

# Proptosis Reduction

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**P**roptosis of the globe (**Figure 1**) is a true ocular emergency. The eyelids become trapped behind the equator of the globe, usually from trauma. The eyelid margins are seldom visible, and the patient is unable to blink and protect the cornea. Treatment delay and resultant elongated globe exposure can increase the likelihood of corneal ulceration, retrobulbar edema, and hemorrhage, raising the risk for blindness from globe perforation or optic nerve damage.

The force necessary to proptose a globe varies with orbital anatomy. Proptosis occurs more easily in brachycephalic breeds (both canine and feline) than in mesocephalic or dolichocephalic breeds, improving the odds for sight and globe retention in the former. The prognosis for vision is generally guarded to poor, but prompt treatment may save the globe. Enucleation may be best if the globe is ruptured or  $\geq 2$  extraocular muscles or the optic nerve is avulsed. If the status of the eye and muscles cannot be determined, proptosis should be reduced and a temporary tarsorrhaphy placed. The globe can be removed later if necessary, but it cannot be replaced.

Following surgery, the eye should be monitored for signs of keratoconjunctivitis sicca, a common sequela that requires frequent, diligent, and long-term medical therapy even if the globe has been rendered nonvisual. If owners are unwilling or unable to provide long-term care following resolution of proptosis, enucleation at initial presentation may be warranted.

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Proptosis in an Australian shepherd puppy

## What You Will Need:

- Small scissors (Stevens tenotomy, strabismus, Mayo, or Metzenbaum)
- Needle drivers
- Small forceps (Bishop-Harmon, toothed)
- Nonabsorbable suture (4-0, nylon or silk; 3-0 to 4-0 for dogs with thick eyelid margins [eg, English bulldogs])
- Stents (pieces of wide rubber band material or IV tubing or buttons)
- Topical ophthalmic antibiotic or lubricating ointment

## Step-by-Step ■ Proptosis Reduction

### Step 1

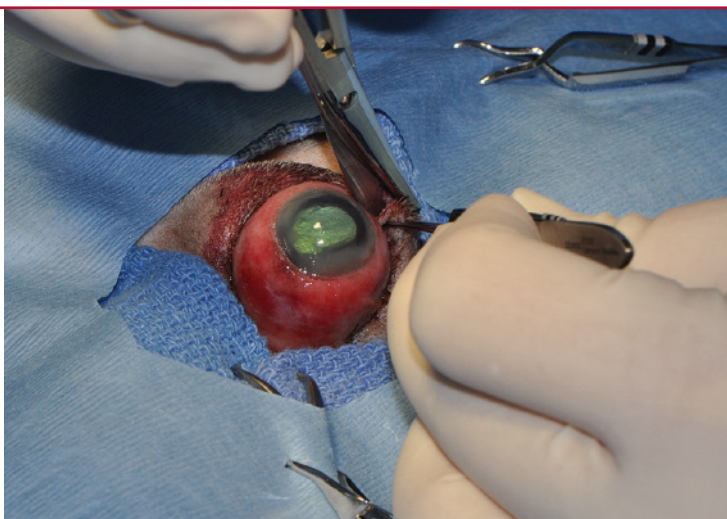
Administer systemic analgesic and protect the cornea by applying a topical lubricant (eg, ophthalmic antibiotic ointment) immediately on presentation. Assess the patient's general physical condition; when the patient is stable, induce general anesthesia. Evaluate the globe's condition, particularly the cornea, to determine whether globe replacement or enucleation is indicated; check for intraocular muscle integrity, vision, hyphema, and pupillary light reflex. Clip and prepare eyelids and corneoconjunctival surfaces; remove debris from the cornea and conjunctiva with sterile saline or lactated Ringer's solution.



**Author Insight** To clean and prepare ocular surfaces and conjunctival fornices, use dilute povidone-iodine with saline to 0.5% (light brown, resembling weak tea). Swab lid margins and fornices (if accessible) with a sterile cotton-tipped applicator. Rinse the povidone-iodine solution from the eye with sterile saline or eye wash. Do not apply povidone-iodine scrub or other chemical preparations (eg, chlorhexidine) to ocular surfaces; doing so can cause corneoconjunctival ulceration.

### Step 2

A releasing lateral canthotomy allows eyelid margins to be lifted from behind the globe's equator and returned to their normal anatomic position. Use scissors to make a full-thickness incision extending laterally from the lateral canthus, as if to extend the length of the palpebral fissure. Be generous with the incision (ie, ~1 cm). Using forceps, roll the eyelid margins into their normal orientation, facing forward and rostrally.

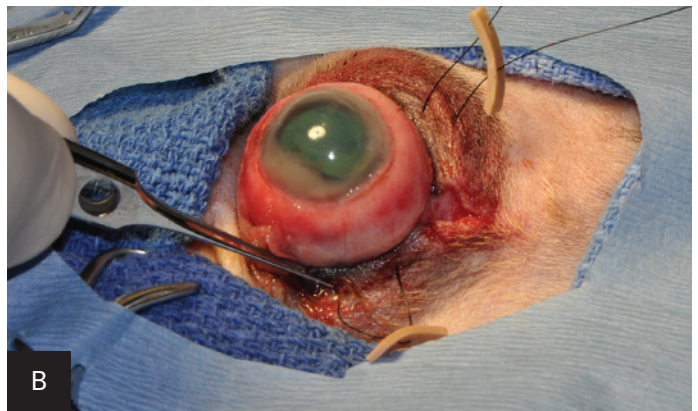
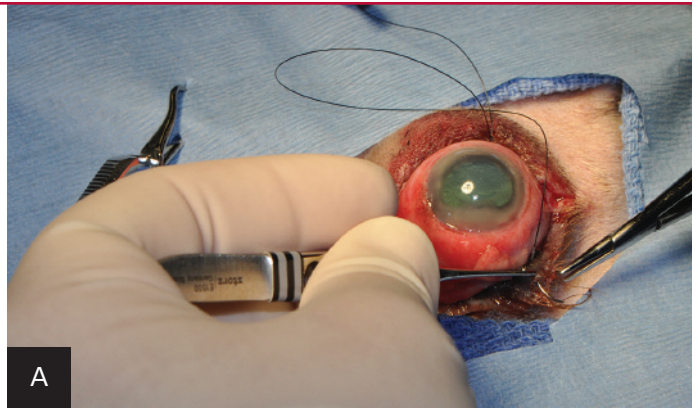
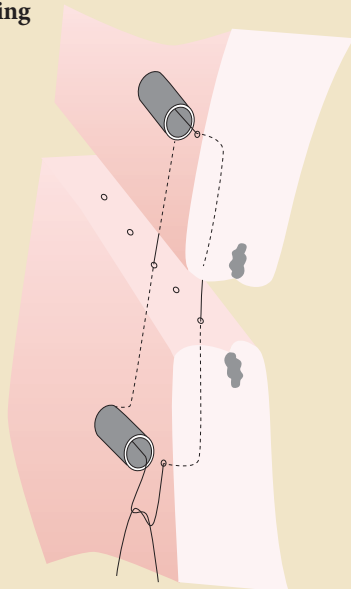


### Step 3

Place a temporary tarsorrhaphy to protect the globe from exposure. Preplace 2–4 partial-thickness horizontal mattress sutures in the eyelids across the palpebral fissure. This facilitates placement of remaining sutures in the correct tissue plane (partial thickness exiting the meibomian gland openings) and proper positioning of the lids over the globe. Pass the suture first through the stent and then through the skin of the eyelid ~5 mm from the eyelid margin (A), directing it toward and exiting along the lid margin at the level of the meibomian gland openings. Leave the suture material untied over the globe across the palpebral fissure. Direct the needle through the meibomian gland openings on the opposite lid, exiting the skin ~5 mm from the lid margin; then reverse the entire procedure (B, C). Tie suture ends after all have been placed.

**Author Insight** Using stents (typically small piece of rubber band or IV tubing) reduces skin tension from the suture material, limits the possibility of pull-through and subsequent breakdown of the tarsorrhaphy, and helps prevent pressure necrosis of the eyelids.

**Author Insight** Proper placement of the horizontal mattress suture for the temporary tarsorrhaphy is critical. Suture should be snug enough to avoid any space between the upper and lower eyelids and prevent it from contacting the cornea, especially after periocular swelling begins to subside.

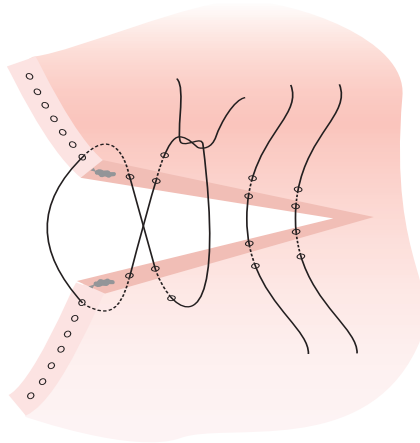


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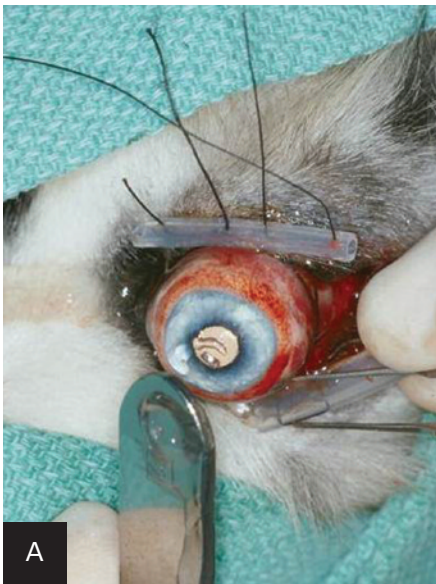
## Step 4

Close the canthotomy before tightening the tarsorrhaphy sutures for ease of exposure. Close the canthotomy with a figure-of-eight suture to reappose eyelid margins at the lateral canthus. To prevent suture material from protruding through the palpebral conjunctiva and irritating the cornea, do not place the suture through the full thickness of the eyelid. Exit the suture through the meibomian gland openings. Close the remaining incision with simple interrupted sutures.

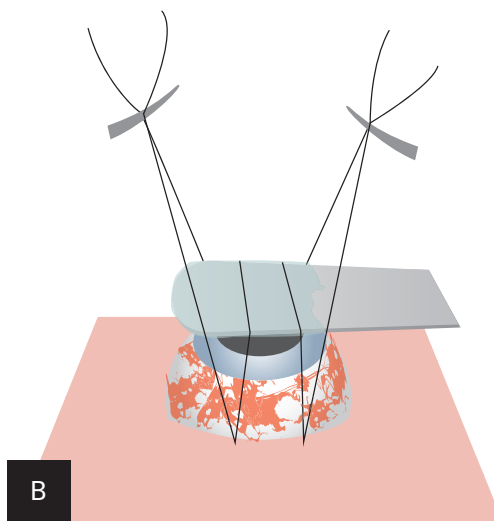


**Author Insight** Placing the initial suture at the lid margins of the lateral canthotomy site allows proper realignment of the margin, thereby maintaining normal anatomic position and function of the eyelids.

## Step 5



Once the tarsorrhaphy sutures are in place, place a lubricated scalpel handle (A) over the cornea underneath the sutures. If possible, try not to press down on the cornea with the instruments. Draw up on the sutures simultaneously (B) to bring the lids into a closed position over the globe. Placing a flat, smooth implement between the sutures and the cornea prevents (1) the sutures from irritating the cornea and (2) forward movement of the globe while the eyelids are being pulled up. Tighten and tie each suture (C).





**Author Insight** The medial canthus of the palpebral fissure is usually left open a few millimeters to allow topical medications to be applied to the ocular surface. Alternatively, one of the tarsorrhaphy sutures can be left with long tags that can be tied in a bow (rather than a knot) and can be opened and closed as needed to apply medication or check the globe's status.

#### Step 6

Postoperative systemic medical therapy should include broad-spectrum systemic antibiotics (especially if the injury was sustained during an encounter with another animal), systemic antiinflammatory medications (usually steroids in case optic neuritis is present), and analgesics in addition to topical broad-spectrum antibiotic ointments (q6h) and 1% atropine (q8–12h). The tarsorrhaphy sutures should remain in place as long as they are secure but for at least 2 weeks (sometimes up to 4 weeks). If lagophthalmos persists after suture removal, replace the sutures for a few more weeks, then remove the sutures sequentially, not all at once.

Temporary or permanent lateral strabismus is common after proptosis. ■ **cb**



Lateral strabismus after proptosis

**Author Insight** If exposure keratitis continues to cause problems, permanent partial lateral tarsorrhaphy or medial canthoplasty to shorten the palpebral fissure length and provide greater coverage for the globe may be indicated.