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Incidence of corneal ulcers and opacities in dogs

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Abstract
The present study was carried out among the dogs presented to the Veterinary College Hospital, Hebbal, Bengaluru during a period of one year from January 2022 to December 2022. Radiology, Veterinary College Hospital, Hebbal, Bangalore were 13,761. Of these, 9959 were dogs. Out of these, the number of dogs presented with ocular affections were 231. The incidence of various ocular affections in dogs was found to be 2.31%, while Corneal ulcers and opacities were found to be 0.64 percent of all the cases presented, and among total ocular affections, corneal ulcers and opacities represented 27.70 percent.

Keywords: Corneal ulcer, ulcerative keratitis, occurrence

1. Introduction
Due to their facial structure, which includes shallow orbits and prominent eyes that make the eyeball more exposed, brachycephalic dogs are more prone to developing corneal ulcers than other ophthalmic diseases. Breeds like the English Bulldog, Pekingese, Pug, and Shih Tzu are among the most predisposed. Ramani *et al*., 2013) [17]. Deep corneal ulcers are a potentially vision- and globe-threatening disease. Specific surgical operations must be performed on the cornea when the depth of the corneal defect exceeds 50% of the thickness of the cornea in order to stop the disease's progression and shorten its course. (Ledbetter and Gilger. 2013) [12]. Carter (2009) [6] revealed that among the causes of eyesight loss, corneal injury ranks fourth. (After cataract, glaucoma, and age-related degeneration of the macula). Corneal diseases and trauma occupy a leading place in veterinary ophthalmology.

2. Materials and Methods
The present study was carried out in the Department of Surgery and Radiology, Veterinary College, Hebbal, Bengaluru, Karnataka.

2.1 Study period
The study was conducted for a period of 12 months from January 2022 to December 2022.

2.2 Screening
Regardless of age, gender, or breed, all the animals chosen for the study had direct ophthalmoscopic examination and vision function tests.

3. Results and Discussions
3.1 Incidence of corneal affections
The total number of animals presented to the Department during the period of study were 13,761. Out of 9959 canine patients, the number of dogs presented with ocular affections were 231. The incidence of various ocular affections in dogs was found to be 2.31%, while corneal ulcers and opacities were found to be 0.64 percent of all the cases presented, and among total ocular affections, corneal ulcers and opacities represented 27.70 percent.

3.2 Age Wise occurrence
Highest incidence of corneal ulcers was observed in the age group of 0 to 1 year 46.85 followed by age range of 1 to 3 years 25% and this in in accordance with Chinchu (2010) [7], Venugopal (2011) [19], Akinrinmade and Ogungbenro (2015) [1] and Patel *et al*. (2020) [16], reported that The most frequently injured animals by corneal ulcers and opacities were young dogs, namely those between the ages of 0 and 3 years. It was suggested that this might be because young dogs were at their most active, which made traumatic corneal injuries more common.

Moore (2003) [14] opined with a mean age of 8.2 years, middle-aged dogs had a higher frequency of corneal ulcers.

Table 1: Age-wise occurrence of the corneal ulcers and opacities

Age group	Number of dogs
0 to <1 year	30 (46.85%)
1 to < 3 year	16 (25%)
3 to < 5 years	6 (9.37%)
5 to < 10 years	9 (14.06%)
10 years and above	3 (4.68%)

3.3 Breed wise occurrence

Shih Tzus had the greatest rate of corneal ulcers of any breed (53.12%, 34/64), followed by Pugs (14.06%), Labrador Retrievers (7.8%, 5/64), Beagles (6.25%), Boxers (3.12%, 2/64), German Shepherds (3.12%, 2/64), Chow Chows (1.56%), Non-descripts (3.12%, 2/64), American Pitbulls (1.56%), This is in accordance with the findings of Hakonson and Meridith (1987) [10], Carrington *et al.* (1989) [5] and Barrett *et al.* (1991) [4] observed that The exopthalmia and ocular injury that induced logopthalmus in brachycephalic breeds was more likely to occur. The higher prevalence of brachycephalic breeds is in line with research showing that brachycephalic breeds, like shih tzus and pugs, are more susceptible to corneal affections due to a lower corneal sensitivity than mesocephalic and dolicocephalic breeds. Researchers also discovered that the globe protrusion and decreased corneal sensitivity of brachycephalic dogs negatively affect the function of the cornea's protective mechanisms. Sarangom *et al.* (2012) [18], Ramani *et al.* (2013) [17] and Antonia *et al.* (2014) [2] reported Pugs as the most affected breed. Kim *et al.* (2009) [11] documented that shih tzus were the most affected breed.

Table 2: Breed-wise occurrence of the corneal ulcers and opacities

Shih Tzu	Pug	Labrador Retriever	Beagle	Boxer	German Shepherd	American Pitbull	Chow Chow	Rottweiler	Siberian Husky	Great Dane
34	9	5	4	2	2	1	1	1	1	1

3.4 Gender wise occurrence

Occurrence of corneal ulcers in males was higher in males (56.25%, 36/64) than in females (43.75%, 28/64). The observations in this study is similar to the observations Venugopal (2011) [19], Goulle (2012) [9], Ramani *et al.* (2013) [17]. Murphy *et al.*, (2001) [15] observed that There was no sex preference observed in cases of corneal epithelial abnormalities in dogs, and any dog could develop corneal ulcers. Antonia *et al.* (2014) [2] and Akinrinmade and Ogungbenro (2015) [1] reported higher incidence of corneal ulcers and opacities in females (42.42%) as compared to males (35.49%). Murphy *et al.* (2001) [15] reported that there was no sex predilection seen in cases of corneal epithelial defects in dogs and also reported that dogs of any sex could be affected by corneal ulcer.

Table 3: Gender-wise occurrence of the corneal ulcers and opacities

Gender	Number of dogs
Male	36/64 (56.25%)
Female	28/64 (43.75%)

3.5 Occurrence based on the depth of corneal ulcer

Out of the corneal ulcers examined 71.87% (46/64) were superficial (including only the epithelium and minimal stromal tissue) and 28.12% (18/64) were deep. Similar findings were reflected by Ramani *et al.* (2013) [17], and Patel *et al.* (2020) [16] and he opined that the early presentation of the patients owing to their pets' welfare.

Table 5: Occurrence based on the depth of corneal ulcers

Depth	Number of dogs
Superficial	71.87% (46/64)
Deep	28.12 (18/64)

3.6 Occurrence based on Aetiology

Nasal trichiasis was the cause of corneal ulcer in 29 cases (45 percent), trauma was the cause in 59 cases (30 percent), entropion was the cause in six cases (10 percent), other eyelid abnormalities were the cause in four cases (6 percent), dermoid cyst was the cause in four cases (6 percent), and third eyelid tumour was the cause in two cases (3 percent). This was in agreement with Patel *et al.* (2020) [16], who found that the brachycephalic skull conformation feature nasal fold trichiasis increased the risk of corneal ulcers in brachycephalic people. According to Vidhyashree (2022) [20], bacterial keratitis is the main cause of corneal ulcers. However, Voitekha and Shilkin (2022) [21] and Mandell and Holt (2005) [13] reported that Kerato-conjunctivitis sicca and trauma were the main predisposing causes in contrast to these findings.

Table 6: Occurrence based on the depth of corneal ulcers

Etiology	Number of dogs
Trichiasis	45%
Trauma	30%
Entropion	10%
Eyelid Abnormalities	6%
Dermoid Cyst	6%
Third Eyelid Masses	3%

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