underwent specific treatment with both systemic therapy with ivermectin 200 mcg/kg on days 1, 7, 9 and 15 and topical therapy with permethrin 5% cream on the whole body followed by permethrin baths on day 1, 2, 14 and 15 (Figure 2, A-B-C).

The patient was followed up with seriate microscopic examinations of skin samples, which showed the presence of live *Sarcoptes scabiei* mites on days 2, 4 and 10 from the beginning of treatment. The first sample which tested negative was obtained on the 15th day of treatment.

Hospital course was complicated by superinfection of lower limbs scabies' lesions due to methicillin-sensible *Staphylococcus aureus*, which was treated with parenteral oxacillin 2 g every 4 hours, followed by oral cotrimoxazole. The hospitalization was further complicated by atrial fibrillation, congestive heart failure and acute pulmonary edema. Moreover, the patients suffered for a hospital-acquired pneumonia due to MDR *Pseudomonas aeruginosa*.

He was discharged after 71 days to a rehabilitation clinic. The lymphocyte phenotyping performed before the discharge showed CD4+ lymphocyte count of 451 cells/µL.

It is worth mentioning, that patient's wife was diagnosed with localized scabies and treated only with topical therapy with 5% permethrin cream on days 1 and 7 with complete resolution of symptoms.

DISCUSSION

We describe a case of an overlooked crusted scabies in an elderly man complicated by long-term steroid therapy due to initial misdiagnosis leading to severe complications and prolonged hospitalization.

Despite reaching approximately 70% of prevalence in the poorest regions of the world, the diagnosis of scabies, even in its typical form, is often missed in high income countries, where the disease affects almost only homeless people [10, 11].

Crusted scabies is a clinical entity characterized by atypical presentation, involvement of unusual sites, and frequent bacterial superinfections further complicating the diagnostic workflow. Since scabies usually affects people belonging to lower socio-economic classes in high income countries, the possibility of this disease in people of higher socio-economic status is often overlooked, possibly delaying diagnosis to a greater extent [10, 12].

The clinical onset with erythematous and itchy papules, localized in typical areas, severe eosinophilia, clinical worsening after the administration of steroid therapy should have helped the physicians in charge of the patient to put scabies among the differential diagnosis [4]. The diagnosis of crusted scabies should always be suspected evaluating a patient with iatrogenic immune system impairment and a history of long-standing itching and skin lesions [6, 7].

As reported in the literature, crusted scabies is favoured by many clinical conditions such as malignancy, transplant or autoimmune disease; iatrogenic immune impairment due to steroids or other immunosuppressive therapies, such as the case of our patient, is also often reported as a risk factor [8, 9]. In fact, although our patient showed no signs of immune system impairment at disease onset, the prolonged administration of high steroid doses produced a profound iatrogenic immunosuppression and allowed the scabies mites to multiply. Thus, the disease evolved from classic scabies to crusted scabies [3, 4].

Roberts and colleagues analysed a cohort of seventy-eight patients from Aboriginal communities in Australia to assess the risk factors related to crusted scabies [3]. Although the majority of patients had a definite risk factors (*i.e.* transplants, diabetes mellitus, HTLV-1 infections, heavy alcohol use and previous leprosy) one third of patient had no identifiable risk factors [3].

Our patient underwent a prolonged course of high dose steroids. The steroid treatment not only was ineffective, but likely worsened the mite burden and the course of the disease by causing the patient's immune system impairment.

Even after a correct diagnosis, a dermatologist specialist prescribed a course of albendazole plus steroids. Although three cases of patients with scabies treated with albendazole have been reported in the literature, this treatment is not recommended by any guideline [13-15]. It is mandatory to quickly identify any form of complications which can occur in a patient affected by crusted scabies. The most frequent complication observed in patients with scabies, and more commonly in crusted scabies, is bacterial superinfection [2, 3]. Bacterial infections, mainly caused by *S. aureus* and *Streptococcus pyogenes*, are often reported in literature [2, 5, 6]. These kinds of infections are usually limited to the skin. It is possible, however, that in our patient, the administration of steroids worsened not only scabies but also predisposed to the subsequent bacterial infection.

Regarding the treatment, we administered a combination of topical plus systemic therapy [15-17]. Systemic ivermectin, as reported in the European guidelines, is pivotal to treatment success [15]. Although there are no randomized controlled trials comparing treatment with ivermectin *versus* other topical treatments for crusted scabies, studies conducted in northern Australia have shown that multiple doses of oral ivermectin associated with topical permethrin are effective [3, 18].

In conclusion, crusted scabies should always be considered in patients presenting with diffused crusted skin lesions, with known or suspected immune system impairment by any cause (including iatrogenic causes). Awareness and early recognition are of paramount importance for a correct diagnosis, which limits incorrect treatments and secondary complications.

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Conflict of interest

All the authors declare no conflict of interest related to the present manuscript.

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