

# Crusted Scabies in a Malnourished Patient: A Rare Case Report

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## Abstract

**Introduction:** Scabies is a parasitic skin condition, with crusted scabies (CS) being a severe and highly contagious variant characterized by thickened skin lesions and a high mite count. CS is typically associated with immunocompromised individuals but can also develop in those suffering from malnutrition, as malnutrition weakens immune responses and impairs skin integrity.

**Case Presentation:** We report a case of CS in a 50-year-old malnourished male with no history of scabies or systemic disease, recently incarcerated. He presented with widespread itching, hyperkeratotic papules on the palms and soles, and secondary impetigo. The patient showed signs of malnutrition, with a BMI of 15.6 kg/m<sup>2</sup> and muscle wasting. *Sarcoptes scabiei* mites, eggs, and scybala were identified microscopically. The case was classified as Grade 3 CS. Treatment included two doses of ivermectin (8 mg) one week apart, 10% sulfur ointment, and benzyl benzoate soap. Follow-up was incomplete, highlighting challenges in managing socially vulnerable patients.

**Discussion:** This case emphasizes the importance of early recognition, accurate diagnosis, and effective treatment of CS, especially in settings with poor sanitation and overcrowding. The patient's malnutrition likely contributed to the severity of the condition, as compromised immunity can facilitate mite proliferation.

**Conclusion:** A holistic approach addressing malnutrition, sanitation, and patient education is crucial in managing CS in resource-limited settings.

## Keywords

Crusted scabies, Norwegian scabies, *sarcoptes scabiei*, malnutrition

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## Introduction

Scabies is a common parasitic skin infestation leading to intense itching and inflammatory skin lesions. It is transmitted through prolonged skin-to-skin contact.<sup>1</sup> Scabies is classified as a neglected tropical disease (NTD) according to the world health organisation (WHO).<sup>2</sup> Scabies is endemic in tropical and subtropical regions, whereas in industrialized countries, it typically occurs in sporadic cases or institutional outbreaks. Poverty and overcrowded living conditions are key risk factors for scabies, while sex, race, age, and socioeconomic status do not significantly affect its prevalence.<sup>1</sup>

CS, also known as hyperkeratotic or Norwegian scabies, is a severe and highly contagious form of scabies characterized by extensive hyperkeratotic lesions and a heavy burden of *Sarcoptes scabiei* mites. Compared to classic scabies, it presents with more severe symptoms, including widespread scaling, thick hyperkeratosis, and crusted lesions that may be either loose and flaky or thick and adherent.<sup>1,3,4</sup>

CS and classic scabies are both caused by the same organism, *Sarcoptes scabiei* var. *hominis*, which belongs to the phylum Arthropoda, class Arachnida, order Acarina, and superfamily Sarcoptes.<sup>3</sup> The life cycle of the human scabies mite starts with a pregnant female burrowing into the skin to lay eggs, with larvae maturing into adults within 2 weeks and perpetuating the cycle. Transmission mainly occurs through direct skin contact, although mites can survive on surfaces for up to 36 hours, allowing for possible indirect transmission. However, studies suggest indirect transmission is uncommon, except in severe CS cases where high parasite loads can increase the likelihood of spread via contaminated bedding or clothing.<sup>1</sup>

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CS is a rare and severe form of scabies, with limited cases documented in the medical literature. Few cases have been reported in Syria. We report an exceptional case of CS in a patient with a history of malnutrition.

## Case Presentation

A 50-year-old male arrived at the dermatology clinic with a one-month history of widespread nocturnal pruritus that spared the scalp. Physical examination revealed excoriated and hyperkeratotic papules initially appeared in the interdigital spaces between the fingers, distributed across the body including the palms and soles. There were also areas of scaling on the palms and soles. Secondary impetigo was detected. No mucosal or nail involvement was observed. The patient's social history indicated a recent period of incarceration. The patient demonstrated clinical signs of malnutrition, including a BMI of 15.6 kg/m<sup>2</sup> (height: 160 cm, weight: 39.9 kg), significant muscle wasting, and generalized fatigue. The patient denied any history of systemic or immune-related diseases. The patient has no medical, surgical, family or pharmacological history.

A microscopic examination of scrapings from the hyperkeratotic lesions revealed an abundance of *Sarcoptes scabiei* mites, along with numerous eggs and scybala. The diagnosis was confirmed through a combination of clinical presentation and microscopic findings. The complete blood count showed a mildly elevated white cell count, with increased neutrophils and monocytes. Platelets were within the normal range, and hemoglobin was slightly low. HbA1c indicated normal blood sugar levels. Antibody tests for HIV-1 and HIV-2 were negative. Antibodies for Hepatitis B and C also showed negative results. CD4, CD3, and CD8 counts were within normal ranges. The case was classified as Grade 3 CS, with severe crusting and scaling affecting over 30% of the total body surface area (TBSA). The crusting extended beyond the hands and feet, but there were no prior scabies episodes or extensive skin damage (Figures 1–3).

The patient was managed with a combination of systemic and topical treatments. Ivermectin was administered at a dose of 200 micrograms per kilogram of body weight (8 mg), with an initial dose of three tablets taken together before breakfast, followed by a second dose 1 week later. Hydroxyzine (25 mg) was prescribed for nighttime use to alleviate pruritus. For topical treatment, 10% sulfur ointment was applied to the affected areas to target the scabies mite, while benzyl benzoate soap was recommended for body washing to minimize skin irritation and reduce the risk of reinfection. The patient was also instructed on proper hygiene practices and the importance of treating any close contacts to prevent reinfection. Family members and close contacts were advised to receive treatment to prevent reinfection and reduce the risk of transmission. The patient was discharged after a seven-day stay due to the unavailability of an appropriate isolation unit and did not return for follow-up. The patient adhered to the treatment regimen during the seven-day hospital stay under medical supervision; however, adherence post-discharge could not be confirmed due to the lack of follow-up.

## Discussion

Scabies progresses in two main forms: classic scabies with fewer mites, and severe forms like profuse and CS, which often affect immune-compromised patients. CS, the most severe, involves a high mite burden, making it highly contagious, particularly in outbreaks. Both forms can cause physical and psychological harm, with untreated CS potentially fatal.<sup>5</sup>

CS is characterized by large, thick, yellow-brown to creamy-gray lesions, caused by a high concentration of mites stimulating excessive keratin production. Commonly affected areas include the hands, feet, neck, scalp, face, and trunk. The diagnosis of scabies, including CS, is confirmed by identifying the mite, its eggs, or feces. Traditional diagnosis involves inspecting the contents of burrows under a microscope. Dermatoscopy offers a faster, noninvasive alternative with high sensitivity and specificity, revealing key signs such as the “kite sign” and “wake sign.” However, distinguishing live mites can be challenging, and advanced techniques like videodermoscopy and confocal microscopy, though more accurate, are limited by cost and complexity. Histopathological examination can further confirm the diagnosis, showing serpentine burrows in the epidermis containing all mite stages, including eggs, larvae, nymphs, and adults.<sup>3,6</sup> In our case, the patient experienced itching for 1 month, beginning in the interdigital spaces and spreading across the body, sparing the scalp. Physical exam revealed excoriated, hyperkeratotic papules on the body, palms, and soles, along with scaling and secondary impetigo. Microscopic examination confirmed the presence of *Sarcoptes scabiei* mites, eggs, and scybala.

CS is categorized into three grades based on distribution, crust severity, previous episodes, and overall skin condition. Grade 1 is mild, limited to <10% TBSA with minimal crusting and no history of recurrent scabies. Grade 2 indicates moderate severity, involving 10–30% TBSA, moderate crusting (5–10 mm depth), and possible past episodes. Grade 3, the most severe, covers >30% TBSA with profuse crusting (>10 mm depth), often with multiple past episodes and extensive skin damage.<sup>5</sup> In our case, the patient's presentation aligns with Grade 3, showing widespread crusting beyond the hands and feet, with thick, scaling lesions on the palms, soles, and other areas of the body, alongside secondary impetigo. Despite the severity, he had no prior scabies episodes, no immune compromise, and no extensive skin damage, which guided us in opting for both systemic and topical treatment to address his infection effectively and prevent reinfection.

While classic scabies is the most common form in the country, only 13 cases of CS have been documented.<sup>7</sup> Secondary bacterial infections, primarily caused by *Staphylococcus aureus* and *Streptococcus pyogenes*, are significant complications of scabies, often leading to impetigo, which affects approximately 15% of scabies cases in Syria. In severe cases, such as CS, these infections can progress to septicemia, posing a high risk of mortality. Timely treatment with ivermectin has been shown to improve outcomes by eradicating the infestation, reducing the risk of secondary infections, and preventing severe systemic complications.<sup>5,7,8</sup>

The humanitarian crisis in Syria has exacerbated the spread of scabies, particularly within overcrowded, resource-poor environments like camps and prisons, where limited sanitation significantly increases transmission risks. The spread of scabies, especially CS, among close contacts is highly contagious, even through brief or indirect contact with skin, clothing, or bedding. Prophylactic treatment is crucial to prevent further transmission. A case report by Wang et al<sup>9</sup> highlighted scabies transmission among close contacts, including immunocompetent individuals. Contact tracing has shown outbreaks involving families and health-care workers, underscoring the importance of early identification, strict infection control, and preventive treatment for exposed individuals.<sup>7,9</sup>

CS is associated with risk factors that compromise immunity or reduce the ability to scratch, leading to aggressive mite proliferation. These include immunosuppressive conditions (e.g. HIV, malignancies, and diabetes), immunosuppressive treatments commonly used in organ transplantation (e.g. corticosteroids, cytotoxic drugs, calcineurin inhibitors, azathioprine, and mycophenolate compounds, which disrupt T-cell activity), malnutrition, physical or cognitive impairments as in Down syndrome, Neurological sensory impairment, and extremes of age. Such conditions facilitate hyper-parasitisation, with mite numbers potentially reaching up to 1 million in severe cases.<sup>4,5,9</sup> The primary risk factor for the progression of scabies to crusted variant in our case is malnutrition. Malnutrition can worsen scabies by weakening the immune response, leading to a milder rash and making diagnosis harder. It also compromises skin integrity, increasing the risk of secondary bacterial infections like impetigo, which can complicate the condition. This is further exacerbated by the patient's incarceration, during which he was exposed to unsanitary conditions and overcrowding, increasing the likelihood of scabies transmission. Managing CS effectively requires addressing these underlying risk factors through a holistic approach that includes nutritional support, patient education on hygiene, and reinfestation prevention strategies. While the majority of reported cases of CS are associated with co-occurring medical conditions such as diabetes, HIV, and Down syndrome, our patient presents with an unremarkable medical history.<sup>3,6</sup>

In our case report, the management of CS followed evidence-based protocols by combining systemic and topical treatments. We administered ivermectin in a dosing schedule of an initial single dose with a repeat after 1 week, which aligns with studies indicating that multi-dose regimens are essential for complete mite eradication in severe infestations. Studies show that ivermectin, especially in multi-dose regimens or combined with permethrin, has an 87% success rate in CS.<sup>3,6,7,9,10</sup> Topical keratolytics are vital in treating CS, as they remove thick crusts and enhance scabicide penetration. Agents like 5%–10% salicylic acid or 40% urea improve treatment efficacy and can be used on non-scabicide days. Therefore, a comprehensive treatment regimen for CS should include both systemic agents like ivermectin and appropriate topical keratolytics to ensure optimal outcomes.<sup>11,12</sup>



**Figure 1.** The back and anterior trunk reveal widespread hyperpigmented, crusted papules with excoriations and scaling, consistent with CS. The skin appears rough, thickened, and shows scattered red-brown spots likely from scratching.



**Figure 2.** Excoriated, thickened, and scaly lesions on palms and soles, with secondary impetigo.

## Conclusion

This case underscores the severe impact of CS, a highly contagious form of scabies often exacerbated by social factors such as malnutrition, overcrowding, and poor sanitation. Although rare, CS poses significant health risks and can spread rapidly in vulnerable populations, highlighting the importance of early recognition, accurate diagnosis, and a holistic management approach. Addressing underlying risk factors, enhancing patient education, and ensuring continuity of care are essential steps to improve outcomes and prevent recurrence, especially in resource-limited settings.





**Figure 3.** Posterior neck and scalp show scaling and hyperpigmented papules, consistent with CS.

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None

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## Statements and Declarations

### Ethical Considerations

Ethical approval was not required for this case report, as it involves a single patient and does not meet the criteria for research requiring institutional review board (IRB) oversight. The use of authorized medications was consistent with clinical practice guidelines, and the management of this individual patient did not require IRB approval.

### Consent

Written informed consent was obtained from the patient prior to publication of this case report and any accompanying images. This consent includes permission for the use of unauthorized, off-label medications as part of the treatment plan. The completed consent form is available to the Editor upon request and will be treated confidentially.

### Author Contributions/CRedit

1. Lina Al-Soufi: Conceptualization, Supervision, Study Design, Writing – Review & Editing.
2. Aya Marashli: Data Curation, Formal Analysis, Writing – Original Draft, Writing – Review & Editing.
3. Mohammad Adi: Formal Analysis, Writing – Original Draft, Writing – Review & Editing, Contributions to Discussion.

4. Zuheir Al-Shehabi: Methodology, Data Interpretation, Approval of Final Manuscript, Supervision.

All authors have reviewed and approved the final manuscript and are accountable for its accuracy and integrity.

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### Data Availability

All data pertinent to this case report have been included in this article. Further inquiries can be directed to the corresponding author.

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