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Pododermatitis, a difficult problem in rabbits...

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Foot pain (pressure sores or pododermatitis) affects adult rabbits more often than young ones, large breeds are affected more often than small breeds, and specific breeds like Rex or Angora more often than others...

The rabbit is a digitigrade animal. When moving or hopping, the body weight rests solely on the digits (toes) of the four limbs (Figure 1, 2). At rest, on the other hand, the

weight of the body is distributed all over the sole of the foot: the claws, toes, the flat bony part of the metatarsus and heel. The shift of weight-bearing pressure from the



Figure 1: Front feet that are well protected by a thick layer of fur in an 8 years old rabbit.

toes to the metatarsal and heel regions when hopping leads to the appearance of skin sores: loss of protective fur, inflammation of the skin and, ultimately, displacement of tendons. Causes are multiple. In purebred rabbits, poor hygiene (wet bedding, lack of bedding, or a metallic gridded floor without protective wooden layer) as well as genetic inheritance are the main causes. In pet rabbits, plantar trauma can, furthermore, be caused by running over hard abrasive or synthetic soils or rugs, and by obesity (Figure 3, 4). Nervous rabbits that regularly drum the soil may also develop foot sores.

Pododermatitis is a serious health problem

There are further causes for paw sores. Rex rabbits have a genetic predisposition

related to their short and soft fur. When there is insufficient litter in their litterbox, or when the Rex lives freely in an apartment, the hair under the feet wears off quickly and no longer offers the necessary protection. For the same reason, the fur under the feet should never be shaved in Angoras rabbits, at the risk of developing pododermatitis. Some rabbits may take a bad posture of the body and position their limbs incorrectly, stretching them too much forward in relation of their body. This may be due to a lack of exercise, obesity, or a painful inflammation of the joints (arthritis). This disease also affects breeding females that are fed a diet too rich in energy. Young breeding females are mainly affected, and the prevalence increases with age.

The appearance of areas without fur under the feet soles, the presence of



Figure 2: Front feet that are well protected by a thick layer of fur in an 8 years old rabbit.



Figure 3: Beginning of pododermatitis with loss of fur and keratinized skin.

inflamed and keratinized skin and changes in behavior are sufficient for diagnosis (Figure 3, 4). The rabbit may show a reduced appetite and a loss of weight. It starts limping, is reluctant to move because of pain and becomes incontinent for urine and excrement. The rabbit may even remain motionless and stay in its urine puddle. The decrease of movement and exercise will lead to a poor blood circulation in the limbs. A vicious circle gets set in motion.

Development stages of pododermatitis

The displacement of weight-bearing pressure from the toes to the metatarsal and heel regions of the foot when hopping alters the blood circulation of the affected limb, decreasing proper oxygenation of the epidermis and dermis tissues, causing their progressive destruction. Untreated pododermatitis will worsen slowly. According

to the authors, 4 to 6 stages have been differentiated. Stage 1 is characterized by the compression of hair follicles in the dermis, which leads to the loss of protective hair and the appearance of alopecic red skin. During stage 2, the skin thickens and hardens, and calluses may appear. The alopecic area expands towards the periphery. Bleeding is exceptional in these early stages. In stage 3, the bare skin becomes crusty. It is thick, rough and very hard, and has a whitish color. During stage 4, the hardened skin begins to crack, releasing a clear, viscous liquid. More or less extensive areas of the soles of the feet are wetted by this liquid. When pododermatitis reaches stage 5, the bare skin and remaining hairs of the sole of the foot are impregnated by a viscous fluid mixed with blood that flows out of the wounded skin. During stage 6, the callus is softened by the



Figure 4: Beginning of pododermatitis with loss of fur and keratinized skin.

presence of this bloody fluid and the hardened skin cracks at the surface of the sole of the foot. An ulcer may form.

Observations in rabbits

It is rare to see rabbits suffering from pododermatitis beyond stage 2. As wounds are deep, the animal suffers and may present physical and behavioral change, as mentioned earlier. Lesions up to stage 3 can be treated but need changes in the animal's husbandry, its living environment, even if healing of the wounds remains difficult. Hygiene is essential as the protective epithelial barrier preventing the infiltration of bacteria or other pathogens is broken. The presence of pus indicates that the wound is infected. Bacteria isolated from wounds include *Pasteurella multocida* and *Staphylococcus aureus*. If left without treatment, the infection may spread to the

tissue located deeper in the paw. When the bone is affected (osteomyelitis), the tendons or ligaments can be displaced over time, causing a permanent disability. This condition is easily recognizable by the special posture of the rabbit, accompanied by teeth grinding due to pain. Euthanasia may be recommended at this stage.

Possible treatment when started early

The treatment includes finding the cause of pododermatitis, in order to bring modifications to the environment (litterbox, hygiene), a reduction of the weight if obesity, the possibility to exercise, etc..., and the treatment of the wound itself. There are various approaches, including bandaging the paw and limb, even if the rabbits are notorious bandage destructors. The wound is disinfected with a diluted povidone-iodine solution and is then protected with an

antiseptic dressing. Good results have been obtained with products containing mupirocin, neomycin, zinc oxide or silver sulfadiazine. The use of medicinal Manuka honey for wound healing gives very positive results. It furthermore does not harm the digestive system of the rabbit when ingested. The use of HEALx Soother cream has also brought excellent healing in rabbits with advanced pododermatitis. The use of a phenytoin ointment can be efficient in a later stage of healing, once the wound is closed and scar tissue growing. For my part, I did have great success with the application of a Calendula and Echinacea gel accompanied by the bandaging the affected paws of my Rex rabbit. The administration of an antibiotic is sometimes necessary. Cephalosporin or azithromycin are particularly effective in the treatment of infections secondary to pododermatitis.

This condition is painful and the administration of an analgesic administration is necessary. Meloxicam (Metacam) is recommended. The latter can be used over a long time without undesirable side effects in rabbits.

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