Proceeding of the SEVC
Southern European Veterinary Conference

Oct. 17-19, 2008 – Barcelona, Spain

http://www.sevc.info

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1. Introduction
In most animals, when the eye is open, the lids encircle the cornea, thus covering almost all the sclera. The average length of the palpebral fissure when stretched is approximately 28 mm in cats and 33 mm in dogs. The circular muscle surrounding the palpebral fissure is the orbicularis oculi muscle. In domestic animals, eyelid closure may be very firm, particularly when the animal is in pain (blepharospasm). Blepharospasm often occurs as a result of ocular pain, causing spasm of the orbicularis and enophthalmos, resulting in reduced support for the margin of the eyelid allowing the lid to turn in towards the globe (secondary entropion), and producing further pain and contraction of the orbicularis oculi, i.e. blepharospasm and associated enophthalmos. The levator muscles (innervated by the oculomotor nerve) open the upper eyelid and the malaris muscle opens the lower eyelid.

The free margins of the eyelids are usually pigmented (but often non-pigmented if the skin around the eye is non-pigmented, e.g. in the area of a white spot around the eye), and they are hairless. In dogs and cats, the borderline of the eyelash-like hairs and the regular hairs in the upper lid begin about 1 mm away from the free lid margin (and not at the edge itself, as in humans). The meibomian glands are visible on the conjunctival surface, below the conjunctiva, as 2–4-mm long, whitish-yellow lines running perpendicular to the margin. Meibomian glands are not present in birds. The oily material secreted by these glands coats the margin of the lid with a lipid layer, preventing the tear fluid from flowing across it and the secretion also forms an extremely thin oily film reducing evaporation, providing lubrication and preventing adhesion of debris.

2. Ankyloblepharon
Ankyloblepharon is delayed or complete failure of opening of the palpebral fissure. The bridge of tissue in the palpebral fissure between the already developed margins of the eyelid normally atrophies 10–14 days post-partum (dog, cat). Even though little is known about the cause of this regressive defect, some epidermal growth factor must be involved.
Treatment consists of massaging or mechanical spreading with mosquito forceps in the spontaneous first opening, or into the groove of the future fissure starting in the medial canthus.

3. Aplasia palpebrae
In aplasia palpebrae or lid coloboma the margins of the eyelids are completely or party undeveloped. This anomaly is congenital, most likely hereditary (recessive), and usually bilateral, affecting the lateral part of the upper eyelid. It occurs in many cat breeds including the wild cat, but it occurs more frequently in Persian cats or their crossbreeds, but is rare in dog. Aplasia palpebrae is often associated with other congenital anomalies such as microphthalmia, absence of the lacrimal gland, KCS, or cataract.
If there are ectopic hairs in the area, these have to be removed (see Distichiasis). If the cornea is only slightly irritated, administration of topical fatty lubricants, to effect, on a daily basis will be sufficient. If the lesions are larger, a substitute eyelid should be created by blepharoplasty (usually arch- or pedicle-shaped). The patient should be referred to a specialist with experience in these techniques.

4. Dermoids/dysplasia of the lid
Dermoids and dysplasia of the lids are ectopic and abnormally developed islands of skin in or on the margin of the eyelid. They are rare, possibly hereditary, anomalies, usually of the lower lid near the
lateral canthus. An island or fold of skin often disrupts the lid margin and is continuous with the conjunctiva. Blinking is abnormal and hairs generally grow towards the cornea causing chronic irritation, and resulting in edema, vascularization, and pigmentation. Treatment consists of removal of the abnormal parts of the eyelid, after which the lid margin wound is closed with extreme care. Blepharoplasties are seldom necessary, because the fissure length is sufficient in most cases. For patients with severe defects it may be best to refer them to a specialist.

5. Distichiasis

Distichia are single or multiple hairs arising from the free lid margin. They usually arise from the meibomian duct openings and their hair follicles are located in the lid margin, in or near to the base of the meibomian glands. Stiff hairs that rub the cornea can irritate and injure it. Irritation leads to increased lacrimation and slight blepharospasm, and thus epiphora. These abnormal hairs may act as a wick resulting in an overflow of tears over the lower lid margin, moistening the margin and the exterior skin of the eyelid. Although distichiasis is considered to be inherited, the mode of transmission is unknown.

The simplest treatment is manual epilation. More permanent treatment by electro-epilation requires general anesthesia and adequate magnification (x5–10) to detect the orifice of the hair follicle. The hair follicle is destroyed by means of a very thin steel wire (e.g. Perma Tweez®), which is introduced into the root of the hair follicle. Excessive coagulation must be avoided, as it will cause formation of irritating scar tissue on the free lid margin. Other methods of treatment which have been advocated include the use of an electro scalpel, high frequency radio-hyperthermia or cryosurgery on the conjunctival surface adjacent to the follicle. Cryodestruction is less selective, and has the disadvantage of considerable postoperative swelling and long-term depigmentation. Affected animals should not be used for breeding.

6. Entropion

Entropion is the inversion of all or parts of the margin of an eyelid. The degree of entropion is considered to be mild when the margin is tilted by about 45 degrees, moderate when it is tilted by about 90 degrees, and severe when the margin is turned inwards by about 180 degrees. Entropion may be medial, angular, or total, and may affect the lower and/or upper lid.

The inverted position of the lid against the cornea results in corneal irritation, extra lacrimation, and blepharospasm. The margin and exterior surface of the eyelid are moist and there may be mucopurulent discharge depending on the severity of the inversion and degree of corneal irritation. Where hairs rub the cornea, corneal defects or sequestration is common. Because of the pain there is an enophthalmos, resulting in loss of support of the lid margin and subsequently, an increase of the entropion. This leads to a vicious circle that can only be broken by surgical correction of the entropion. The lesions may heal by granulation tissue or they may deepen until perforation occurs. The final stage is the formation of scar tissue and pigmentation or, sometimes, loss of the eye.

In mild entropion, the cornea may be protected by a topical lubricant. It is usually best to postpone surgical correction until the head has grown to full size (1–2 years of age). In puppies less than 8–12 weeks old (mainly Shar Pei's) with severe entropion, a few sutures ("tacking"; some clinicians use unnecessary irritating staples) can be placed to gather up the skin of the lid and thereby evert the lid, thus preventing corneal lesions. In some cases, the entropion will not require further correction. Tacking causes scar formation, also after removal of the stitches, resulting in correction of the entropion and must thus be considered an operative entropion intervention. Severe entropion should always be corrected, even in very young animals (with corneal ulceration: within one day). Special care must be taken to avoid overcorrection particularly in young animals. Many methods and variations are available for the correction of entropion, mostly based on the Celsus-Hotz procedure (Celsus, 1st century A.D.). Overcorrection will cause ectropion, which will itself be difficult to correct. Accordingly, estimating correctly the amount of tissue to be removed is important.

The wound is closed with interrupted sutures of suture material that will effectively re-appose the
wound edges and should never exceed 5-0. The sutures are placed at intervals of not more than 2 mm. Continuous sutures are only used over 3-5 interrupted sutures. Affected animals should not be used for breeding.

7. Ectropion and/or oversized palpebral fissure (macroblepharon) (Ect/OPF)
Ectropion is eversion of the margin of the lower eyelid. It is readily recognized because the orifices of the meibomian glands are visible in the everted margin, the palpebral fissure is often too long, and the lower lid is not adjacent to the globe. The conjunctival sac then becomes chronically inflamed as a result of its permanent exposure to air, dust, bacteria, etc. In more severe cases (e.g. Bloodhound, St. Bernard, Clumber spaniel, Leonberger, and other dogs), there is often some inversion near both ends when the middle portion of the lid is everted, which will result in a chronic purulent conjunctivitis. Most forms of Ect/OPF are congenital and breed-related or hereditary. The genetic transmission is most likely polygenic.

If the defect is slight, no treatment is required apart from irrigating the eyes upon returning from walks and applying a lubricating ophthalmic ointment or solution, particularly in young dogs whose heads have not yet reached adult size. In more severe lesions, corrective measures may be taken. Because these procedures require a high degree of judgment and experience on the part of the surgeon (unwanted scars may be an “eyesore” to the owner), such patients are usually referred.

8. Trichiasis
Trichiasis is the presence of normally located but abnormally directed hairs that irritate the globe and/or conjunctiva. The chronic corneal irritation results in extra lacrimation, blepharospasm, and mucopurulent discharge. Where hairs rub the cornea, corneal defects are common. The lesions are often healed by granulation tissue, but they may also deepen until perforation occurs. The final stage is the formation of scar tissue and pigmentation, or sometimes even the loss of the eye. Trichiasis must usually be corrected surgically. Because the methods available require a high degree of judgment and experience on the part of the surgeon, such patients are usually referred at short notice (in case of corneal defects, within one day).

Trichiasis may occur in 1) nasal folds and 2) the upper eyelid, usually dorsolaterally and in combination with entropion in the same area, or 3) in the caruncle or other more rare locations. Aplasia of the lid may also predispose to misdirected hairs irritating the globe. Also, badly healed lid lacerations or blepharoplasties may result in trichiasis. Trichiasis occurs in several dog breeds as a hereditary, most likely polygenic, entity and is a desired characteristic in some breed standards.

8.1. Nasal fold trichiasis
In this operation, the medial canthus skin over about 2 cm, the canthus itself, the first 6-8 mm of the lid edges (without traumatizing the puncta!) and the hairy caruncle in the medial canthal conjunctiva are removed. Care should be taken not to injure the lacrimal puncta and canaliculi. The conjunctiva, the margins of the lid, and the skin are closed with a continuous suture, using 6-0 absorbable material. Postoperative treatment consists of topical "initial choice" antibiotic ointment, 4 times daily for 14 days.

As a result of this operation, the medial canthus is turned outwards, emerges from behind the nasal folds, and is displaced 6–10 mm laterally. Another benefit is the shortening of the palpebral fissure by 6–8 mm, which practically precludes luxation of the globe and diminishes the lagophthalmic complications.

8.2. Upper eyelid trichiasis
Major “facelifts” can be performed in severe cases, as described by Kása and Kása, although the entropion of the upper lid margin itself still has to be corrected. Also a brow-sling, as has been developed by Willis et al, can be successful, although complications such as recurrences, infections around the implanted sling, and uncontrolled scarring may occur. For these reasons, such methods require the hands of a specialist.
Radical excision of the upper lid skin, including the irritating, eyelash-like hairs, and the forced
secondary granulation (Stades’ method) can be used in severe cases.

8.3. Caruncle trichiasis and trichiasis in other locations
The caruncle normally contains soft hairs, which are directed outwards. In brachycephalic breeds (Pekingese, Shih Tzu), these hairs may irritate the globe. They may grow very long, up to 10-15 mm. Also in other lid skin locations around the eye, misdirected hairs can be found irritating the conjunctiva and/or cornea.
The hairs can be epilated first to be sure they are the cause of the irritation. The medial canthoplasty, Stades forced granulation procedure, electro- or cryo destruction may be indicated. Because of the required experience on the part of the surgeon, such patients are best referred.

9. Blepharophimosis
Blepharophimosis, or an abnormally small palpebral fissure, usually occurs with entropion of the upper eyelid. It is a rare congenital anomaly in the Schipperke and Miniature Pinscher. The palpebral fissure appears to be displaced upwards by a few millimeters.
Therapy: Treatment consists of enlarging the palpebral fissure by canthotomy or, preferably, by lateral canthoplasty.

10. Oversized/overlong palpebral fissure
(See 7 Ectropion)

11. Injuries
Eyelids and conjunctival sac wounds are often right-angled and bleed heavily. If the lid edge has been cut through, the defect will enlarge spontaneously in the lid via contraction of the orbicularis oculi muscle. Wounds in the eyelid should therefore always be sutured directly, even if they are more than 8 hours old. Mechanical wound debridement should be kept to a minimum. A water-pick is an excellent method of providing irrigation and wound debridement.

The wound in the edge of the lid must be closed very precisely with a figure of eight or mattress suture (5-0 or 6-0 monofilament nylon, [cutting] round body needle; absorbable only for aggressive or difficult to handle, high anesthesia patients. The remaining parts of the wound are then closed by sutures at half the distance, thus preventing unequal traction upon the wound edges. The maximal distance between sutures should not be more than 2 mm.

Lacerations of the medial canthus are rare. They are usually in the lower lid and accompanied by laceration of the lacrimal ducts. The canaliculi are to be located and tubing inserted before closure of the wound, for which these cases are generally referred.

When there is loss of tissue at the margin of the lid, retraction will enlarge the defect even more. A blepharoplasty should be performed immediately, for which these cases are generally referred.

12. Ptosis
Ptosis is drooping of the upper eyelid caused by a functional (neural or muscular) disorder of the levator palpebrae (oculomotorius nerve) and levator anguli oculi medialis muscles of the upper lid. The causes include Horner's syndrome, trauma, paralysis, and other neurologic and hormonal disorders. Treatment must be directed at the primary cause.

13. Lagophthalmos
Lagophthalmos is an inability to close the eyelids. It may be a consequence of disorders of the facial nerve that lead to paralysis of the orbicularis oculi muscle or be congenital in the prominent-eyed breeds. If lagophthalmos persists it predisposes to exposure corneal desiccation, resulting in vascularization, granulation, pigmentation, and in cats sequestration.

14. Blepharitis
Blepharitis is an inflammation of the eyelids. When the glands of the margins of the eyelid are also affected, the condition is described as blepharitis adenomatosa, tarsitis, or meibomianitis. Among the causes of blepharitis are direct or indirect hypersensitivity reactions, immune-mediated disease, food allergies, trauma, and infections. Blepharitis can be divided in non-specific, chronic, specific (chalazion/hordeolum/ B. adenomatosa (meibomianitis), juxtapalpebral defects/granulomatous changes, eosinophilic granuloma and blepharitis in birds.

15. Neoplasia of the eyelids
Neoplasms of the eyelids are quite common in dogs, horses, and cattle, but are rare in cats. In dogs, more than 85% are adenomas. Pathologists not experienced in this field can easily misinterpret these as malignant because of the glandular tissue. Small, cauliflower-shaped protrusions on the margin of the eyelid, arising from the meibomian, Zeis or Moll glands, are usually benign adenomas. Papillomas may have a similar appearance, but they tend to hang from the epithelial surface of the outer lid margin. They may irritate the cornea when the eyelid blinks; sometimes they may bleed a little when they are rubbed.

In cats, cattle and horses, neoplasms are usually malignant squamous cell or basal cell carcinomas and sarcomas. Carcinomas are seen more often in white cats (possibly in connection with UV hypersensitivity). Diagnosis is established by means of biopsy or, in the case of small neoplasms, by direct radical excision.
Smaller, stalked neoplasia on the margin of the eyelid should never be ligated or pinched out. In neoplasia involving only one or more glands, radical excision is necessary. If more than approximately 10% of the lid length is involved (in normal lid fissure length eye), this is followed by a blepharoplasty. Cryosurgery is also possible, but may cause long-term depigmentation and leave a lid margin defect. These methods usually require more extensive blepharoplasties, so it may be best to refer these patients.