

Postoperative Blindness

Sudden
Permanent
Preventable?



**Postoperative
Visual Loss
Registry**

www.asaclosedclaims.org

An anesthesiologist's role



Postoperative visual loss is a rare but devastating complication of non-ophthalmic surgery. This loss can be partial or total, and can affect one eye or both eyes. Ischemic optic neuropathy is a common diagnosis.

ARE MY SURGICAL PATIENTS AT RISK?

Yes. Visual loss can occur following uneventful cardiac, spine, vascular, reconstructive and other surgical procedures. Pressure on the globe does not seem to be the usual cause of postoperative visual loss.

WHAT CAUSES THE BLINDNESS?

The risk factors underlying postoperative visual loss are still theoretical. Some have been suggested in the medical literature:

- Intraoperative hypotension
- Anemia
- Prone position

WHERE DO I FIT IN?

You are a key player in the management of the patient's perioperative hemodynamics. If blindness occurs postoperatively, the anesthesiologist's care falls under scrutiny.

- Take a firm role in an investigation of visual loss.
- Establish a dialog with the patients — they may blame you for the vision loss.
- Immediately follow-up on all indications of abnormal vision, such as blurred vision or complaints of excessive light or darkness.

This booklet can aid you in understanding the pathophysiology of postoperative visual loss and the type of investigation that occurs when such a devastating event occurs.



Pathophysiology

The type of lesion in the eye or optic nerve causing the visual loss can rule out certain iatrogenic factors.

ISCHEMIC OPTIC NEUROPATHY

ISCHEMIA TO THE ANTERIOR OPTIC NERVE

- Optic disc edema on initial exam
- Vision occasionally improves

ISCHEMIA TO THE POSTERIOR OPTIC NERVE

- Initially normal fundoscopic exam
- Delayed edema to the optic disc
- Vision seldom improves

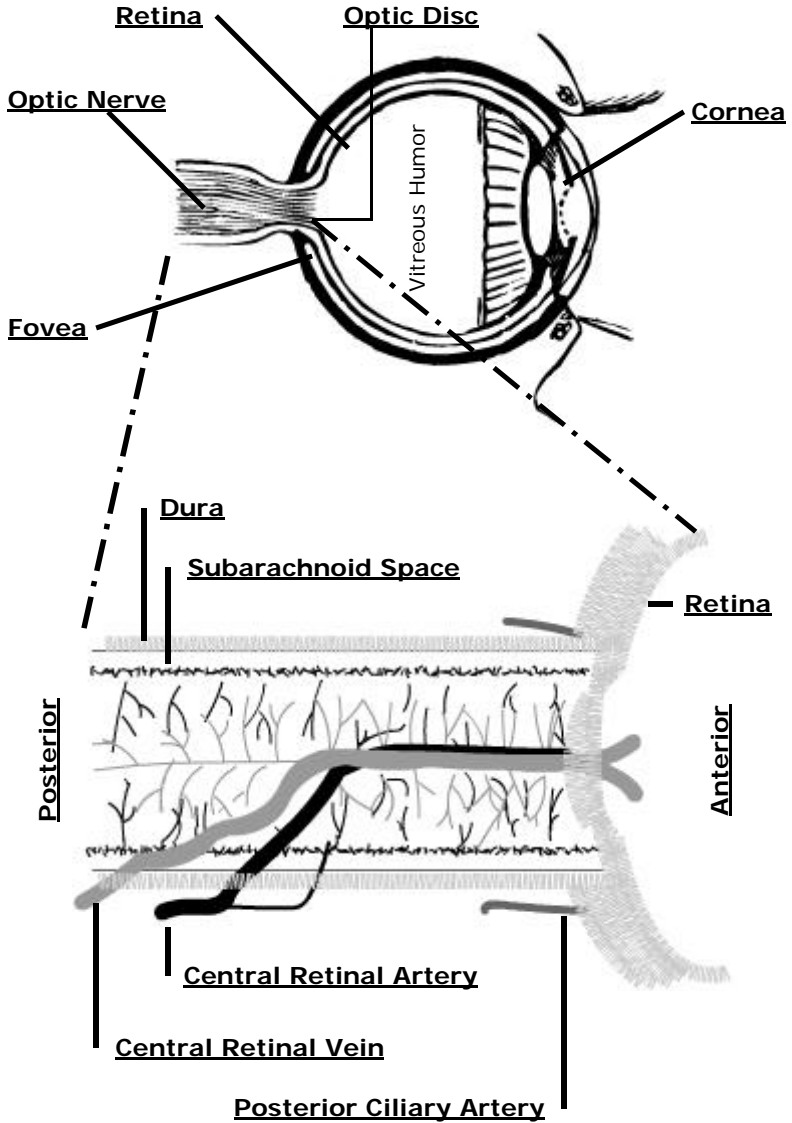
RETINAL ARTERY OR VEIN OCCLUSION

- Cherry red spot with retinal edema
- Carotid artery disease may be present
- Vision occasionally improves

CORTICAL BLINDNESS

- Normal fundoscopic exam
- Normal pupillary light reflex
- Vision frequently improves

Cross-section of the eye





A view of the optic disc



A NORMAL OPTIC DISC

The optic disc (the pale central region) as viewed with an ophthalmoscope. The optic nerve is receiving a sufficient supply of blood and nutrients.

Early anterior ischemic optic neuropathy (ION) will display an *abnormal* optic disc.

Early posterior ION will display a *normal* optic disc.



AN EDEMATOUS OPTIC DISC

The anterior portion of the optic nerve and the retinal optic fibers receive less blood. Edema may last 2-3 months.

Early anterior ION will display an *edematous* optic disc.

Late posterior ION will display an *edematous* optic disc.



AN ATROPHIED OPTIC DISC

An atrophied optic nerve results in permanent, possibly extensive vision loss.

Late anterior ION will display an *atrophied* optic disc.

Late posterior ION will display an *atrophied* optic disc.

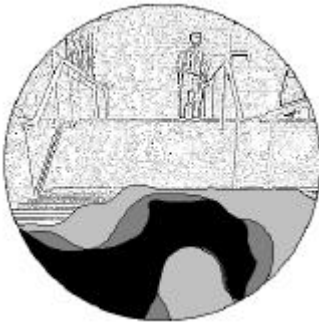


LOSS OF MOBILITY

The image to the left is an example of how a patient with anterior ischemic optic neuropathy might view the world.

Atrophy of the optic fibers in the upper portion of the retina has led to partial and total loss of visual acuity in the lower portion of the visual field.

Such blindness can hamper a patient's mobility, making everyday tasks such as walking, climbing stairs or cooking dangerous or impossible.



VARIABILITY IN VISUAL ACUITY

The image to the left shows the varying degrees of visual loss as noted in the image above.

Less atrophied areas show darkening and discoloration of the visual field. More atrophied areas have more complete loss of vision. The areas of atrophy are irregular in shape. Such damage can be unilateral or bilateral.



An ophthalmologic exam

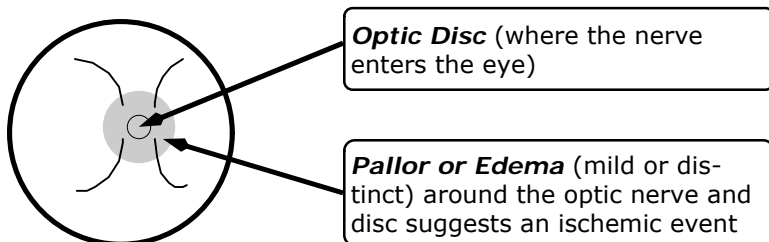
IMPORTANT ITEMS FOR AN ANESTHESIOLOGIST

Most ophthalmological evaluations are written up free-form — no two look exactly alike. However, the evaluations usually note similar properties of postoperative vision loss. Keep an eye out for these items on an evaluation:

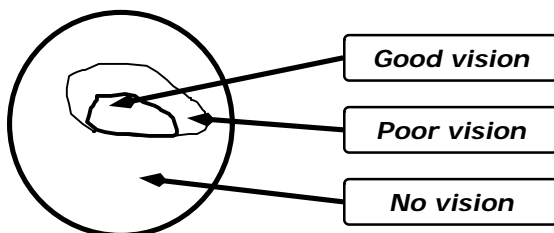
Decrease in pupillary response

Damage to the optic nerve usually results in an abnormal or absent pupillary light reflex.

Posterior Fundus Exam (PFE)



Visual Field Exam



Note: The ophthalmologist may attribute some of the findings to intraoperative hypotension, although other factors may be present.



EVEN PARTIAL BLINDNESS IS TRAUMATIC

Ischemic visual loss can impair many of the daily activities of a patient.

- Walking, climbing, cooking, typing, etc. can be severely curtailed. Depth perception may be impaired.
- Injuries may increase, due to falling, burns, etc.

PHYSICIAN—PATIENT RELATIONS

- **Know your patient:** Early postoperative check-ups can help with early assessment.
- **Involve yourself in the patient's care:** Follow the patient's perioperative course closely.

OUTSIDE HELP

Hospitals offer rehabilitative services. Organizations also exist that may aid patients once they have left the hospital.

National Foundation of the Blind

1800 Johnson Street
Baltimore, MD 21230
410-659-9314
www.nfb.org

American Council of the Blind

1155 15th St., NW, Suite 1004
Washington, DC 20005
202-467-5081 800-424-8666
www.acb.org

American Foundation of the Blind

800-AFB-LINE (800-232-5463)
www.afb.org

Blind Net

www.blind.net



WEBSITES

American Academy
of Ophthalmology
www.eyenet.org

International Foundation for
Optic Nerve Disease
www.ifond.org

National Eye Institute
www.nei.nih.gov

U. of Iowa Ophthalmology &
Visual Sciences
webeye.ophth.uiowa.edu

FURTHER READINGS

Hayreh SS: Anterior ischemic optic neuropathy. *Clinical Neuroscience* 1997; 4:251-263

Hayreh SS: Factors influencing blood flow in the optic nerve head. *J Glaucoma* 1997; 6:412-425 (Published erratum appears in *J Glaucoma* 1998;7:71)

Fern R, Ransom BR: Ischemic injury of optic nerve axons: the nuts and bolts. *Clinical Neuroscience* 1997; 4:246-250

Lessell S: Nonarterial anterior ischemic optic neuropathy. Enigma variations [editorial] *Arch Ophthalmol* 1999; 117: 386-388

Potarazu SV: Ischemic optic neuropathy: models for mechanism of disease. *Clinical Neuroscience* 1997; 4:264-269

Roth S, Thisted RA, Erickson JP, Black S, Schreider BD: Eye injuries after nonocular surgery. A study of 60,965 anesthetics from 1988-1992. *Anesthesiology* 1996; 85:1020-1027

Williams EL, Hart WM Jr, Tempelhoff R. Postoperative ischemic optic neuropathy. *Anesth Analg.* 1995 May;80(5):1018-29.

*Funding provided by the Professional Liability Committee
of the American Society of Anesthesiologists*

A study by the ASA Closed Claims Project

Postoperative Visual Loss Registry

c/o Karen Posner, Ph.D.

Box 356540

Anesthesiology

University of Washington

Seattle, WA 98195-6540

Phone 206-616-2630

Fax 206-543-2958

E-mail posner@u.washington.edu

www.asaclosedclaims.org