

Canine Scabies in Humans: A Case Report and Review of the Literature

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Key Words

Canine diseases · Scabies · Zoonoses · Parasitic diseases · Dermoscopy

Abstract

Background: *Sarcoptes scabiei* causes mange in many domestic and wild mammals, and it has been reported to be transmitted from animals to humans. Canine scabies is known to infest humans, as well. **Case Report:** We report a 27-year-old woman who presented with severe pruritic papules on the trunk and arms. The patient reported that she had just bought a puppy which was also itchy. Direct microscopy from the dog showed scabies mites. The patient was treated by 5% permethrin which accomplished full recovery. **Discussion:** Canine scabies in humans is a challenging disease to diagnose since mites are hard to find on skin scrapings of dogs and the burrows that are the hallmark of scabies are absent. Dermatological examination of the lesions in our patient did not show any burrows or a specific dermoscopic image of scabies. Instead, we observed curvilinear crusts on most of the papules. **Conclusion:** To our knowledge, dermoscopic appearance of canine scabies in humans has not been described before. We think this special pattern of excoriations is the result of superficially dug tunnels that had been torn leaving vacant curved linear remnants behind, and this may provide a good support for the diagnosis of canine scabies contributing to the spectrum of entodermoscopy.

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Sarcoptes scabiei causes sarcoptic mange in animals. It affects a number of domestic and wild mammals including dogs, pigs, horses, camels, black bears and monkeys [1]. Likewise, it has also been recorded in the dingo, wild fox and wombat in Australia [2]. In sum, 40 different mammalian hosts have been reported to be infested by the mite [3]. Studies show that the mite has different but related strains compatible with various host requirements. So far, there are a number of reports on transmission of the disease from animals to humans [1]. Human infestation with canine scabies is one of the most frequent zoonoses due to close contact of people with dogs [3]. However, definitive diagnosis of the disease requires much effort. Hence, it is probably underdiagnosed in daily practice. Herein we report canine scabies in a young woman and document both clinical and dermoscopic findings which can aid in the accurate diagnosis.

A 27-year-old woman presented with severe pruritic papules that had been present for a couple of days. She had noticed the first lesions on the abdomen spreading to involve the breasts and arms. The patient reported that 1 week earlier, she had bought a puppy which was also itchy. Dermatological examination revealed 3- to 4-mm erythematous, excoriated seropapules on the trunk and arms (fig. 1a). The lesions were discrete on the forearms but more or less confluent elsewhere. Under the dermoscope, the most salient finding was the presence of curvilinear crusts over a yellow background. Long excoriations

were coarsely serrated reminiscent of burrows (fig. 1b). Direct microscopy from the scrapings of the puppy showed *S. scabiei* (fig. 1c, d). The puppy was treated with ivermectin, and the owner was given symptomatic treatment. However, the patient's itching got worse and new lesions appeared to involve the neck. After a follow-up of 1 week, she was treated with 5% permethrin which accomplished full recovery.

Canine scabies caused by *S. scabiei* var. *canis* is very contagious among dogs, representing 2–4% of the dermatology cases. Observations indicate that puppies or old and debilitated dogs are more at risk, particularly those that are undernourished and heavily parasitized. The life cycle of *S. scabiei* var. *canis* takes place exclusively on dogs, passing from egg to larva, in 2–3 weeks. Severe itching accompanied by lesions spreading over the ventral abdomen, chest, elbows, legs, hocks and ears is encountered [1]. Lesions consist of follicular papules, yellow crusts of dried serum and excoriations from scratching due to intense pruritus. Secondary bacterial infections are frequent complications [4]. Chronic infestation leads to generalized hair loss and thickening, hyperpigmentation and wrinkling of the skin causing a 'leather dog' appearance [1]. Mites can survive off the host in sleeping areas and on grooming equipment, which should also be considered as potential sources of contamination [4].

Canine scabies in humans is a challenging disease to diagnose since it does not

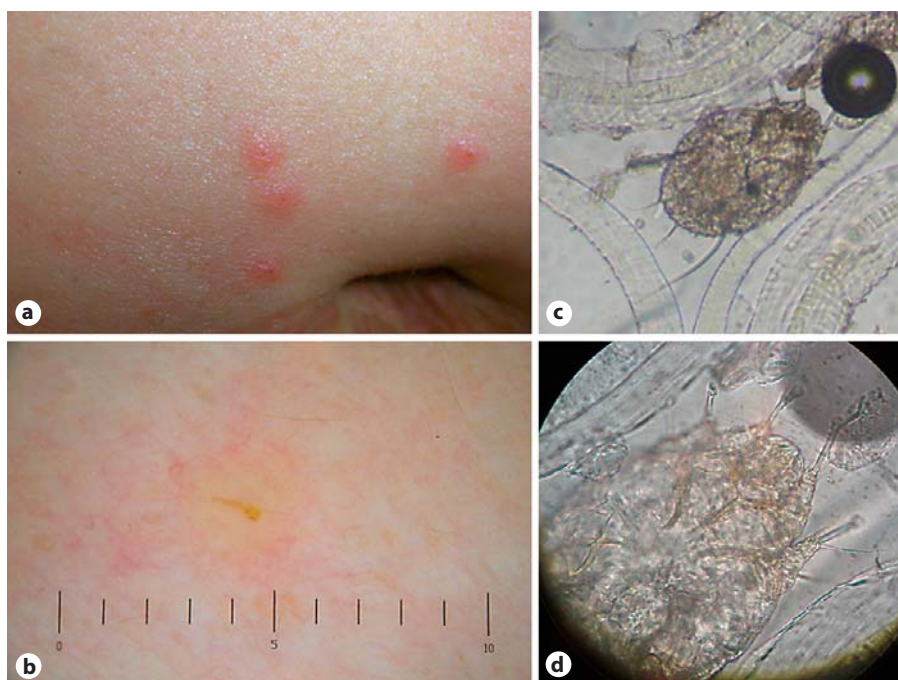


Fig. 1. **a** Three- to 4-mm erythematous, excoriated seropapules on the umbilicus. **b** Dermoscopic image of a papule showing a curvilinear crust over a yellow background. **c, d** Direct microscopic image of *S. scabiei* mite including a higher magnification.

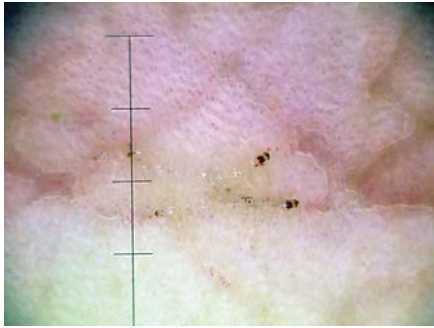
show diagnostic clinical findings, and sarcoptic mites are hard to find on skin scrapings of dogs. Direct parasite search with microscopic examination should be performed on dogs. However, mites can only be found in approximately 50% of cases. The accuracy of the diagnostic procedure depends on the sample area and number of skin scrapings examined. Up to 10 scrapings are advised per case [4]. Although the incidence of canine scabies in humans is not known, it is probably not rare [5]. The disease differs clinically from scabies induced by *S. scabiei* var. *hominis*. For example, the distribution of the lesions is atypical in canine scabies. Another difference is the shorter incubation period of 24–96 h [1, 5]. The clinical findings also differ in severity and course, tending to be milder and transient in nature. Finally, since canine scabies does not reproduce on human skin, the burrows that are the hallmark of scabies are absent [2, 6]. In our case, the clinical findings of slightly raised papules, the distribution of the lesions limited to the contact areas and the short incubation period were all compatible with the canine scabies, and we were able to detect the mite after 40 min of diligent search.

The pathophysiology of canine scabies in humans and the specific contribution of the mite have not been completely clarified, yet. In fact, *S. scabiei* var. *canis* and

hominis are both 0.2–0.4 mm in length and transparent except for the pigmented mouth and anterior legs. However, lack of trunkal ridges and spines in *S. scabiei hominis* is an established morphological difference [4]. Furthermore, there is at least one study showing that the mites from dogs and humans are genetically distinct [7]. Actually, despite showing phenotypical and genotypical differences both mites are able to infest human skin. Yet, they behave differently according to the host. The canine strain is able to burrow in dog skin, while it cannot survive naturally to do so in the human skin. There is only one report of experimental canine scabies in humans showing evidence of burrowing in human skin. However, on this occasion 14 adult female mites were placed on a plastic disk with raised edges, glued with methacrylate to the armpit of 2 volunteers and wrapped with an elastic bandage for 96 h. In the end, erythematous, edematous papules and even vesicles were produced as a result. Skin biopsies demonstrated burrowing mites and eggs within the stratum corneum [8]. In any case, it appears best to keep in mind that these constraining conditions might have facilitated burrowing when compared to the natural environment. Furthermore, studies on survival of the mites showed some conflicting results. At 34°C, even below body temperature all

mites died within 24 h [9]. Eventually, it seems that even if the canine strain has the capacity to burrow in the skin, it seldom finds the required circumstances to go deep and stay long enough for reproduction.

Dermoscopy is a useful tool for the diagnosis of human scabies, and Argenziano et al. [10] were the first to report on this matter. The typical appearance of a small dark brown triangular structure which corresponds to the mite's head and 2 pairs of forelegs has been compared to a delta-wing jet [10]. The posterior part including the abdomen and hind legs appears translucent and is subsequently not seen by dermoscopy [11]. Sometimes the contour of the round body of the mite can also be identified [12]. The burrow of the mite – often shaped like an 's' or 'z' [12] – correlates dermoscopically with the 'contrail feature' eventually revealing multiple small brown dots, with the latter corresponding to fecal pellets [11]. There are other studies verifying these data [13–15]. The presence of a 'jet with contrail' image representing the mite and its burrow has been reported to be 91% sensitive and 86% specific in the diagnosis of scabies [16]. Figure 2 shows the typical dermoscopic image of scabies. Dermatological examination of the lesions in our patient did not show any burrows or a specific dermo-



Color version available online

Fig. 2. Typical dermoscopic image of 'jet with contrail' in human scabies. Original magnification $\times 10$.

scopic image of scabies. Instead, we observed curvilinear crusts on most of the papules. We think the special pattern of excoriations seen in our patient is the result of superficial settlement of the mite, probably in tunnel-like structures that have been torn easily, leaving vacant curved linear remnants behind.

The infestation of canine scabies is usually described as self-limited, clearing spontaneously over several weeks [4, 6]. Treatment of the affected dog is all that is required [5]. The coat should be clipped and crusty lesions and scales should be re-

moved with an antiseborrheic shampoo [4]. Systemic treatment is considered as the best approach for the management of scabies in dogs. So far, ivermectin, imidacloprid, milbemycin, moxidectin and selamectin have all been used [4]. All dogs having contact with infested dogs should be treated. Reinfestation may possibly occur, since mites are able to survive off the host for 24–36 h at room temperature [1], but for 19 days at 10°C [9]. Low temperature and high relative humidity prolong mite survival. Potential sources of contamination should be disinfected, including bedding, brushes and combs [4]. In our case the puppy was treated by ivermectin, known as a rapidly responsive drug, which produced complete resolution of signs and symptoms within 2 weeks. However, it should be kept in mind that the first cases of canine scabies refractory to ivermectin treatment have been reported recently [17]. Treatment of human contacts of animal scabies has been found to be unnecessary in the past; supported by experimental data showing only limited cross-infestivity between different host species [18]. However in our patient, symptomatic treatment was not enough to relieve severe pruritus causing sleep disturbance. Upon appearance of new lesions, the patient was treated with 5% permethrin. We think instead of waiting spontaneous resolution

for several weeks, it is prudent to treat and comfort the patient after confirmation of the diagnosis.

Finally, the presented case is another example of canine scabies infestation in humans. When compared with scabies, the canine variety produces a different but nonspecific clinical picture in humans. Confirmation of the diagnosis depends on the demonstration of the mite which is really demanding. The dermoscopic appearance of canine scabies in humans has not been described before. In this case, the repeated pattern of curvilinear crusts seen under the dermoscope has been assessed as a clue to canine scabies. In conclusion, we think dermoscopy may provide a good support for the diagnosis of this entity contributing to the spectrum of entodermoscopy.

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Disclosure Statement

The authors have no conflict of interest to declare.

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