

# Surgical Treatment of Canine Glaucoma

## Filtering and End-Stage Glaucoma Procedures



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### KEYWORDS

- Canine • Dog • Glaucoma • Gonioimplants • Glaucoma drainage devices
- Enucleation • Evisceration • Chemical ablation of ciliary bodies

### KEY POINTS

- Surgical strategies for glaucoma are aimed at controlling intraocular pressure through procedures that either decrease aqueous humor production, increase its outflow, or through a combination of both.
- Gonioimplants or glaucoma drainage devices are used alone or in combination with cyclo-destructive procedures to decrease intraocular pressure by diverting aqueous humor from the anterior chamber to the subconjunctival or frontal sinus spaces.
- Medical treatment, by means of topical anti-inflammatory and glaucoma medications, is still required long-term in the postoperative management of filtering procedures.
- Bleb fibrosis, caused by severe inflammatory response in the subconjunctival tissues, represents a common complication of filtration surgery in dogs, eventually leading to implant failure.
- Modulation of wound healing is the key to a successful management of postoperative filtering devices, through proper surgery timing and control of inflammation.

### INTRODUCTION

Glaucoma is a group of diseases that commonly leads to vision loss in cats and dogs. Although the definition of the disease has evolved over the years to indicate a neurodegenerative disorder of retinal ganglion cells and their axons, an increase in intraocular pressure (IOP) represents a constant risk factor in dogs and the only available therapeutic target. The goal of glaucoma therapy is to prevent further optic nerve damage and preserve vision. Because of the rapidly progressive course of canine primary

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glaucoma, early surgical intervention has been suggested to improve the surgical outcome.<sup>1</sup>

Surgical treatment of glaucoma is aimed at decreasing IOP in the affected eyes. This is attained through techniques that modulate the inflow/outflow of aqueous humor (AH), by decreasing its production and/or increasing its drainage (Fig. 1). Several different criteria affect the choice for the proper surgical treatment, with vision preservation or its potential recovery being decisive.

Cyclodestructive procedures (addressed elsewhere in this issue) and filtering techniques are used to control IOP in visual patients. The use of gonioimplants allows AH to be diverted from the anterior chamber to different venues, such as the subconjunctival, frontal sinus, or suprachoroidal and intrascleral spaces.

For blind glaucomatous globes, the main goal shifts toward pain and corneal complications management and quality of life for the patient. The primary aim of end-stage procedures is to control or prevent ocular discomfort (Fig. 2). Globe removal is obviously recommended when glaucoma is secondary to intraocular tumors, or to chronic inflammatory and traumatic conditions associated with blindness.

This article focuses on the description of the available filtering procedures in visual eyes, and of the salvage procedures in nonvisual patients.

## FILTERING PROCEDURES

Several surgical filtering procedures have been described in glaucomatous dogs including iridencleisis, cyclodialysis, corneoscleral trephination, and posterior sclerectomy.<sup>2</sup> They are unfortunately met with uniform failure and are only mentioned for historical purposes. The current technique in filtering procedures for canine glaucomas involves the use of anterior chamber shunts or glaucoma drainage devices (GDDs).

Trabeculectomy has long been considered the gold standard of filtering glaucoma surgery in people.<sup>3</sup> However, in recent years, studies aimed at comparing the long-term outcomes of trabeculectomy and GDDs implantation have drawn comparable results between procedures,<sup>4,5</sup> with the increased advantage of a more consistent aqueous outflow and decreased complications from hypotony in GDDs techniques.<sup>3</sup> Recent surveys have shown a significant increase in the use of GDDs over trabeculectomy in human patients with prior ocular surgery or with neovascular or uveitic glaucoma.<sup>6</sup>

Various different devices have been studied in canine patients over the years, from the Krupin-Denver model to the Joseph, Baerveldt, T-shaped nonvalved, and Ahmed

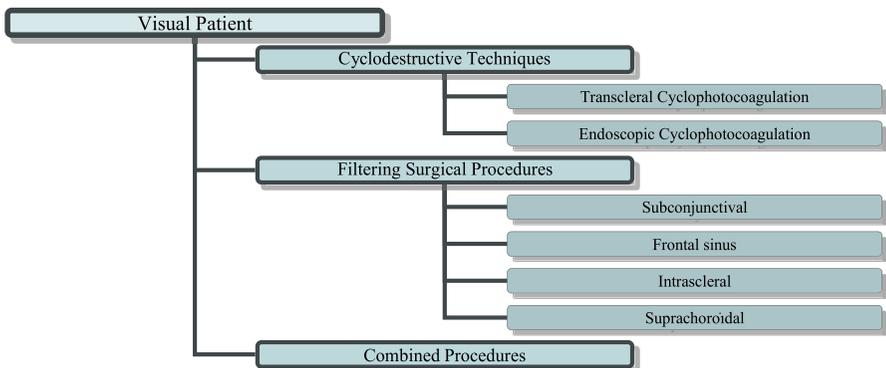


Fig. 1. Available surgical techniques for visual eyes.

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