

## Corneal Dermoid in dogs and Cats: A Case Series and Review of Literature

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**Abstract:** This retrospective study records all clinical and histopathological data of twelve cases of corneal dermoids in dogs and cats and reviews the literature concerning this congenital ocular defect in veterinary practice. Ten dogs and two cats were admitted to the surgery clinic with corneal outgrowths in 17 eyes over a 3 years period. The clinical data of these cases were collected and tabulated. Under general anesthesia, superficial keratectomy and conjunctivectomy were carried out to treat these animals. The operated animals were followed up for 6 months. Successful treatment was defined as complete remission of clinical signs and radical excision of the outgrowth with minimal scarring and without complications and /or recurrence. Histopathological examination of the excised outgrowths was carried out. All of the examined animals had corneal dermoids with keratoconjunctivitis and epiphora. Corneal dermoid was usually seen at direction of 2-3 o'clock in the left eye and direction of 9-10 o'clock in the right eye. It was either unilateral (N=7) or bilateral (N=5). Dogs, especially German shepherd, were more susceptible than cats. Uneventful healing was obtained after superficial keratectomy and conjunctivectomy. Histopathological examination revealed distorted corneal stroma and invasion of the corneal epithelium with melanocytes, hairs, hair follicles, sebaceous and sweat glands and adipose tissue. In conclusion, corneal dermoid is seen more frequently in the dogs – especially German shepherd - than the cats. Superficial keratectomy and conjunctivectomy are curative at 6 months post-operative follow-up.

**Key words:** Corneal Dermoid • Dogs • Cats • Superficial Keratectomy • Conjunctivectomy • Ocular Dermoid

### INTRODUCTION

Corneal dermoid is a congenital eye affection characterized by unusual presence of cutaneous tissue in the eye [1, 2].

Corneal dermoids were recorded as unilateral [3-5] or bilateral ocular defects [3, 6].

In veterinary practice, ocular dermoids were previously diagnosed in; the cornea and conjunctiva of guinea pigs [7-9], cornea, limbus and conjunctiva of cattle [6, 10-15], cornea of a rat [16], cornea of cats [17], cornea of a camel [18], limbus of a rabbit [19], cornea and limbus of dogs [3, 5, 20], cornea of birds [21] and third eyelid in a horse [22].

Chronic epiphora, keratoconjunctivitis, cutaneous outgrowths with hair clusters at various corneal locations

were the most common clinical findings in corneal dermoid in dogs and cats [3, 17].

Histopathological findings in corneal dermoid included; melanocytes, melanin granules, hairs, hair follicles, sebaceous and sweat glands and adipose tissue in the corneal epithelium and propria of affected dogs [23]. Regarding treatment of corneal dermoids, superficial keratectomy was advised [3, 5]. However, canine amniotic membrane transplantation in conjunction with a third eyelid flap after removal of large dermoids by keratectomy and conjunctivectomy was used in dogs [20].

The aims of the present study were to collect all clinical and histopathological data of corneal dermoids in both dogs and cats and to review the literature concerning this congenital ocular defect in veterinary practice.

## MATERIALS AND METHODS

Retrospective study was carried out on ten dogs and two cats with corneal dermoids. These animals were admitted to the surgery clinic at Faculty of Veterinary Medicine, Cairo University over a three years period (2010 – 2013). All clinical data including; case history, age, sex, species, breed, affected eye, affected ocular structure, clinical signs, other congenital anomalies, histopathological findings, treatment and outcome of each case were recorded.

Fluorescein stain test was performed for identification of any corneal ulceration.

The affected animals were treated by superficial keratectomy and conjunctivectomy under general injectable anesthesia. The affected animals were premedicated with subcutaneous injection of Atropine sulphate at a dose of 0.04 mg kg<sup>-1</sup> (Atropine sulphate®, ADWIA company, Egypt) and intra-muscular injection of Xylazine HCL at a dose of 1 mg kg<sup>-1</sup> (Xylaject®, ADWIA company, Egypt). The anesthesia was induced by intravenous Ketamine HCL at a dose of 5 mg kg<sup>-1</sup> in dogs and 20 mg kg<sup>-1</sup> in cats. General anesthesia was maintained in dogs with intravenous incremental doses of Thiopental sodium at a dose of 25 mg kg<sup>-1</sup>, 2.5% solution (Thiopental sodium®, EPICO, Egypt). Careful surgical excision of the corneal dermoids and a conjunctival flap were carried out using microsurgical instruments. The two eye lids were closed for a week. Local ophthalmic Tobramycin drops (Tobrin® eye drops, EIPICO, Egypt) and re-epithelializing agent (Cornergel® 5% eye gel, Bausch and Lomb Incorporated, USA) were applied for the next 14 days post operative. Intra-muscular Cefotaxime sodium at a dose of 10 mg kg<sup>-1</sup> and Diclofenac sodium at a dose of 1.1 mg kg<sup>-1</sup> were injected once/day for one day before and 5 days after surgery [24].

Multiple specimens were preserved in 10% neutral buffered formalin solution. Tissues were processed by conventional methods, sectioned at 4-6 microns and stained with hematoxyline and eosin for histopathological examination [25].

## RESULTS

All clinical data were collected in Table (1). All affected animals had the same history of chronic epiphora and ocular discharge since birth. On ophthalmic examination, the affected eye had keratoconjunctivitis and clusters of hair extending from the limbus to the center of the cornea (Figure 1). Fluorescein stain test revealed no corneal ulceration. Two dogs of 7 and 9 years old had corneal dermoids associated with no severe complications, the owners used to clip the dermoid hairs every 2 months. Surgical excision of these corneal dermoids was the advice. No other congenital defects were seen in the affected animals.

Superficial keratectomy and conjunctivectomy were successful treatments for corneal dermoids in dogs and cats and healing was uneventful in all cases. After 2 weeks, the conjunctival flap was removed and the operation site was epithelized and remained the scar. No recurrence of the corneal dermoid and disappearance of ocular discharges and epiphora were reported post surgical correction. Corneal epithelization was completed within one month after treatment. All operated eyes attained normal transparency of the cornea within 6 weeks post operative. Neovascularization, corneal scarring and impaired vision were not observed in any treated animals.

Histopathological examination revealed distorted corneal stroma and irregular arrangement of collagen fibers. Invasion of the corneal epithelium with dense

Table 1: Data of corneal dermoids in the examined dogs and cats

Case No.	Species/Breed	Sex	Age	Affected eye	Location at the cornea
1	German shepherd	female	3 months	right	Direction of 9-11 o'clock
2	German shepherd	male	2 months	bilateral	Left at 2-3 o'clock and Right at 9-10 o'clock
3	German shepherd	male	2 months	bilateral	Left at 2-4 o'clock and Right at 9-10 o'clock
4	German shepherd	female	2 months	bilateral	Left at 2-3 o'clock and Right at 9-10 o'clock
5	German shepherd	female	6 months	right	Direction of 9-10 o'clock
6	German shepherd	male	7 years	right	Direction of 9-12 o'clock
7	German shepherd	male	9 years	bilateral	Left at 2-3 o'clock and Right at 9-10 o'clock
8	Doberman pinscher	male	4 months	bilateral	Left at 2-3 o'clock and Right at 9-10 o'clock
9	Golden retriever	male	3 months	left	Left at 2-3 o'clock
10	Golden retriever	female	3 months	left	Direction of 2-4 o'clock
11	Persian cat	female	7 months	left	Direction of 3-5 o'clock
12	Persian cat	male	8 months	right	Direction of 9-10 o'clock



Fig. 1:  
 (A) Corneal dermoid at the direction of 2-4 o, clock of the left eye in a two-month-old German shepherd puppy.  
 (B) Corneal dermoid at the direction of 9-11 o, clock of the right eye in a three-month-old German shepherd puppy.  
 (C) Corneal dermoid at the direction of 2-5 o, clock of the left eye in a seven-month-old Persian cat.  
 (D) The excised corneal dermoid in figure 1A.

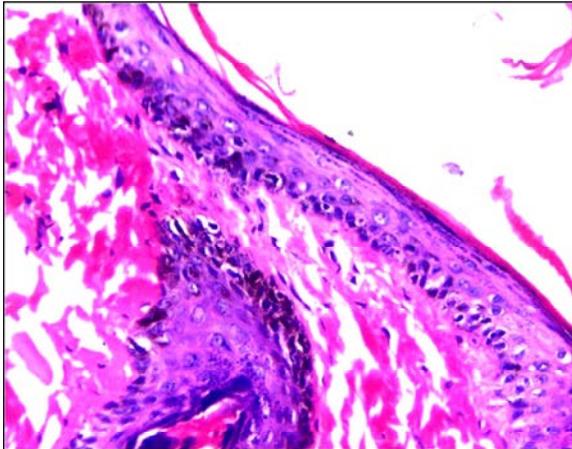


Fig. 2: Corneal dermoid in a dog showing melanin pigmentation in the basal cell layer of corneal epithelium and distorted corneal stroma (H and E X 400).

melanin pigmentation (Figure 2), hair follicles, sebaceous and sweat glands (Figure 3) and adipose tissues were also seen (Figure 4).

### DISCUSSION

General speaking, corneal dermoid is a congenital but not necessary inherited eye affection in both dogs and cats. Suspicion of heritability is often based

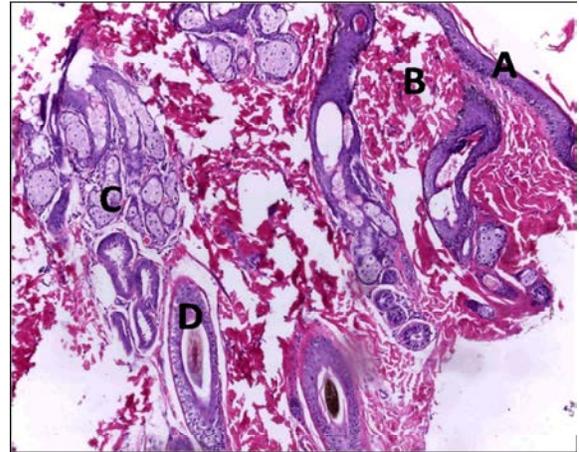


Fig. 3: Corneal dermoid in a dog showing melanin pigment in basal cell layer (A), distorted corneal stroma (B), sebaceous glands (C) and hair follicles (D) (H and E X 200)

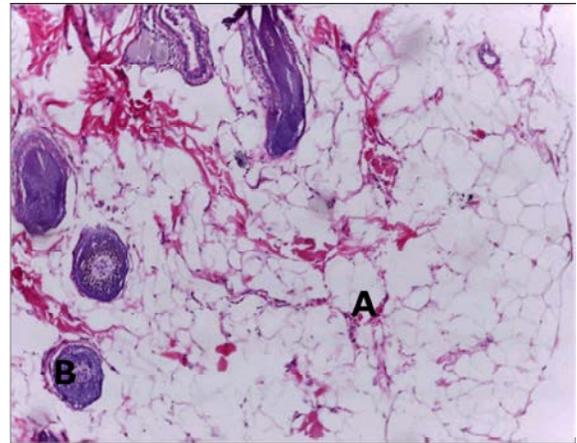


Fig. 4: Corneal dermoid in a cat showing adipose tissue (A) and cross section (B) in hair follicles (H and E X 100)

on few sporadic reports of corneal dermoid in small numbers of animals, but no genetic analysis was carried [23].

This study deals with all clinical data, histopathological findings, treatment and outcome of this ocular affection in both dogs and cats. In this study, hereditary pattern was not documented because parents of 8 cases had normal eyes while the remaining 4 cases were of unknown parents. Similar finding was mentioned before [3].

Although corneal dermoids were previously recorded in short-legged dogs such as Basset Hounds, Dachshunds and Welsh Corgis [26], Labrador retriever

[5], Chih-tzu [3] and Beagle dogs [23], German shepherd is the most commonly affected breed in this study.

Continuous epiphora and ocular discharge were the common clinical signs of corneal dermoid due to the irritation caused by the clusters of hair.

Although hair of the corneal dermoid can be removed by periodical manual epilation, it may be regrow. Similar finding was recorded [3, 23].

In the present study, corneal dermoids were recorded frequently in the dogs more than cats. This is in agreement with a previously mentioned result [27]. In the present study, the recorded cases of corneal dermoid in cats were in Persian breed. Persian was listed as the most commonly affected cat breeds with congenital ocular disorders [27].

Excision of corneal dermoid by superficial keratectomy is essential to relieve the related clinical signs. If the dermoid has not been totally excised, some degree of recurrence can be expected [4]. In addition, a conjunctival flap had been performed after superficial keratectomy to support the reepithelization, aid vascularization of the defect and consequently improve healing. More authors recommended the same flap as a concurrent treatment of corneal dermoids [3, 28].

Corneal dermoid has characteristic histopathological findings which confirm its diagnosis. The dermoid has normal skin with sebaceous and sweat glands and invades the corneal epithelium causing its distortion. Similar histopathological findings were also seen [3, 29].

In conclusion, corneal dermoid is a congenital eye defect which is seen more frequently in the dogs – especially German shepherd - than cats. Superficial keratectomy and conjunctivectomy are curative at 6 months post-operative follow-up.

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