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**Scientific Report**

# Secondary glaucoma due to anterior chamber lipoma and uveitis in a Pekingese dog

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## Summary

The present study introduces a rare case with secondary glaucoma due to anterior chamber lipoma and uveitis in a Pekingese dog in Iran. A four-year-old castrated male Pekingese dog was referred to the private clinic with impaired vision of the left eye, pain, rubbing the left eye onto carpet, presence of a milky-coloured mass into the anterior chamber, and loss of appetite. The clinical examination, haematological and biochemical tests, fluorescein staining, measurement of intraocular pressure and ultrasonography were conducted. Based on all results, medical and surgical treatments were carried out. The mass was removed surgically and its histopathologic study revealed lipoma. The eye appearance became normal within 6 weeks. Authors concluded that the milky-coloured mass in the anterior chamber may have caused secondary glaucoma due to obstruction of the aqueous outflow from iridocorneal angle and uveitis.

**Key words:** Secondary glaucoma, Uveitis, Lipoma, Dog, Iran

## Introduction

The glaucomas are a complex of pathologic conditions with clinical manifestations that vary with the elevation in intraocular pressure and its consequences (Slatter, 2001; Slatter and Dietrich, 2003). Secondary glaucoma is an increase in intraocular pressure due to preexisting or concomitant disease (Peterson and Crispin, 2002). Frequently, a given case of glaucoma has several contributing factors, making simple classification into any category difficult. Because of the wide variety causes of glaucoma, accurate evaluation of medical and surgical treatment depends on correct diagnosis and classification (Slatter, 2001). Uveitis is an inflammatory disease of uvea that is one of the most common ocular diseases and one of the most common causes of blindness in dogs (Slatter, 2001; Peterson and Crispin, 2002). With inflammation, peripheral anterior synechiae form, causing narrowing of the angle with each subsequent attack (Miller, 2003; Slatter and Dietrich, 2003). Predisposed breeds to glaucoma are Australian shepherd, Basset hound, Beagle, Chihuahua, German shepherd, Greyhound, Miniature poodle, Miniature schnauzer, Norwegian elkhound, Spaniel breeds, Pembroke Welsh corgi, Welsh terrier, Toy poodle, and Toy terrier (Gellat and Mackay, 2001; Slatter, 2001). The purpose of the present clinical report is to introduce a rare eye problem in a Pekingese dog in Iran.

## Materials and Methods

A four-year-old castrated male Pekingese dog, weighed 8 kg was referred to the private clinic with impaired vision of the left eye and pain with unknown etiology.

Owner claimed an aggressive behaviour of the dog that gradually replaced by timidity. The dog also suffered from rubbing the left eye onto carpet, impaired vision, and anorexia. The clinical examination revealed pain, descemetocele, presence of a milky substance in the anterior chamber, severe engorged episcleral vessels, Descemet's streaks (Haab's striae), loss of vision and corneal oedema of the left eye (Fig. 1). Intraocular pressure of the left eye was measured 42 mm Hg which was 26 mm Hg in the right eye, using Schiotz tonometer. The blood sample was taken from cephalic vein and haematological and biochemical profiles were assessed. Fluorescein staining of cornea showed a descemetocele on the centre of the affected eye. Thoracic radiography which was taken laterally and ventrodorsally showed no abnormalities. Anterior chamber, lens, and globe diameters were studied by ultrasonography as well as lens position. In haematological and biochemical studies all profiles were in the normal range with the exception of mild neutrophilia. There was no pathological change in the thoracic cavity. Ultrasonographic findings showed no lens dislocation but detected an echogenic area in the left anterior chamber. Diameter of the left and right anterior chambers (distance between iris and cornea), left and right lens, left and right globes were 0.279 and 0.314 cm ($D_1$), 0.724 and 0.724 cm ($D_2$), 1.870 and 1.980 cm, respectively. The ratio of $D_1$ to $D_2$ was 39 and 43% in the left and right eyes, respectively (Fig. 2). All findings confirmed glaucoma with uveitis of the left eye. Based on clinical and paraclinical findings, medical treatment was considered. Firstly intraocular pressure was reduced with acetazolamide (5 mg/kg tid, orally) and pilocarpine 2% (topical drop), routinely. Then, topical betamethasone (0.1% qid) and systemic prednisolone (1 mg/kg, taper dose, orally), and aspirin (15 mg/kg tid, orally) were used to treat uveitis carefully. To prevent the gastric ulcer, the patient took cimetidine (5 mg/kg tid, orally). After 7 days of medical therapy, intraocular pressure and uveitis disappeared with no change in size of the milky substance. As medical treatment was not useful to solve the echogenic article of the anterior chamber, therefore surgical treatment was suggested for removing the milky substance. Dog received dextrose-saline solution (20 mg/kg/h) preoperatively with atropine (0.03 mg/kg, SC) half an hour before anaesthesia. Cefazolin (22 mg/kg, IV) was administrated as a prophylactic antibiotic before operation. Propofol (7.5 mg/kg, IV) was administrated as an induction and maintenance of anaesthesia. For preoperative mydriasis, atropine (1%, tid) was used on the day of surgery. The patient was positioned in right lateral recumbency. Cilia on the upper eyelid were trimmed. Preocular area was cleaned with gauze sponges in sterile saline. Povidine-iodine solution (1.25%) was used to disinfect the conjunctival sac and then operative site was carefully cleaned with ethyl alcohol. The surgical field was draped with three field drapes. Using a lid speculum, a limbal incision was made by spatula knife of 45 degree. The incision was extended with corneal scissors. Once, aqueous went out and immediately anterior chamber was filled with methylcellulose solution to protect the cornea. The milky substance was removed by Adson tissue forceps. Cornea was sutured with simple interrupted sutures placed about 1 mm apart using 7-0 polyglactin 910. Before completing of closure, the anterior chamber was reconstructed with an air bubble. The removed mass was sent for histopathologic examination. The patient was given topical and systemic antibiotics, chloramphenicol and cephalexin for 28 and 3 days, respectively. Moreover, long-term management of glaucoma was performed with oral carbonic anhydrase inhibitor (acetazolamide, 5 mg/kg tid, orally), sympathomimetic agent (epinephrine 1% tid, topical drop) and beta-adrenergic antagonist (timolol 0.5% bid, topical drop).

The left eye appearance became normal and all symptoms disappeared during 6 weeks. Histopathological diagnosis of the sample confirmed lipoma (Fig. 3). Intraocular pressure reduced from 42 mm Hg to 17. There was no recurrence of lipoma in patient.

## Discussion

Glaucoma is a frequent complication of

**Fig. 1: Left eye. Corneal ulcer (descemetocele), engorged episcleral vessels, Descemet's streaks, and floating milky substance in the anterior chamber are seen**

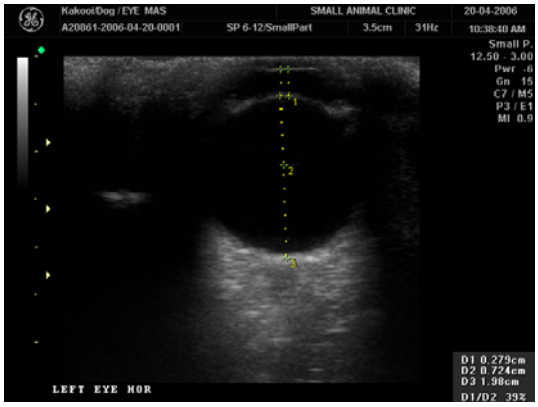


**Fig. 2: Ultrasonogram of the left eye. Showing diameter of the anterior chamber ($D_1$), diameter of lens ($D_2$) and diameter of globe ($D_3$). An echogenic area in the anterior chamber is seen**

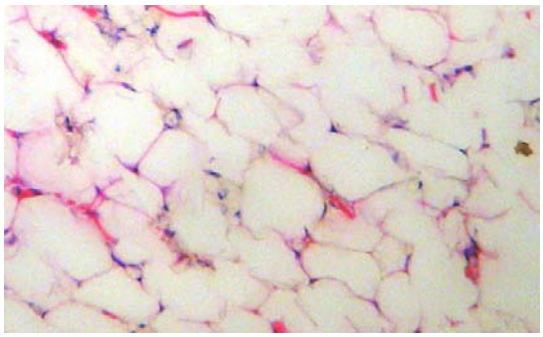

**Fig. 3: Histopathology of mass removed from left eye shows lipoma fat cells (H&E, ×400)**

uveitis, resulting from blockage of the drainage angle by inflammatory cells, swollen iris tissues, or lenticular debris, and formation of the iris bombé (adhesions to the lens surface) (Slatter, 2001). The response to the medical treatments confirmed the accurate diagnosis of uveitis and secondary glaucoma (Slatter, 2001; Massa *et al*., 2002; Sigle *et al*., 2006). In the present clinical report, ultrasonography was helpful to find buphthalmos and to measure depth of the anterior chamber of eye as well as lens measurement. Although ultrasonography has been used to examine the contents of opaque eyes and gives immediate results with excellent definition, but it could not differentiate between neoplasia and inflammation (Slatter, 2001). It is clear that shallow anterior chamber caused narrowness of iridocorneal angle and increasing of intraocular pressure (Slatter, 2001). In the present study, we do not find any sign of iris bombé (posterior chamber blockage). The presence of a floating substance in the anterior chamber could compromise the outflow of aqueous and producing secondary glaucoma with narrowness of iridocorneal angle owing to shallow anterior chamber. Secondary glaucoma aggravates the anterior chamber and whole globe conditions. Of course decreased depth of the anterior chamber is also a useful and worthy finding of ultrasonography that justified partial blockage of iridocorneal angle and subsequent glaucoma. We could not find any relationship between uveitis and presence of lipoma in the anterior chamber. Some investigators have stated that uveitis could break down the blood-aqueous barrier so lipoproteins cross it and causing a cloudy appearance with underlying hyperlipo-proteinaemia, particularly in the Miniature schnauzer (Slatter, 2001; Peterson and Crispin, 2002). Laboratory findings of the present study showed that the lipid level was in normal range in dog. The previous studies showed that persistent increasing of intraocular pressure cause buphthalmos following stretching of the sclera and cornea in younger animals that depends on breed and individual characteristics (Slatter, 2001). The present case report showed that Pekingese breed is a susceptible breed that reacted to the high pressure of the anterior chamber with enlarging of the globe (left eye). We also met Haab's striae on the cornea because of the linear ruptures in Descemet's membrane that has been seen in the previous studies (Slatter, 2001). We found that floating substances in the anterior

chamber could probably cause partial blockage of the anterior chamber outflow. After falling of outflow rate, intraocular pressure increases and glaucoma occurs.

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