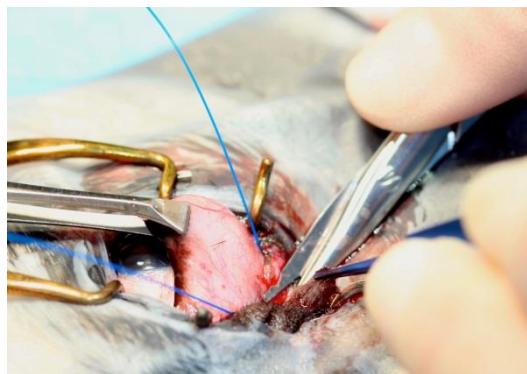


Ocular Surgery for Advanced Practitioners Mini Series

Session One: Surgery of the eyelids

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Session 1 – Surgery of the eyelids

Eyelids protect the globe and the conjunctiva, Meibomian glands and goblet cells contribute to the precorneal tear film and the blink distributes the tears across the cornea and supports the drainage through the lacrimal puncta into the nasolacrimal duct.

Healthy eyelids are essential for a good ocular surface health. A number of eyelid conditions prevent the eyelids from fulfilling these functions leading to ocular surface disease including corneal desiccation, pigmentation, vascularisation or even ulceration. Especially the latter may be very painful for the patient. Conditions such as ectopic cilia, neoplasia, lacerations, macroblepharon, ectropion and entropion may need to be corrected surgically.

For eyelid surgery the following equipment should be available

- Operating loops (2,5 – 4x magnification)
- Vacuum cushion for adequate positioning
- Illumination
- Surgical instruments of adequate size
 - Scalpel (No 15 or micro scalpel)
 - Needle holder (without lock, smooth jaw, flat handle)
 - Small scissors (blunt tips)
 - Jager lid plate
 - Fine rat tooth forceps (0.3- 0.5 mm) with tying platform
 - (Chalazion clamp)
- Needles
 - Atraumatic
 - 3/8 - ½
 - Round, spatula shaped or cutting
 - 6/0 - 5/0
 - Mono- or polyfilament
 - Resorbable or non resorbable

Before surgery the hair is removed and the surgical field (skin and ocular surface including the conjunctiva) is aseptically prepared. The skin can be treated with 1:10 iodine solution and the ocular surface with 1:50 iodine solution. Care has to be taken not to damage the

fragile periocular skin. Adhesive drape tape should be used to fix the surgical drape as towel clamps may distort the tissue.

The eyelids are rather fragile so that the tissue should be minimally handled. Care should be taken when closing or reconstructing the lid margin to prevent future irritation.

Eyelid surgery can be practiced easily on cadavers. However, when dealing with patients gaining experience by assisting or being supervised by an experienced surgeon is strongly advised for the more complicated techniques.

Ectopic cilia

These extra lashes extend through the conjunctiva towards the ocular surface and cause significant ocular pain and often corneal ulcers.

Surgical removal should be curative. The eyelid is stabilised with a Chalazion clamp which will also provide haemostasis. An No 11 scalpel blade or a small (2 or 3mm) biopsy punch may be used to outline the tissue to be excised. The root of the hair should be completely removed. Care should be taken not to penetrate the eyelid.

Eyelid tumours

Neoplastic lesions in the dog are common and mostly benign. By far the most common tumours originate from the Meibomian glands. They may obstruct the glands' openings and cause an accumulation of Meibom with a secondary inflammation of the surrounding tissue.

Eyelid tumours in cats are far less common but more likely to be aggressive, with squamous cell carcinomas being most common. Other common tumours include haemangiomas and adenocarcinomas.

Tumours extending to up to 1/3 of the eyelid length may be excised and the wound margins sutured directly. Larger tumours may require more complicated grafting procedures.

Manipulation of the tumour during surgery should be avoided, particularly if a malignant lesion is expected.

Most eyelid tumours are removed via a house-shaped wedge resection. The incisions of the eyelid are done at 90 degrees to the lid margin for about 2-3 mm, then the tissue is removed in a wedge-shaped fashion. Wound closure can be performed in a single or a two-layered

fashion. For the single layered closure the suture should go through skin and muscle. For the two-layered approach sutures are placed at the level of the tarsus (fibrous tissue deep in the eyelid, close to the conjunctiva) and at the level of skin and muscle.

The eyelid margin is best restored using a so-called figure of eight suture (Figure 1), to allow an adequate reconstruction of a smooth eyelid margin without a step. The deep suture of the tarsus is mostly done using simple or mattress single interrupted sutures. The skin is closed with simple single interrupted sutures.

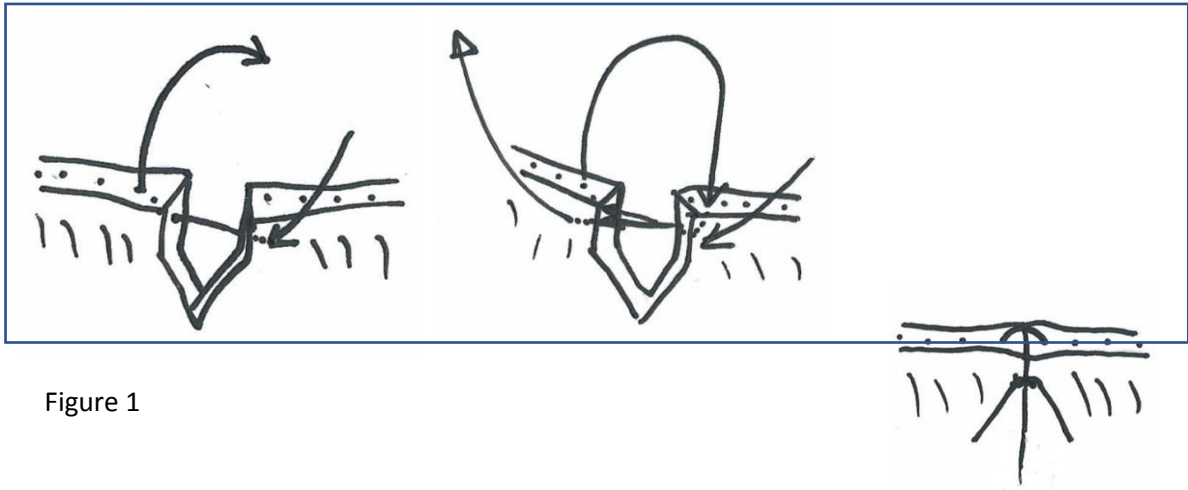
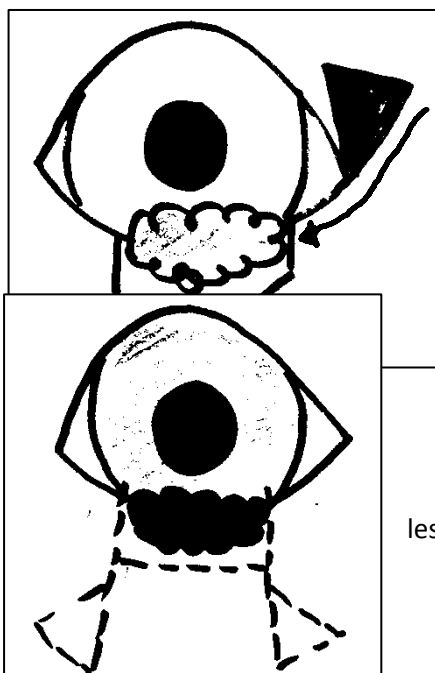


Figure 1

In case of large lid tumours more complex lid plasties may be required including a “triangle - triangle” blepharoplasty, H – plasty or lip – to lid plasty.

By performing a “triangle to triangle” blepharoplasty skin at the lateral canthus is mobilized to replace the removed lid margin (Figure 2). Since the newly created lid margin bears hair

which may cause irritation this should be kept to the necessary minimum to reduce the risk of irritation or the need of an additional surgery.



An H – plasty allows mobilization of the skin beyond the lesion that is extended towards the lid margin (Figure 3).

Figure 3

Hair bearing skin is here also used to create a new eyelid margin. Should hair be rubbing after the healing process has been completed additional treatment may be necessary (e. G. Stades technique).

The mucocutaneous junction of the mouth is used to create a new lid margin with the lip – to – lid technique. This complex technique is suitable to replace the lid margin after the removal of larger neoplasms but also in case of an agenesis of the eyelid as often seen in cats or following a loss of tissue due to a trauma. This technique can be used for the upper and lower eyelid margin as well as the lateral canthus. Keeping the graft wide and minimizing handling is essential to maintain vascularization and a vital graft.

Depending on the type of neoplasm adjunctive therapy may be advisable to reduce the risk of recurrence. This is for example required for squamous cell carcinomas in the cat.

Examples of adjunctive therapy include radiation (ionizing or beta radiation), cryotherapy and chemotherapy.

Lacerations of the eyelid

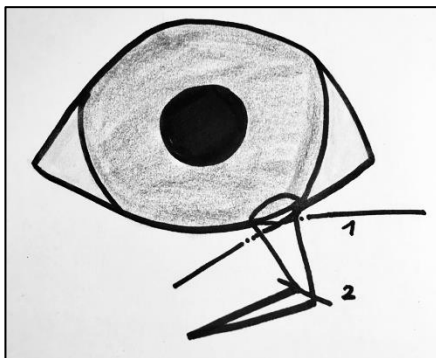


Figure 4

Eyelid lacerations should be addressed straight away if possible as the tissue contracts quickly, making a reconstruction more difficult. In case of small lesions direct closure can be performed. Larger lesions require more complex reconstructions. Eyelid tissue should be minimally debrided to reduce tissue loss. The eyelid margin should be reconstructed using the figure of eight suture followed by direct suturing of prominent points (corners). The

remaining wound margins are adapted by halving the wound margins. Single interrupted sutures should be used.

Macroblepharon

Macroblepharon describes an abnormally large palpebral fissure. There are two forms of presentation, one in brachycephalic dogs and one in giant breeds.

The former results in increased exposure of the ocular surface (recognisable by excessive scleral show) with often exposed, sometimes protruding eyes with secondary exposure related ocular surface disease (corneal pigmentation, vascularisation, ulceration). In giant

breeds the excessive skin leads to ectropion (sometimes in combination with entropion) with exposure of the conjunctiva. Droopy upper eyelids can lead to reduced vision.

Shortening of the eyelids is recommended to correct both presentations. Surgical techniques however vary between the two.

In brachycephalic dogs a macroblepharon is usually corrected by shortening and reconstructing the medial or lateral canthus. Different surgical procedures are described in the literature. The site of correction (medial or lateral) should depend on the globe position and the extent of the scleral show. In most pugs for example a medial canthoplasty will provide the best results. The palpebral fissure will be reduced in size, which will also give additional protection from nasal fold trichiasis and will also correct the commonly seen medial canthal entropion. Since the palpebral fissure will significantly stretch with time the surgeon should aim to slightly overcorrect the size of the palpebral fissure for a good long-term result.

In giant breeds different surgical approaches can be used. It is often the lower lid that is particularly long so that a shortening of the lower lid alone will resolve the problem. This can be done with a house-shaped wedge resection similar as utilized for the removal of eyelid tumours. If both, the upper and lower eyelid are too long a lateral canthoplasty will be the recommended technique.

In case of a combined problem of macroblepharon and entropion different surgical techniques can be used that combine rolling out the lid margin as well as shortening it. Examples are the surgery after Read and Broun, which is a combination of a Celsus – Hotz technique and a wedge resection, and a modified Khunt – Szymanowski technique, where a Celsus – Hotz technique is combined with a partial lid splitting and staggered wedge resections. Both techniques require significant experience of the surgeon.

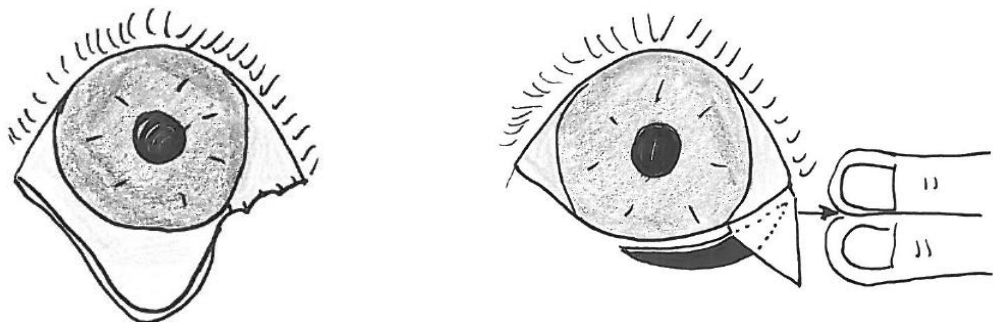


Figure 5 Read and Broun technique for the correction of macroblepharon and lower lid entropion.

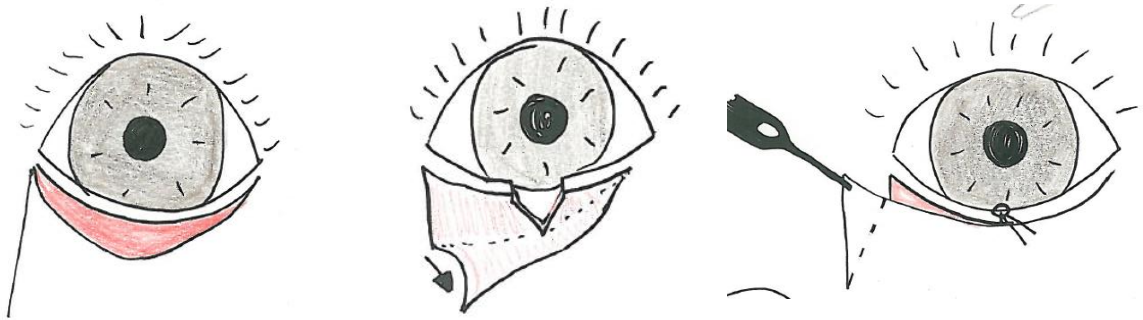


Figure 6: modified Kuhnt – Szymanowski technique for the correction of macroblepharon and lower lid entropion

Entropion

The enrolling of the eyelid often leads to painful hair contact with the cornea and conjunctiva and can lead to cornea ulceration, vascularization, pigmentation and fibrosis. Depending on breed and face conformation there are a number of different types of entropion that require different surgical techniques.

Entropion can affect the upper and/or lower lid, the medial canthus and can occur in a combination of ectropion and entropion in patients with a macroblepharon. An upper eyelid entropion is often combined with a loose facial mask that is increasingly pulling down, particularly in older dogs as is commonly seen in English Cocker Spaniels. The drooping upper eyelid can lead to upper eyelid trichiasis and even significantly reduce in vision.

Surgical techniques can be divided in temporary and permanent procedures, with the former being used to correct mild to moderate forms of entropion and secondary entropion caused by painful ocular disease, treatment of patients that cannot be anaesthetized or where a permanent correction is not yet advisable (puppies, infected periocular skin). Temporary techniques include eyelid tacking and the injection of subdermal fillers.

During eyelid tacking periocular skin folds are created and sutured together using a monofilament, non – absorbable suture material (4-5/0) and single or mattress sutures to effect. An overcorrection is recommended as the effect will wear over time. Depending on the technique this may last few days to several weeks. Patients should wear a buster collar to prevent the removal of the sutures.

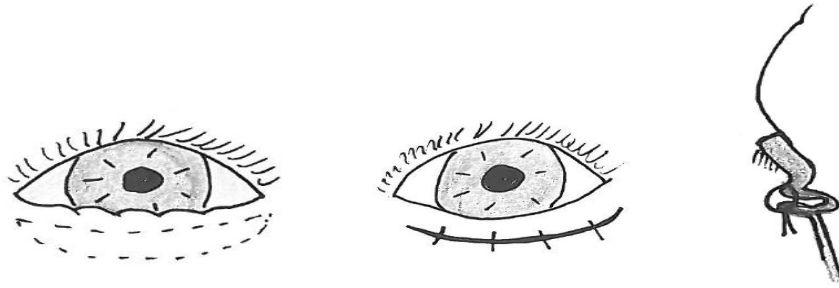


Figure 7: Tacking sutures for the temporary correction of entropion

Subdermal collagen injections may be performed on cooperative awake patients. Hyaluronic acid is injected into the eyelids. The eyelids thicken and the hair is directed away from the ocular surface. Only mild forms of entropion can be corrected this way. The treatment may last for 6 – 12 months and can be repeated if needed.

Permanent techniques to correct entropion will be discussed in the second part of this Mini Series.

Summary

Eyelids are essential for the protection and health of the ocular surface. Care should be taken to consider the anatomy and aim for restoring the natural function of the eyelids. Surgical interventions on the eyelids should be performed with suitable magnification and instrumentation to achieve good results.