A
cute corneal hydrops is a condition in which there
is a rapid development of corneal edema second-
ary to a break in Descemet membrane. Because
the conventional treatment has been
observation,1 acute corneal hydrops is a frustrating occur-
rence for clinicians and patients alike.
The condition occurs in patients with a history of ectatic
corneal conditions—keratoconus, keratoglobus, and pellu-
cid marginal corneal degeneration—and is due to a break in
Descemet membrane that allows fluid to enter the cornea.2-4
Patients present to the eye care specialist with a sudden
reduction in vision associated with a focal area of corneal
swelling, which can be small or large. The location and size of
the swollen area is related to where the linear break in
Descemet occurred. Previous treatment for hydrops consist-
ed of conservative approaches such as the use of hypertonic
saline solution with topical antibiotics and cycloplegic
agents. Patients are advised to avoid wearing contact lenses
until the condition has resolved, which may take anywhere
from 5 to 36 weeks with a conservative approach.5

INTRACAMERAL GAS

Intracameral gas injections are conventionally used to
repair detachments of Descemet membrane and as a
method for securing the donor’s disc in Descemet stripping
endothelial keratoplasty procedures. In 2002, the first inves-
tigation was published on the use of air for the rapid treat-
ment of acute corneal hydrops.6 Additional studies have
evaluated the effectiveness of two retinal gases: sulfur hexa-
fluoride (SF₆) and perfluoropropane (C₃F₈).2-10 Both SF₆ and
C₃F₈ gas used in nonexpansile concentration have pro-
duced earlier resolution of edema with fewer repeat injec-
tions compared with conventional treatment.

OUR EXPERIENCE

Based on the research, we have treated five patients at
our center with either C₃F₈ or SF₆. In all of the cases, the
corneal edema resolved in less than 2 weeks. However, as
mentioned in the published literature and in our experience,
the procedure and postoperative course are not risk free.
The biggest challenge is avoiding pupillary block, which will
result in a rapid increase in IOP. This complication occurred
in three of our five patients and was related to the pupil’s
not remaining dilated beyond the lower edge of the intra-
cameral gas level. Other risks include infection or anterior

Nonexpansile retinal gas can rapidly resolve corneal edema in patients with acute corneal hydrops.

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capsular cataract formation, the latter’s occurring in one of our patients following pupillary block and an elevated IOP.

**TREATMENT METHOD**

Based on our experience of a high rate of pupillary blocks, we now place an inferior peripheral iridotomy before injecting the retinal gas to help reduce the risk of elevated IOP. Our current treatment method for patients who present with acute corneal hydrops can be seen in the sidebar, *Acute Corneal Hydrops Treatment*.

**CONCLUSION**

In our experience, the placement of nonexpansile retinal gas for the treatment of acute corneal hydrops has been extremely effective for rapidly resolving corneal edema (Figures 1-4). Obviously, patients need to be cooperative and agree to lie supine with their heads facing the ceiling to allow the gas to block the entrance of fluid through the break in Descemet membrane. The other major challenge is to avoid pupillary block from the gas, with steps such as the placement of inferior peripheral iridotomies and the use of dilating eye drops. Overall, the development of this treatment has allowed patients to recover and return to contact lens wear in a matter of a week or 2 versus having to wait 1 to 8 months for the condition to resolve on its own.

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