Modification of the orbital rim anchorage method for surgical replacement of the gland of the third eyelid in dogs

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Many breeds of dogs are prone to develop dorsal prolapse of the gland of the third eyelid, commonly known as cherry eye,¹ and it has been suggested that the connective tissue attachment between the base of the gland and the periorbital tissue is poorly developed in dogs with this condition.² Surgical treatment consists of replacement or excision of the prolapsed gland. However, complete excision of a prolapsed gland may result in development of keratoconjunctivitis sicca (KCS), especially in dogs that have a breed predisposition for KCS.³ ⁶ In young Beagles, gland excision resulted in only a slight decrease in Schirmer tear test values, compared with values recorded after gland replacement; however, Beagles are not predisposed to KCS, and KCS generally develops in adult or geriatric dogs.⁸ In a review of 125 dogs with prolapse of the gland of the third eyelid, KCS developed in only 14% of dogs in which the gland was replaced, but in 48% of dogs in which the gland was excised, and in 42% of dogs that were not treated surgically.⁹ Therefore, gland replacement is clearly preferable to gland removal.

Many methods of gland replacement have been described,¹ ³ including one that involves suturing the prolapsed gland to the periosteum of the ventral periorbital rim.³ This method avoids damaging the ducts of the third eyelid gland, which are on the bulbar surface of the third eyelid,¹⁰ and does not require suturing to the sclera, a procedure which risks intraocular perforation. However, placement of the suture can sometimes be difficult, particularly in dogs with tight eyelids or a small ocular fissure, because it involves blindly making a hairpin turn with the needle and suture within the recess of the ventral fornix. Furthermore, when the globe is located dorsally in a large orbit, the distance between the ventral fornix and the orbital rim is greater than usual, which also makes suture placement more difficult.

Failure to achieve a secure bite of the orbital periosteum can lead to inadequate repositioning or subsequent reprolapse of the gland. Therefore, a modification was needed to allow easier and more accurate placement of the suture through the orbital periosteum. The purpose of this report is to describe such a modification.

Surgical Technique

Hair beneath the eye was clipped, and the eye and facial skin were cleansed with 1% povidone iodine in sterile saline (0.9% NaCl) solution. A skin incision approximately 5 mm in length was made parallel and subjacent to the ventral periorbital rim (Fig 1A), and a second incision was made parallel to the initial skin incision in the center of the ventral conjunctival fornix. Nonabsorbable, monofilament suture and a curved cutting needle (eg, nylon, 3/8 circle cutting needle) were used; suture size was selected on the basis of the size of the dog (eg, 2-0 suture for English Bulldogs and 4-0 suture for Miniature Poodles). An assistant retracted the third eyelid, stretching it dorsally to allow exposure of the ventral conjunctival fornix (Fig 1B). The needle was inserted through the skin incision and directed toward the ventral orbital rim to obtain a bite of the periosteum of the orbital rim. It was then directed to exit through the incision in the ventral conjunctival fornix (Fig 1B). Another needle was then placed on the other end of the suture and directed in a similar manner to obtain a second bite of periosteum. Both ends of the suture were then exiting from the ventral conjunctival fornix incision. One needle was reinserted through and directed dorsally through the substance of the gland so that it emerged from the dorsobulbar aspect of the prolapsed gland (Fig 1C). The assistant then reflected the third eyelid toward the surgeon to expose the bulbar surface, and the needle was directed back through its last exit hole and horizontally across the dorsal prominence of the prolapsed gland so that it again emerged from the dorsobulbar aspect of the gland (Fig 1D). Finally, the needle was again inserted through its last exit hole and directed ventrally through the gland to emerge from the ventral conjunctival fornix incision (Fig 1E). The assistant then reflected the third eyelid...
Dorsally to allow the surgeon a view of the ventral fornix, and the surgeon tied the suture tightly. The conjunctival and skin incisions were not sutured. The result of the procedure was a permanent, subconjunctival ligature that encircled the body of the gland and cartilage of the third eyelid, anchoring the gland to the periosteum of the periorbital rim and the overlying periorbital muscle (Fig 1F).

**Discussion**

Various minor modifications could simplify the procedure even more. For instance, the steps used to encircle the gland can proceed in a clockwise or counterclockwise direction, according to the surgeon's preference. Generally, one direction or the other will be more convenient, depending on whether the left or right eye is affected and whether the surgeon is left- or right-handed, because the dog's nose can limit the surgeon's range of motion during suture passage. Also, if the surgeon has difficulties finding the conjunctival fornix incision, the needle can be directed to exit as close as possible to the fornix incision. Suture passage is completed as described, but before the first throw for the knot is tightened, the conjunctiva is snipped to create a pocket to accept and bury the knot.

In exophthalmic dogs with a tight lid-globe conformation and a deep ventral fornix, it may be difficult to expose the ventral fornix. In these dogs, we find it more convenient to skip the conjunctival fornix incision entirely. We make a long (2 cm) skin incision and insert the needle parallel to the...
orbital rim to obtain a bite of the orbital perios-
tectum. We then thread a long (1 to 2 inches), 3/8
or 1/2 circle cutting needle onto the suture and
direct the needle through the ventral orbicularis
muscle so that it passes below the conjunctival for-
nix without perforating the conjunctiva. We use
forceps to place the third eyelid tissue onto the need-
le, as if we were threading beads, until the needle
exits from the dorsobulbar aspect of the prolapsed
gland (Fig 1C). The needle is again directed hori-
zontally across the gland (Fig 1D) and then ven-
trally to exit from the skin incision. The knot then
is tied tightly and lies under the skin. To ensure
that the knot will not be exposed, the skin incision
is sutured with 5-0 absorbable suture.

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Small Animal Orthopedics is
an admirably illustrated, first-
edition book intended to pro-
vide an illustrated description
of most common small animal
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book is divided anatomically,
with sections on the head, fore-
limb, hind limb, foot, joints,
vertebral column, and special
surgeries. The author has illus-
trated selected surgical treat-
ments for most canine fractures
and other conditions including
osteochondrosis, tendon repair,
cruciate rupture, amputation,
hip dysplasia, joint luxation,
and neurosurgery. Surgical
techniques described for each
condition include a surgical ap-
proach, selected treatment
method, and a discussion of
postoperative care and potential
complications. Recommend-
tions for repair of long-bone
fractures are specific for each
bone and fracture configura-
tion; indications for ortho-
pedic appliance and ex-
trapolation of those indica-
tions to different bones are not
described. Surgical techniques
selected for each condition are
presumably the most common
in the author's experience, and
the text does not attempt to ad-
dress accepted alternative surgi-
cal approaches or treatments
for many conditions.

Clear, good-quality illustra-
tions are numerous throughout
the book and consist princi-
pally of drawings or radio-
graphs accompanied by com-
plete figure legends. Selected
procedures are illustrated by in-
traoperative photographs, but
illustrations of certain proce-
dures, such as amputation, may
not provide sufficient informa-
tion to guide inexperienced sur-
geons. The price of the text is
moderately high, compared
with related texts and the rela-
tive quantity of information,
but reflects the massive quan-
tity and quality of illustrations.
Small Animal Orthopedics
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benefit from the surgical experience
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