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The eyelid skin is amongst the thinnest skin of the body and requires delicate handling. The function of the eyelids should be remembered when planning and executing eyelid surgery. It is important to maintain the ability to blink and to ensure that the eyelid margin integrity is maintained and that its relationship to the surface of the globe is maintained or normalized as necessary. Magnification is required for both detailed examination and accurate surgery of the eyelids. This can be achieved by surgical loupes. Good illumination is also required. Instrumentation for eyelid surgery should be fine and non-traumatic to the tissues. Suitable suture material should be selected for the eyelid skin, palpebral conjunctiva and subcutaneous tissues.

Instrumentation
A few fine gauge instruments should be available for eyelid surgery:
- **Forceps**: eyelids may be grasped using Brown-Adson or larger Bishop-Harmon forceps, while conjunctiva is best grasped using more delicate Bishop-Harmon
- **Scissors**: Tenotomy scissors are useful for finer work, particular involving the conjunctiva. Light-weight Mayo or Metzenbaum scissors are useful.
- **Blades**: A #15 Bard-parker or #64 or #69 Beaver blade are useful for eyelid surgery
- **Hemostasis**: micro mosquito hemostats are useful. Fine electrocautery or radiofrequency units can be useful, particularly in more extensive eyelid surgery.
- **Needle holders**: For sutures larger than 6-0 a Derf needle holder is suitable; for needles swaged onto 6-0 or finer sutures a Castroviejo needle holder is suitable.
- **Specialized instruments**: Cilia forceps e.g. Barraquer cilia forceps. Jaeger lid plate – this is useful for immobilizing the eyelid for making incisions in the rather mobile eyelid skin. Chalazion clamps (e.g. – useful to immobilize lid and also for controlling bleeding to allow surgical field to be visualized (e.g. excising ectopic cilia, curettaging chalazia). For curettage of chalazia a Meyerhoefer chalazion curette is useful.

It is worth protecting the finer instruments by placing them in a suitable protective instrument holder.

**Sutures**: Relatively fine suture material is required for use in the thin skin of the eyelids. For buried sutures an absorbable suture such as Vicryl (Ethicon) (typically about 6-0 or 5-0 for larger dogs) is suitable. For the skin for minor procedures such as entropion repair of wedge resections Vicryl or Vicryl Rapide is suitable, again 6-0 is a suitable size. For major reconstructions buried sutures of PDS or Monocryl can be used and the skin sutured with monofilament nylon, but for suturing close to the eyelid margin a braided coated product such as Neurolon may be preferred because it is a softer material. When suturing eyelids a few basic principles should be remembered:
• Accurate anatomic reconstruction is required – eyelid movement and function should be considered. In particular, accurate reconstruction of the eyelid margin should be achieved so the cornea is protected
• Suture ends and knots must not contact the cornea

Correction of abnormal eyelid position
Positional lid abnormalities such as entropion and ectropion are common in dogs and less common in cats.

Entropion
It is important to properly evaluate eyelid anatomy and function prior to undertaking any blepharoplastic procedure. A “no-touch” eyelid evaluation should be performed initially. Eyelid function should then be assessed by stimulating a blink reflex; make note of the amount of eyelid malalignment. The examination is then repeated in the same manner after application of a topical anesthetic; this removes the spastic component of entropion leaving the anatomical deformity that requires correction.

Temporary eversion: Entropion in very young puppies (common in breeds such as Shar Peis) should be temporarily corrected using a “tacking” procedure. This prevents the development of corneal damage and allows the puppy to grow prior to permanent correction. Two or three sutures are applied per lid. The first bite of skin is taken perpendicular to the eyelid margin at about 2 to 3 mm from the eyelid margin directed away from the eye. A second bite of skin is taken further away from the eyelid margin and then as the suture is tied the eyelid is everted. A braided material should be used such as Vicryl or Neurolon. The procedure may need repeating prior to performing any permanent correction that may be necessary.

Modified Hotz-Celsius Correction: Most entropions can be corrected with a simple modified Hotz-Celsius procedure, that most practitioners are familiar with. This is simple and effective. A Jaeger lid plate is useful to immobilize the lid. The first skin incision should be made about 2 to 3 mm from the eyelid margin. A common mistake is to make the incision too far from the eyelid margin; then there is a greater risk of over correction. The width of skin excised is adjusted dependent on the degree of inturning (assessed pre-operatively after a topical anesthetic was applied).

Dealing with the overlong eyelid: In some dogs with entropion an overlong eyelid is a major contributory factor and there may be central ectropion and lateral and medial entropion (the “diamond eye”). In such instances a more complex repair will be needed combining eyelid shortening and eversion in the necessary regions. Procedure to slide the lower eyelid laterally combined with shortening of the eyelid can be used. If there is lateral canthal laxity a procedure to anchor the lateral canthal region to the zygomatic arch combined with lid shortening may be needed. In some dogs with an overlong eyelid just lower eyelid ectropion results; repair in such cases is only justified if problems are arising from excessive conjunctival exposure.

Upper eyelid atonic entropion/trichiasis: This is a common problem in older English cocker spaniels. The trichiasis results in keratitis and conjunctivitis and may lead to reduced tear production. A Stades procedure is very effective in dealing with this problem. This involves removing a relatively wide strip of skin from the upper eyelid (while maintaining the eyelid margin) and then partially closing the skin defect.
This results in a strip that heals by second intention and results in a region of hairless scar tissue adjacent to the eyelid margin. The advantage of this is that as the facial skin becomes even more “droopy” there are no hairs adjacent to the upper eyelid margin to start contacting the ocular surface.

Medial lower eyelid entropion: This is different to the typical entropion that involves the rest of the eyelid. It is common in small breed dogs and may contribute to the development of epiphora. Correction can be by removal of a strip of skin to evert the involved portion of eyelid or, when it is combined with caruncular hair trichiasis and an overlong palpebral fissure, a medial canthoplasty can be performed. This procedure basically involves removing a strip of eyelid margin from the lower and upper eyelids and the hair-bearing mucosa at the medial canthus. Care is taken to preserve the nasolacrimal puncta and canaliculi. A two-layer repair is performed. The affected breeds tend to be small making the surgery rather fiddly – magnification is recommended.

Cilia abnormalities
Distichiasis, ectopic cilia and trichiasis are conditions whereby hairs or cilia can contact and irritate or damage the ocular surface.

Distichiasis
This is a very common condition in dogs. Careful assessment should be made to ascertain how much of a clinical problem the condition truly is. Some hairs bend away from the cornea and others may be very fine and float in the tear film and apparently cause little or no irritation. Removal may be by plucking (temporary) or destruction of the follicle by cryotherapy or electrolysis.

Ectopic cilia
These invariably cause ocular irritation and often corneal ulceration. They can be difficult to see and magnification is usually essential to allow them to be detected. Removal with the aid of magnification is recommended. A chalazion plate is applied and the mucosa surrounding the hair is excised and the follicle removed. Electrolysis and cryosurgery are alternative options.

Trichiasis
Trichiasis can arise from nasal folds, long hairs that bend round onto the cornea, hairs on the medial caruncle, the result of inturning eyelids (entropion) or following eyelid scarring. Correction may just require hair trimming or surgical procedures may be needed such as nasal fold excision, caruncular mucosa excision or medial canthoplasty or some other corrective procedure to redirect the hairs away from the cornea.

Reconstructive surgery
Reconstructions are indicated for congenital defects such as colobomas, following trauma and lacerations and reconstruction following excision of lid masses.

Simple lacerations should be sutured without delay. Minimal debridement is needed as the eyelids have a very good blood supply and it is unusual to have devitalized tissue. Accurate anatomical reconstruction is important, particularly of the eyelid margin. If the nasolacrimal system is involved it should be cannulated and an
A figure of eight suture is very useful for repairing the eyelid margin.

**Dealing with small eyelid masses**

It is important to achieve a histological diagnosis of the lesion to ascertain the margins required for excision. If the lesion in a dog has all the characteristics of a papilloma or adenoma then excisional biopsy is recommended. Lesions with a less obvious diagnosis and all eyelid lesions in cats should be biopsied to see if they are neoplastic and then the appropriate management approach selected. If an excision involving less than one-third of the eyelid length is required a simple excision with direct closure is suitable. More extensive lesions will require a reconstructive procedure unless the animal has excessive eyelid length (as is the case in many breeds of dog). A V-shaped or house-shaped full thickness excision removing the lesion is utilized. This should be symmetrical in shape so that an accurate reconstruction will be easier. Buried sutures are usually used and the eyelid margin should be constructed with care – the Meibomian gland orifices along the eyelid margin are useful landmarks for ensuring accurate reconstruction of the eyelid margin. A figure of eight suture is very useful to reform the eyelid margin; it gives a strong repair with the suture ends away from the cornea.

**Major eyelid reconstruction**

Major reconstructions may require specialist surgery. There are a number of techniques available that are useful for reconstruction of the eyelids where an excision of more than one third of the eyelid margin is required. These include:

- Sliding lateral canthoplasties to allow for lengthening of an eyelid
- Rotation and advancement flaps
- Mustardé technique to utilize the lower eyelid to reconstruct the upper eyelid
- Lip to lid flap
- Axial pattern flaps such as superficial temporal axial pattern flap; caudal auricular axial pattern flap

Considerations when selecting a technique are:

- Always preserve eyelid closure – otherwise there is a significant risk of exposure keratitis developing
- The upper eyelid margin has greater movement over the cornea than the lower eyelid and preservation/reconstruction of a normal upper eyelid margin is important.
- When skin flaps are used the reconstructed eyelid should be lined with conjunctiva via a flap or a mucosal graft
- Ensure sutures can not rub on the cornea