

FOCAL LASER TREATMENT FOR CHOROIDAL NEOVASCULAR MEMBRANE

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INTRODUCTION

Choroidal neovascular membrane (CNM) involves the growth of abnormal blood vessels under the retina. The blood vessels are usually located close to or under the macula (reading center). Leakage of fluid and blood from the blood vessels can lead to significant visual loss, distorted vision, and blurred vision. CNM can undergo rapid growth. When it extends under the reading center it can cause irreversible visual damage.

The Macular Photocoagulation Study (MPS) established the benefit of laser treatment for certain types of CNM's. CNM can be associated with a number of conditions: macular degeneration (deterioration of the reading center due to aging), histoplasmosis (allergic spots in the eye due to fungus), myopic degeneration (deterioration of the reading center due to near-sightedness), trauma, etc.

1. **Extrafoveal CNM:** this type of vascular growth is at least 200 microns away from the center of the macula (reading center). An 18 month follow-up of patients in the MPS showed that 60% of untreated eyes vs. 25% of treated eyes with macular degeneration experienced severe visual loss. Similarly, 34.2% of untreated eyes vs. 9.4% of treated eyes with CNM's associated with Histoplasmosis (allergic spots on the eye due to fungus) lost six or more lines of visual acuity from the baseline level.
2. **Juxtafoveal CNM's:** these CNM's lie between 1 to 199 microns from the center of the macula (reading center). The juxtafoveal study (Krypton) demonstrated the benefit of laser for CNM's associated with Histoplasmosis (24.8% of untreated eyes, in contrast with 6.6% of treated eyes, had lost 6 or more lines of visual acuity at one year after treatment). CNM's associated with macular degeneration showed limited benefit from the laser treatment: 58% of untreated eyes vs. 49% of treated eyes had lost 6 or more lines of visual acuity at 3 years after treatment. The average visual acuity for both groups (treated and untreated) was very close to 20/200 at 3 years later. Laser was more beneficial for

those patients without significant hypertension (high blood pressure). Persistence and recurrence of the CNM were very common after laser treatment (32% and 47% respectively).

3. Subfoveal CNM's: these CNM's lie directly under the macula (reading center). Currently, a study addressing the benefit of treatment for subfoveal CNM's is still proceeding. Since subfoveal CNM's involve the reading center, the rationale for treatment is not so much visual improvement, but rather limitation of the size of the central blind spot.

INDICATIONS FOR TREATMENT

The MPS strongly recommends treatment of extrafoveal CNM's. The Krypton study also recommends treatment of juxtafoveal CNM's associated with Histoplasmosis. The indications for treatment of the other types of juxtafoveal CNM's must be determined on a case-by-case basis. Similarly, the treatment of subfoveal CNM is determined on a case-by-case basis. Since the treatment of juxtafoveal and subfoveal neovascular membranes in most cases have somewhat uncertain prognosis, laser is performed only if the patient expresses a strong desire to the physician for treatment.

METHOD OF TREATMENT

The laser beam is delivered on the retina through a temporary contact lens. The laser beam is focused on the CNM in order to focally "cauterize" or "seal" the vessels. Choosing a specific laser wavelength (color) is a very important feature of the treatment process. A certain wavelength may provide a superior result than the rest, depending on the absorption characteristics of the area of treatment. Either placement of eye drops or retrobulbar injection (placing anesthetics behind the eye) is used for pain control. The latter method also allows for immobilization of the eye. A fluorescein angiogram is usually obtained before treatment (see separate explanation). It serves as a guide for treatment. Fluorescein angiography is repeated at least once at 1-3 weeks after treatment.

BENEFITS AND LIMITATIONS

Laser treatment of CNM's is an attempt to arrest the growth and leakage from these abnormal blood vessels, thus leading to visual preservation. However, it is not "foolproof". Certain CNM's will continue to grow or not respond to treatment. The closer the CNM is to the reading center, the more likely it is for a certain amount of "heat spread" from the laser to affect the reading center in a negative way. Successful treatment can lead to visual improvement. However, in some cases vision can be the same or worse even if the CNM is controlled.

RISKS AND COMPLICATIONS

The following are common risks & complications:

- a. Scotoma (blurred spot) corresponding to the area where laser was placed.
- b. Glare and sensitivity to light, usually temporary in nature.
- c. "Flashing light" may persist for a period of time.
- d. Slight difficulty in coordinating the use of both eyes together: usually temporary phenomenon. Occasionally, different image sizes and diplopia (double vision) may be present, but usually improves with time.

The following are much less common:

- a. Hemorrhage (bleeding).
- b. Retinal hole
- c. Dramatic visual deterioration

Other potential complications and risks not listed here may be discussed by the doctor.

RECURRENCE

Although laser can arrest the progress of CNM's, there is a possibility of recurrence (return) of the vascular growth. Certain CNM's undergo regrowth after a period following laser treatment. Some recent series showed a figure as high as 50% recurrent rate (return) on some CNM's. Re-treatment by laser is, therefore, necessary in some cases. Sometimes further treatment may not be beneficial.

POST-TREATMENT COURSE

Severe straining, stress, and aspirin products should be avoided for the initial period after treatment until the doctor says otherwise. If retrobulbar anesthesia is used the eye is patched with ointment for 6-12 hours after treatment.

ALTERNATIVES

There are no proven alternative treatments for CNM's. The use of steroids for CNM's associated with Histoplasmosis was attempted in the past with mixed results.

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.

INFORMED CONSENT

I, _____ have been given the

brochure(s): FOCAL LASER TREATMENT FOR CHOROIDAL
NEOVASCULAR MEMBRANE & 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

Date

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

**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**

PROCEDURE NOTE

Patient: _____ Date: _____

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

Procedure: Focal laser _____ eye

Indications: Choroidal neovascular membrane _____ eye

Va OD _____ OS _____

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 laser treatment is performed not to improve vision but to hopefully stabilize vision and prevent further visual loss. The patient stated they had a good understanding of their 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, 3cc of 2% lidocaine was injected into the retrobulbar space using #25 gauge needle and a 10cc syringe. Adequate anesthesia and akinesia was obtained. Following treatment, the eye was patched for 24 hours.

Under fluorescein guidance with a _____ lens and the argon green laser, focal laser ablation of the choroidal neovascular complex was performed to achieve grade 3 intensity, white confluent burns which covered the entire extent of the SRNVM. Laser parameters and pattern are below. Laser treatment was performed without complication. The patient tolerated the procedure well and left the laser suite in good condition. Post-operative photographs were requested.

Parameters: 0.2 – 0.5 sec, 200 – 500 microns, _____mW, & _____total spots.

Post-operative care & management: This patient was instructed to return in follow-up in _____ or immediately upon any decreased vision, pain, Amsler grid changes, or symptoms of RD or RB (which were reviewed). Specific post-operative instructions included no ASA, HOB elevated and restricted activities with no physical exertion.

CONSENT SPECIAL/INFORMED TO SURGERY OR OTHER PROCEDURE

Name: _____

Date: _____

Medical record number /SS# _____

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)
**FOCAL LASER TREATMENT FOR CHOROIDAL NEOVASCULAR
MEMBRANE 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): **LASER TREATMENT IS AN ATTEMPT TO ARREST THE GROWTH AND LEAKAGE FROM ABNORMAL BLOOD VESSELS.**
 - 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: scotoma, glare and light sensitivity, flashing lights, hemorrhage, retinal hole, dramatic visual deterioration, loss of vision, 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: there are no proven alternative treatments for CNM's.

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