

A Case of Chronic Superficial Keratitis in a German Shepherd Dog

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Abstract: Chronic superficial keratitis, known as Pannus and Uberreiter's syndrome, is a progressive autoimmune eye disease, especially in German shepherd dogs, Belgian shepherd dogs and greyhound breed dogs. Although the cause of the disease is not exactly known, age, racial predisposition, ultraviolet radiation, high altitude and other eye diseases trigger the formation of pannus. Ocular defects in affected animals are non-infectious and respond to treatment based on topical steroids and immunosuppressive drugs. There is no complete cure for the disease. The aim of the treatment is to significantly improve the quality of life of patients by achieving a significant reduction in symptoms. A patient with bilateral conjunctivitis in the eye and vascularization, pigmentation, epithelial perforation in the cornea in a seven-year-old male German shepherd dog was brought to our hospital for treatment. The treatment was continued regularly for five weeks and a significant decrease in corneal symptoms was observed.

Keywords: Autoimmune, Keratitis, Pannus, Pigmentatio

INTRODUCTION

Chronic superficial keratitis (CSK), also called Pannus or Uberreiter's syndrome, is a progressive chronic autoimmune eye disease in dogs that affects the epithelial and stromal layer of the cornea. The word pannus means both that the normal tissue on the cornea is replaced by granulation tissue and that the tissue located in the eye is characterized by cell infiltration and extensive vascularization (1). The etiology of this disease is unknown, and the prognosis is determined by how deep the cells of the immune system go into these layers of the cornea (2, 3). It is thought that in addition to increasing the risk of CSK with age, it may also increase with the patient's exposure to environmental factors such as exposure to smoke, ultraviolet light, high altitude (4). An eye disease caused by external factors can also cause stimulation of the autoimmune system and trigger the formation of the disease (5).

At an early stage, an increase in epithelial cells and severe plasma cell, lymphocyte, macrophage and melanocyte infiltration are observed in the stroma layer of the cornea. A condition characterized by neovascularization is

observed especially in the corneal limbus. Vascularization and cell infiltration in the corneal stroma cause the formation of fibrovascular tissue. Initially, this pink-colored tissue thickens over time as the disease progresses, melanocytes, histiocytes and fibrocytes enter the cornea, corneal edema and vascularization occur. In the developing stages, the vascularization and stromal layer in the corneal epithelium are deeper, and the region has a more pigmented appearance (1). In genetic studies where the genetic map of healthy dogs and dogs with chronic superficial keratitis is compared, it is recommended not to produce breeds that carry these genes dominantly (6). Ocular defects in affected animals are non-infectious and respond to topical steroid-based treatment. That is why CSK is considered an autoimmune disease (7). These autoimmune hypotheses are supported by reports of major histocompatibility complex in German shepherd dogs (8).

The aim of the treatment is to control the disease as much as possible to prevent the animals from going blind (3). CSK is incurable. The therapeutic goal is to control the disease and to ensure the regression of lesions in order to prevent blindness from occurring at some times (9).

CASE PRESENTATION

A seven-year-old male german shepherd dog brought to the Surgery Department of Atatürk University Veterinary Faculty Animal Hospital had conjunctivitis that had been going on for about 1 year, as well as pigmentation, vascularization, epithelial perforation in the cornea. Previously, attempts had been made to treat it with topical antibiotics and steroid applications, and the symptoms in the patient had decreased. But he was admitted to our hospital due to a recurrence of the disease. The patient underwent an eye examination after a general examination. Oculus sinister and oculus dexter had increased opacity on the central corneal surface, increased vascularization, pigmentation and fibrous tissue, and conjunctivitis chronica was found in the bulbar and palpebral conjunctiva. Fluorescein staining, Schirmer test 1 and tonometric examination were performed on the patient. Intraocular pressure (IOP) was measured using rebound tonometer(Tonovet, Icare, Vantaa, Finland) for tonometric examination. Then the Schirmer test 1 (Akschirmer, Turkey) was performed and dry eye was evaluated. Then Fluorescein staining was performed and the central corneal surface was evaluated positively in both eyes. When the breed predisposition, age, duration of the disease, previous treatments and altitude characteristics of the animal's location were evaluated, the animal was diagnosed with Uberreitter's syndrome. In the treatment, moxifloxacin was used as antibiotic drops in both eyes, two drops four times a day. Since it is an autoimmune disease, cyclosporine A was used one drop twice a day in both eyes for immunosuppressive therapy. After the perforation in the corneal epithelium healed at the end of the first week, dexamethasone was added to the treatment prescription and recommended to be used in both eyes, one drop four times a day. Fluorescein application, Schirmer test 1 and tonometric examination were performed routinely every week. After fluorescein application was applied in the first week, dye retention was observed on the central corneal region and was evaluated as positive (Figure 1, Figure 2).



Figure 1. Pigmentation, corneal edema and perforation of the corneal epithelium found in the eye in the first week.

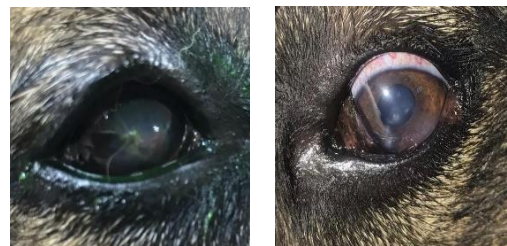


Figure 2. Involvement of the corneal surface as a result of pannus and fluorescein staining in the eye in the first week.

No steroid drops were added to the prescription for the first week. When fluorescein application was performed on the second week, there was no stain and it was evaluated as negative. Steroid use was started. The fluorescein application result was evaluated as negative in the last 3 weeks of follow-up (Figure 3, Figure 4).



Figure 3. By the end of the fifth week, pigmentation was limited in the temporal region of the cornea, and corneal edema completely disappeared. Conjunctivitis has decreased significantly.

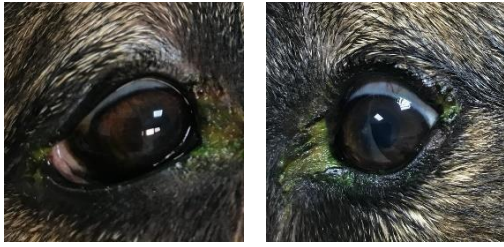


Figure 4. At the end of the fifth week, the perforation in the corneal epithelium completely disappeared and pigmentation was limited. Pigmentation has not completely disappeared.

The results of the Schirmer test 1 were measured as 20 mm, 18 mm, 17 mm, 24 mm, 25 mm for the right eye and 21 mm, 19 mm, 16 mm, 21 mm, 23 mm for the left eye respectively. During the treatment period, the amount of tears decreased for the first three weeks and increased above the first measurement for the next two weeks. The tonometric examination results were measured as 16 mm/Hg, 15 mm/Hg, 13 mm/Hg, 10 mm/Hg, 10 mm/Hg for the right eye and 17 mm/Hg, 15 mm/Hg, 14 mm/Hg, 12 mm/Hg, 11 mm/Hg for the left eye respectively. Intraocular pressure decreased during the treatment period.

DISCUSSION and CONCLUSION

It is believed that medical treatment should be tried in the treatment of CSK at the first stage (10). Corticosteroids and cyclosporins are the center of CSK treatment. Studies have shown that regular steroid use in the disease reduces corneal neovascularization, cellular infiltration and pannus. (11). Neovascularization is the most prominent symptom on the cornea among the symptoms of CSK. Therefore, the decrease in corneal neovascularization indicates that the prognosis is progressing in a good direction (12). In this case, the onset of neovascularization, which was observed especially in the first stage, decreased significantly during the five-week follow-up period. Topical cyclosporine applications prevent pigment formation but cause irritation of the conjunctival tissue (13). In this case report, it was observed that regular use of corticosteroids provided a significant amount of regression of the formed pannus. Steroid use was continued according to the condition of the

lesion. Cyclosporins are powerful immunosuppressive agents for eye diseases. Many carrier forms, especially implant forms, have been developed to strengthen the local effects and provide longer durability. Implant forms are much more effective than topical forms, but may cause complications due to their high molecular weight (14, 15). We can't use these implant form in this case. Although we have not seen any complications associated with the use of cyclosporine, it is believed that it causes the progression of pannus in the eyes of dogs in research conducted for newly emerging carrier forms (16).

IOP was high during the acute period of the disease, while it gradually decreased during the follow-up period. But in order to obtain a meaningful result, more extensive work needs to be done. In previous studies, they have noted that during acute conjunctivitis, conjunctival mucin cells are damaged, and therefore dry eyes can be observed for up to 30 days, even if conjunctivitis heals (17). In the study, while the amount of tears decreased until the third week, it was observed that it increased due to the use of medication. It was thought that the reason why the amount of tears increased after the third week was due to recovery.

Pigmentation is found not only on the surface of the cornea. it is also found on the conjunctival surfaces of the eye. (18). In this case, pigmentation was observed on the corneal surface and bulbar conjunctiva, but not on the third eyelid. CSK is an autoimmune disease and its etiology is not fully known. Many factors have been defined in its pathology, mainly breed predisposition. The commonly seen breeds are the German Shepherd dog, the Belgian shepherd dog and the Greyhound. But it is still unknown why it is so common in these breeds, and extensive research is required (19). In addition, environmental factors such as ultraviolet light are thought to cause CSK in the eye. For this purpose, lenses with UV filters have been produced to protect dogs from UV light. (20). In this case, anamnesis was taken from the animal owners that there was redness in the eyes accompanied by mucous discharge and that training was performed during intense times of the sun. With the regular use

of medications, pannus disease has significantly regressed, and the lesion has remained limited in the temporal region.

As a result, it was observed that regular use of two basic immunosuppressive agents in dogs with CSK significantly reduces pigmentation and significantly improves quality of life. While blindness does not occur in dogs that receive regular treatment, they continue to live their lives in a more comfortable way.

CONFLICT of INTEREST

The authors declare no conflict of interest.

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