

## Case report

# Thymoma-associated exfoliative dermatitis in a rabbit

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**Abstract** A 5-year-old rabbit with generalized scaling is presented. Multiple skin scrapings and acetate tape impressions were negative for mites and *Malassezia*. Culture for dermatophytes was also negative. Skin biopsies showed similarities with sebaceous adenitis described in rabbits (absence of sebaceous glands, perifollicular lymphocytic infiltrate at the level of the absent sebaceous glands, lymphocytic mural folliculitis, interface dermatitis). The owners refused any treatment and 2 months later the rabbit was euthanized due to anorexia. At necropsy a mass was found in the anterior mediastinum. Histopathology confirmed a diagnosis of thymoma. A possible paraneoplastic skin disease was suspected, based on similarities with thymoma-associated exfoliative dermatitis in cats.

## INTRODUCTION

Exfoliative dermatitis (ED) in rabbits can be associated with many aetiologies: malnutrition, dermatophytosis, ectoparasites, *Malassezia* dermatitis, sebaceous adenitis and epitheliotropic lymphoma.<sup>1</sup> Thymomas in rabbits are uncommon.<sup>2–6</sup> They have been associated with haemolytic anaemia, dyspnoea, swelling of the head, exophthalmos and hypercalcaemia. Successful surgical removal has been described.<sup>4</sup> The present case presented with exfoliative dermatitis and, at necropsy, a thymoma was found. Histopathology of the skin biopsies showed many similarities with five cats with thymoma-associated exfoliative dermatitis described in a recent article.<sup>7</sup> It seems that a similar disease exists in rabbits. The purpose of this article is to add another possible differential to the list of exfoliative dermatoses in rabbits.

## CASE REPORT

A 5-year-old, female rabbit weighing 1.5 kg was presented with a 6-month history of a mildly pruritic, scaling dermatosis. The rabbit was housed indoors and was fed a commercial rabbit pellet diet. The owners did not have cutaneous lesions. The only contact animal was a Maltese dog with seasonal pruritus contributed to atopic dermatitis. There was no history of anorexia or diarrhoea. No change in mental status was mentioned. Skin scrapings and dermatophyte culture performed by the referring veterinarian were negative for ectoparasites and dermatophytes. Previously, the rabbit was treated with imidacloprid (Advantage, Bayer Kiel, Germany) once and ivermectine (Ivomec, Merial,

Toulouse, France) 0.3 mg kg<sup>-1</sup> subcutaneous every 7 days for two treatments without improvement of the skin lesions. Physical examination revealed an alert rabbit. No abnormalities were detected on auscultation of the thorax and palpation of the abdomen. A generalized exfoliative dermatosis was present. The main affected areas were the face, pinnae, neck and dorsum (Figs 1, 2). Large, adherent white scales and patchy alopecia were seen. Scaling was also present, to a lesser extent, on the ventrum. The face and hocks showed some erythema. An otoscopic examination was negative for *Psoroptes cuniculi*. Multiple acetate tape impressions were negative for *Cheyletiella* or *Malassezia* infection. Deep skin scrapings failed to show any mites. Culture for dermatophytes was negative. Multiple skin biopsies were taken. No sebaceous glands were seen on histological examination. The epidermis was hyperkeratotic (Fig. 3). Some follicles showed an infiltration of lymphocytes at the level of the absent sebaceous glands (Fig. 4). Other findings included a lymphocytic mural folliculitis, cell-poor interface dermatitis and lymphocytic exocytosis. No parasites or dermatophytes were seen. A diagnosis of sebaceous adenitis was most likely, although epitheliotropic lymphoma could not be excluded. Treatment with cyclosporin or retinoids was discussed with the owners, but refused. Two months later the rabbit was represented with anorexia and no change of the skin lesions. The owners requested euthanasia. On necropsy a mass was detected in the anterior mediastinum (Fig. 5). Histopathology of this revealed a nodular, mixed proliferation of epithelial cells and small lymphocytes. There was no pseudostratified or ciliated epithelium to indicate a branchial cyst and lymphoma was excluded on the basis of small, well-differentiated lymphocytes and pronounced proliferation of epithelial cells. A diagnosis of thymoma was made. There were no other macroscopic abnormalities, so no other histopathology was performed.

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**Figure 1.** Five-year-old rabbit showing patchy alopecia and scaling on the head.



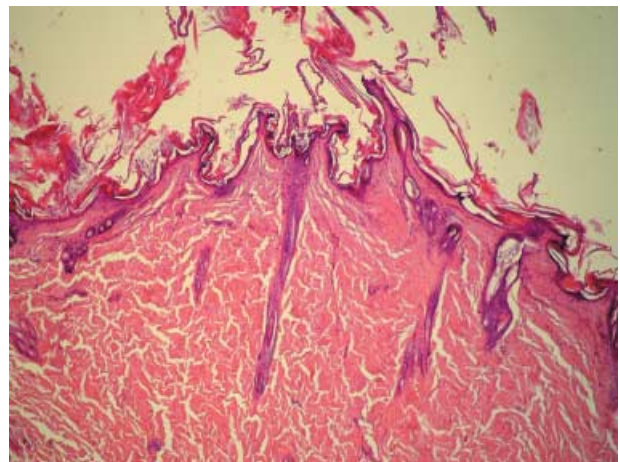
**Figure 2.** Back of the rabbit. Note alopecia and scaling.

## DISCUSSION

Exfoliative dermatitis in rabbits is associated with many aetiologies (malnutrition, dermatophytosis, ectoparasites, *Malassezia* dermatitis, sebaceous adenitis, epitheliotropic lymphoma).<sup>1</sup> Malnutrition was ruled out by history and dermatophytosis by culture. Ectoparasites and *Malassezia* were excluded through negative acetate tape impressions and skin scrapings. Epitheliotropic lymphoma, although uncommon, has been described<sup>8,9</sup> but this was excluded by necropsy and histopathology.

Clinically similar exfoliative dermatitis has been reported in another study on four domestic rabbits and diagnosed as sebaceous adenitis as no thoracic pathology was found.<sup>10</sup> However, the rabbits also had interface dermatitis so the authors mention that the sebaceous adenitis may have been part of a more generalized disorder. In the present case a thymoma was found. A causative relation with the skin lesions seems possible, although this could represent a pure coincidental finding.

This lapine case also shares many characteristics with exfoliative dermatitis in cats.<sup>7,11–18</sup> The lesions in cats consist of white scales with focal areas of alopecia, sometimes with erythema. Pruritus is usually not present. The lesions start on the head and pinnae, but become generalized. Thymomas are usually present. The histopathology is a cell-poor interface dermatitis (mild lymphocytic exocytosis, apoptosis of keratinocytes in the basal cell layer and to a lesser extent in the stratum spinosum). A recent article showed that, as

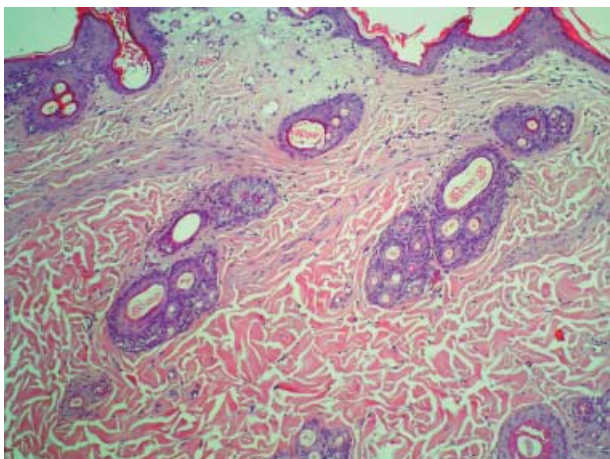


**Figure 3.** Rabbit skin. Note the hyperkeratosis, telogen follicles and absence of sebaceous glands. H&E stain,  $\times 100$ .

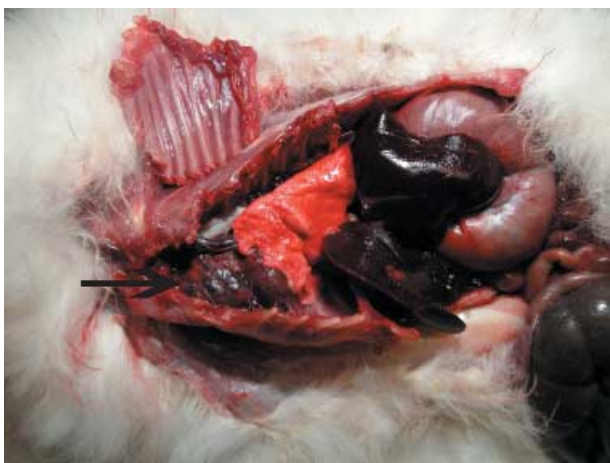
well as areas of cell-rich interface dermatitis, loss of sebaceous glands is a typical finding.<sup>7</sup> A causative relation between thymoma and exfoliative dermatitis was proven in two cats with resolution of skin lesions after surgical removal of the thymoma.<sup>7,14</sup>

Thymoma is a neoplasm of thymic epithelial cells and has been reported in many species including rabbits. An association with myasthenia gravis, polymyositis, myocarditis and some unusual dermatoses has been made in humans and approximately one in three of human thymoma patients have symptoms of autoimmune disease at the time of diagnosis.<sup>19</sup> In the





**Figure 4.** Rabbit skin. Isthmus lymphocytic mural folliculitis. H&E stain,  $\times 200$ .



**Figure 5.** Rabbit at necropsy. A large mass, histopathologically confirmed as a thymoma, is seen cranial to the heart.

rabbit, haemolytic anaemia and hypercalcaemia have been described in association with a thymoma.<sup>2-4,6</sup> In dogs and cats, an association is present between thymoma and myasthenia gravis and in cats between thymoma and exfoliative dermatitis.<sup>7,11-18</sup> It seems likely that an immune dysfunction related to the thymoma results in autoimmune disease. Probably, the altered thymic microenvironment results in abnormal intratumoral T-cell development.<sup>20</sup> In a review article of thymic pathology in dogs and cats, one cat with a thymoma and concurrent skin disease was described. Skin histopathology revealed the presence of IgG at the basement membrane zone in a pattern consistent with immune complex deposition.<sup>15</sup> Another study failed to show cross-reacting IgG antibodies in the skin but there were CD<sup>3+</sup> lymphocytes in the interface dermatitis.<sup>7</sup> A hypothesis of a T-cell mediated process caused by abnormal antigen presentation of neoplastic thymic epithelial cells was given.

To the author's knowledge, this is the first described case of exfoliative dermatitis and concurrent thymoma in a rabbit. The clinical and histopathological descriptions

are very similar to thymoma-associated exfoliative dermatitis described in the cat. A paraneoplastic process associated with a thymoma is one of the differential diagnoses in generalized scaling disorders with dorsal distribution in rabbits.

## ACKNOWLEDGEMENT

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**Résumé** Un lapin âgé de 5 ans a été présenté pour un squamosis généralisé. Des raclages cutanés multiples et des tests à la cellophane adhésive n'ont pas montré de parasite ou de *Malassezia*. Une culture fongique était négative. Des biopsies cutanées ont montré des similitudes avec l'adénite sébacée décrite chez le lapin (absence de glandes sébacées, infiltrat lymphocytaire périfolliculaire au niveau de la glande sébacée absente, folliculite murale d'interface, dermatite d'interface). Les propriétaires ont refusé tout traitement et deux mois plus tard le lapin a été euthanasié à cause d'une anorexie. L'autopsie a permis de découvrir une masse dans le médiastin antérieur. L'examen histopathologique a confirmé la présence d'un thymome. Une maladie paranéoplasique a été suspectée, en se basant sur les similitudes avec la dermatite exfoliative associée à un thymome décrite chez le chat.

**Resumen** Se presentó un conejo de 5 años con una descamación generalizada. Las improntas y raspados resultaron negativos para ácaros y *Malassezia*. Los cultivos para dermatofitos fueron también negativos. La biopsias cutáneas mostraron similitud con la adenitis sebácea descrita en conejos (ausencia de glándulas sebáceas, infiltrado perifolicular linfocítico al nivel de las glándulas ausentes, foliculitis mural linfocítica, dermatitis de la unión dermoepidérmica). Los propietarios declinaron cualquier tipo de tratamiento y dos meses después el conejo fue eutanasiado debido a anorexia. En la necropsia, se encontró una masa en el mediastino anterior. La histopatología confirmó un diagnóstico de timoma. Se sospechó de un posible síndrome paraneoplásico, basado en las similitudes con la dermatitis exfoliativa del gato, asociada a timoma.

**Zusammenfassung** Ein 5 Jahre altes Kaninchen mit generalisierter Schuppenbildung wurde vorgestellt. Mehrere Hautgeschabsel und Tesafilmpräparate waren Milben und *Malassezia* negativ. Eine Dermatophytenkultur war auch negativ. Hautproben zeigten Ähnlichkeit mit Sebadenitis, wie sie bei Kaninchen beschrieben wurde (Fehlen der Talgdrüsen, perifollikuläre lymphozytäre Infiltration im Bereich der abwesenden Talgdrüsen, lymphozytäre murale Follikulitis, Interface-Dermatitis). Die Besitzer verweigerten jegliche Behandlung und zwei Monate später wurde das Kaninchen wegen Anorexie euthanasiert. Bei der Autopsie wurde im Bereich des vorderen Mediastinums eine Masse gefunden. Histopathologisch wurde die Diagnose eines Thymoms bestätigt. Aufgrund der Autopsie und der Ähnlichkeit mit der Thymom-assoziierten exfoliativen Dermatitis bei Katzen wurde eine mögliche paraneoplastische Hauterkrankung vermutet.