

PANRETINAL PHOTOCOAGULATION (PRP) FOR RUBEOSIS AND NEOVASCULAR GLAUCOMA

ERIC S. MANN M.D., Ph.D.

A. INTRODUCTION

Rubeosis involves the growth of abnormal blood vessels on the iris (the diaphragm-like structure which makes a round opening at the front of the eye). The rubeotic vessels eventually invade the drainage channels at the front of the eye, thus causing an increasing rise in the intraocular pressure. Abnormally high intraocular pressure associated with this condition is a type of glaucoma, which can cause severe damage to the optic nerve, resulting in visual loss. Marked redness, pain, swelling, as well as nausea or headache may also be associated with this condition. Such advanced symptoms may not be present if the condition is detected in its early stage. Panretinal photocoagulation (PRP) is the standard form of treatment to counteract this condition. It is usually preferable to perform PRP before the rubeotic vessels have a chance to block the drainage channels. However, even after the drainage channels have been blocked, PRP can still be performed to cause regression of these blood vessels in some cases.

B. BENEFITS

PRP attempts to arrest the progression of the abnormal blood vessels (rubeosis) which potentially can block the drainage angle. By stopping or slowing such growth, the high intraocular pressure can either be prevented or reduced. As a result, vision is hopefully preserved.

1. What PRP does NOT do:
 - a. Directly enhance the function of the macula (reading center)
 - b. Immediately improve vision
 - c. Guarantee visual improvement or stabilization

C. RISKS AND COMPLICATIONS

1. Common risks/complications:
 - a. Glare: May be present at least temporarily.
 - b. Photophobia: Sensitivity to light may be present at least temporarily.
 - c. Narrow visual field: Decrease in peripheral vision.
 - d. Decreased dark adaptation: Difficulty seeing in the dark.
 - e. Decreased central vision: At certain degree of decreased central vision (fine distal vision or reading vision) may be encountered after treatment on at least a temporary basis. Occasionally, a marked decrease in vision is experienced for prolonged or indefinite periods. The most common cause is cystoid macular edema (CME): swelling of the reading center. Bleeding, inflammation, etc are other causes.
 - f. Iritis/Uveitis: Inflammatory reaction in the eye, usually on a temporary basis and controllable by medications.
 - g. Corneal abrasion: Loss of the surface layer of the cornea (front clear structure of the eye). It is usually a minor defect, lasting for a short time.

2. Uncommon risks/complications
 - a. Retinal break: Development of a hole in the retina.
 - b. Retinal detachment: Separation of the retina from its normal position. This may be due to a retinal hole, traction (pulling of the retinal by scarring), or exudation (accumulation of fluid under the retina). The retina is the sheath of nerve tissue lining the back wall of the eye. Exudative retinal detachment usually resolves spontaneously, but the other types of detachment often need surgical intervention.
 - c. Increased cataract: Clouding of the lens.
 - d. Acute glaucoma (intraocular pressure rise): Increase in intraocular pressure to a range higher than acceptable due to various mechanisms are sometimes seen. This is usually temporary and can be controlled by medical intervention.

3. Other complications and risks not listed here may be discussed with you by the doctor.

D. ALTERNATIVES:

Panretinal cryotherapy (PRC) is the use of cold energy to form lesions on the retina. It is not as precise or as commonly practiced as PRP. It may be applicable when excessive haze prevents adequate viewing of the retina for PRP.

Occasionally, goniophotocoagulation (using the laser to directly coagulate the blood vessels at the drainage angle) can be performed to reduce the blockage. However, this method of treatment is usually thought to be beneficial only on a temporary basis.

Cyclocryotherapy (use of the cold energy to directly treat the ciliary processes, which produce the fluid in the eye, in order to reduce the intraocular pressure) can sometimes be performed. However, it is thought to be a method of last resort.

E. INDICATIONS FOR TREATMENT:

The final vision cannot be guaranteed. It can be better, same, or worse than before treatment. The rationale for PRP is to arrest the progress of the rubeotic vessels and to induce the regression of the rubeotic vessels. Sometimes, regardless of treatment, the drainage angle may still close up, cause persistent rise in intraocular pressure, in spite of regression of the abnormal blood vessels. Without treatment by PRP, the chance of severe visual loss is much higher. It provides a much higher chance for visual restoration.

F. POST-TREATMENT MANAGEMENT:

Specific eye drops are usually prescribed after treatment for a certain period of time. There is usually no restriction on activity. Sometimes, the patient is instructed to sleep with several pillows if there is blood in the eye. A follow-up appointment is given. If retrobulbar injection is given for a local anesthesia, the eye is patched with ointment for six to twelve hours.

PERIBULBAR & RETROBULBAR ANESTHESIA

Absence of pain (anesthesia) and immobilization of the eye (akinesia) are often necessary to allow effective laser and cryotherapy treatment or intraocular surgery. Both anesthesia and akinesia can be obtained to a variable degree by injection of anesthetic (Lidocaine and/or Marcaine) around and behind the eyeball prior to treatment or surgery.

The following are **common** effects of the anesthetic injection but are usually temporary:

1. Blurring of vision
2. Numbness and swelling around the eye
3. Ptosis (drooping of the eyelid)
4. Diplopia (double vision)

The following are **uncommon** complications of the anesthetic injection:

1. Retrobulbar or periorbital hemorrhage (bleeding behind or around the eyeball)
2. Globe perforation (puncture of the eyeball by the needle used for anesthetic injection)
3. Optic nerve injury or vascular damage (central retinal artery or vein occlusion)
4. Allergic reaction to the anesthetic
5. Seizure
6. Cardiorespiratory arrest (death)
7. Bilateral akinesia

These uncommon complications may result in permanent loss of vision, need for further surgery or treatment, or loss of the globe. Other less common complications may be discussed as well.

Post treatment care may include applying ointment to the eye and wearing a patch for 24 hours.

PROCEDURE NOTE

PATIENT: _____ **SS#** _____ **DATE:** _____
SURGEON: DR. ERIC MANN

PROCEDURE: PRP _____
INDICATIONS: (67228) _____

VA: OD _____ OS _____
VITALS

	Pre-op	Post-op
BP	_____	_____
P	_____	_____
R	_____	_____

INFORMED CONSENT:

All the risks, benefits, alternatives and intent of laser treatment with anesthesia were presented to the patient in an extensive discussion and in written form(s) attached. The patient understood that laser treatment is performed not to improve vision, but to hopefully stabilize vision and prevent further visual loss. The patient stated that he/she had a good understanding of his/her clinical situation, including the specific ocular and anesthetic risks (loss of vision, need for further surgery, and rarely, loss of globe) and consented to laser treatment.

TREATMENT: Under topical anesthesia
 Under retrobulbar anesthesia: with the patient supine and fixating straight ahead, 3 cc of 2% lidocaine were injected into the retrobulbar space, using a #25 gauge needle and a 10 cc syringe. Adequate anesthesia and akinesia were obtained. Following treatment, the eye was patched for 24 hours.

Using the argon green laser, grade 2 intensity burns were applied one spot width apart, remaining one disc diameter from the disc and two disc diameters from the foveola to the retinal periphery. Laser parameters and pattern (avoiding retina vessels) are below. Laser treatment was performed without complication. Post-operative photographs were requested. The patient tolerated the procedure well and left the laser suite in good condition.

PARAMETERS: 0.1-0.2sec, 500 micron(equivalent), _____mW & total spots _____.

POST-OPERATIVE CARE & MANAGEMENT: Pred Forte q.i.d. & Hyoscine b.i.d. for four days were prescribed. The patient was instructed to return in follow-up _____ or immediately upon any decreased vision, pain, side effects of the medication or symptoms of RD or RB (which were reviewed). Specific post-operative instructions included HOB elevated and restricted activities with no physical exertion. The need for diabetic control and the results of the DCCT were reviewed.

Physician Signature

**INSTRUCTIONS FOLLOWING LASER/CRYOTHERAPY
TREATMENT**

1. You may resume all of your normal activities immediately except for heavy lifting, exercise or physical exertion which you may resume in 3 to 4 weeks.
2. You may have discomfort or a headache following laser/cryotherapy treatment. Please take Tylenol but **NO** aspirin, Ibuprofen (Advil), indomethacin (Indocin) or other NSAIDS for pain unless your medical doctor recommends you take an aspirin a day for your heart or to “thin” your blood.
3. Due to intense brightness of the laser beam, there is a light-induced “dazzling” or “flashbulb” effect, and consequently your vision may be slightly decreased after the laser treatment. It may require a few hours to recover from this glare effect.
4. Please take pain pills as instructed and call immediately if you have persistent pain or sudden, new onset decreased vision at office phone number listed below or 866-856-7882 (after hours).
5. If you received retrobulbar anesthesia, keep the treated eye patched for 24 hours.
6. If you received eye drop prescriptions, please follow directions on the bottle.

**317 Salem Place Ste. 150
Fairview Hgts., IL 62208
Phone: (618) 632-8100
Fax: (618) 632-8101**

**533 Couch Ave., Ste 255
Kirkwood, MO 63122
Phone: (314) 835-9400
Fax: (314) 835-9401**

RECEIPT OF POST-OP INSTRUCTIONS

I _____ have been given postoperative instruction information. I have had the opportunity to read, understand and ask questions regarding my planned surgical procedure(s). Dr. Mann has explained this procedure to me in depth. I have been informed in regard to the potential benefits, complications, risk and alternatives of the procedure. Sufficient time was allowed for me to ask questions and these questions were answered to my satisfaction.

Patient signature

Date

Witness signature

Date

INFORMED CONSENT

I, _____ have been given the brochure(s) on Neovascular Glaucoma and Rubeosis and Peribulbar & Retrobulbar Anesthesia.

I have had the opportunity to read, understand and ask questions regarding this procedure(s). Dr. Mann has explained this procedure to me in depth. I have been informed in regard to the potential benefits, complications, risks and alternatives of the procedure. Sufficient time was allowed for me to ask questions and these questions were answered to my satisfaction.

Patient signature

date

Witness signature

time

CONSENT SPECIAL/INFORMED TO SURGERY OR OTHER PROCEDURE

Name: _____

Date: _____

Medical record number _____

1. I hereby authorize Dr. Mann and / or such assistants, associates, or other health care providers that may be selected by him, to perform the following procedure (s) Panretinal Photocoagulation for Treatment of Rubeosis and Neovascular Glaucoma _____ eye.
2. Dr. Mann has discussed with me the procedure(s) listed above and the items of information that are briefly summarized below:
 - a. The nature and purpose of the proposed procedure(s): Panretinal photocoagulation attempts to arrests the progression of abnormal blood vessels (rubeosis) which potentially can block he drainage angle.
 - b. The risks and possible consequences of the proposed procedure(s), including the risk that treatment may not accomplish the desired objective(s) and including, but not limited to: Glare and light sensitivity, ocular irritation, decreased peripheral vision with narrowed visual field, decreased accommodation, decreased dark adaptation, choroidal neovascularization, retinal breaks or detachment, hemorrhage, inflammation, acute intraocular pressure rise, corneal abrasion or laser burns, cataract, loss of vision, or need for further surgery.
 - c. All reasonable alternative treatment, including risks, probable effectiveness of each and consequences if this proposed treatment is not received: alternative treatment: panretinal cryotherapy
3. I am aware that, in addition to the risk specifically described in Item 2 above, there are other risks, such as severe loss of blood, infection, cardiopulmonary arrest, respiratory difficulties, injury to proximate/adjacent blood vessels, nerves, organs or structures, unanticipated allergic reaction to substances, pressure/position related injuries and other risks related to the performance of any surgical procedure.
4. I acknowledge that no guarantees have been made to me as to the results of the procedure(s) and am also aware that complications and risks may occur despite precautions.
5. I consent to the performance of unforeseen operation(s) and procedure(s) in addition to or different from those now contemplated and describe herein that the named doctor and his associates or assistants may deem necessary or advisable during the course of the presently authorized procedure(s).
6. I consent to the administration of such anesthetics as may be considered appropriate by the physician responsible for anesthesia administration or such assistants or associates as may be selected by him. I understand that this procedure is to be performed using **retrobulbar/topical** anesthesia. I understand that all types of anesthesia involve some risk. I further understand that if a regional, spinal or epidural anesthesia is planned, it may be necessary to also administer a general anesthetic. I understand that the risk of a general, spinal, epidural or regional anesthesia include, but are not limited to, mouth and/or throat pain or injury, cardiopulmonary arrest, cardiac arrhythmias, heart attack,

respiratory difficulties, stroke, brain damage, headache, backache and other sensory, nerve, focal and systemic injuries.

7. I also consent to the administration of blood or blood components, drugs, medicines and other substances considered advisable by the physician(s) responsible for this procedure and the use of x-rays or other diagnostic testing, procedures and devices, which the above-named physician or his associates, consultants or assistants may consider useful.
8. I hereby authorize The Retina Group Ltd, Dr. Eric Mann or staff to preserve for scientific or teaching purposes or to otherwise dispose of any tissues, parts, organs, or implants removed during this procedure.
9. For teaching or educational purposes, I consent to the admittance of students, staff or other observers to the operating and procedure rooms, and to the taking of any videos or photographs deemed appropriate or necessary by the physician in the course of the procedure(s). I also consent to the taking of photographs or videos for the purpose of documenting the condition or procedure in the medical record. I understand that if data, photographs, videos or other information are used for teaching/educational purposes or for scientific publication, that my (the patient's) identity will remain confidential unless otherwise authorized by the undersigned.
10. I certify that I have read or have had the above information read to me and that I understand the above consent to operation or diagnostic procedure, that the explanations referred to were made to my satisfaction and I hereby give my informed and voluntary consent to the proposed procedure(s) or operation(s).

Signature of patient:

If the patient is unable to give informed consent because of physical or mental incapacity or mental incapacity or is a minor (under 18 and unemancipated), complete the following:
Patient is unable to give consent because _____

:

Witness to signature

I certify that I have explained to the above individual the nature, purpose, risk and potential benefits of the above procedure and have answered any questions that have been raised.

Signature of Physician