

PNEUMATIC RETINOPEXY
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A. Retinal Detachment

You have been diagnosed to have a retinal detachment which requires surgical repair. The retina is the nerve tissue membrane that lines the inner back wall of the eye. It is responsible for receiving visual images focused on it by the lens (Fig. 1).

Normal Eye

It is comparable to the film in a camera. Most retinal detachments are caused by one or more tears or holes in the retina. (Fig. 2).

Detached Retina

These tears or holes can be caused by shrinkage of the vitreous body, or retinal degeneration due to normal aging. The vitreous body is the transparent jelly-like substance that fills the chamber in front of the retina. Once the retinal tear(s) or hole(s) develop, watery fluid from the vitreous may be able to enter the space under the retina, thus separating the retina from the back wall of the eye (Fig 3).

Retinal Tear (Hole)

By definition, this is a retinal detachment. Once the retina is detached, it is deprived of adequate nourishment and will start to undergo damage. Since the retina is a nerve tissue the damaged part may not regenerate. Therefore, surgical intervention is indicated within a reasonable period of time. Retinal surgery is a priority surgery. It is NOT an elective procedure like cataract extraction. Without surgery blindness is almost a guarantee.

The following are frequent symptoms associated with a retinal detachment:

- a. Floaters
- b. Flashing lights
- c. Wavy or distorted vision
- d. Dark shadows
- e. “Cobwebs”

B. Pneumatic Retinopexy

This is a procedure designed to repair the retinal detachment by “plugging” the retinal hole(s) by a gas bubble which is injected into the eye. Cryopexy (freezing treatment) or laser is then used to seal the hole(s) in place. Several years ago, a study was performed comparing pneumatic retinopexy with conventional scleral buckling. Two hundred eyes were enrolled in the study. Half were treated with pneumatic retinopexy, and the other half with conventional scleral buckling. The results of the study showed that pneumatic retinopexy does not expose the eye to any greater risk than conventional scleral buckling. Not all retinal detachments can be repaired by pneumatic retinopexy. Some will respond better than others. However, there is no question that pneumatic retinopexy is a valid procedure for certain types of retinal detachments. Over the last several years, approximately 1200 patients undergoing pneumatic retinopexy have been reported (many more were done). Most of these studies indicate very similar and favorable success rates. The gases that are used in pneumatic retinopexy have been utilized for eye surgery for over a decade. These gases have been approved by the FDA (Food and Drug Administration). Over 20,000 gas injections associated with eye surgery have been made in the past.

Pneumatic retinopexy relies on the patient’s ability to cooperate primarily by maintaining a specified head and body position for 16 hours a day for at least 5 days. The procedure works because the gas bubble closes the retinal break(s)—hole(s) or tear(s) for a long enough time to permit the retina to be sealed by laser or cryopexy (freezing). If the bubble is not placed in the correct position, the operation will fail. Therefore, it is important for the patient to follow specific instructions.

The following is a list of the advantages of pneumatic retinopexy: a) no hospitalization b) no general anesthesia c) less trauma to the eye and less chance of internal bleeding d) no sutures or synthetic materials are needed.

C. Visual Prognosis

Prediction of vision after surgery cannot be certain. The visual recovery is much slower than after cataract surgery. It takes a minimum of 2 to 6 months (sometimes longer) before maximal visual recovery is achieved. Further gradual visual improvement may continue for as long as one to two years. The prescription glasses may also need to be changed in some cases. Final visual results cannot be guaranteed. If the macula (reading center) is involved by the detachment, there is a chance that the visual recovery may be slower and sometimes incomplete. An exact prediction of the final vision is not possible.

D. Risks and Complications

Similar to any other surgeries, certain potential risks and complications are associated with pneumatic retinopathy.

- 1) Anesthetic or systemic complications: Major disabling systemic or life threatening complications are rare, since this procedure is performed under local anesthesia, and it takes only a short time. Patients without major diseases of the heart, lung, kidney, diabetes, high blood pressure, neurological disease, bleeding disorder, and other major illnesses are at an even lower risk. Complications associated with the local anesthesia are minimal. Occasionally, retrobulbar/peribulbar anesthesia is used (detailed discussion found on another handout).
- 2) Recurrent or new retinal detachment or break(s): Even if the procedure is performed in a perfect manner, the retina may develop more break(s) or recurrent detachment. Sometimes scar tissue may form, causing interference with the reading center, or leading to recurrent retinal detachment. More surgery may be necessary. The greatest chance of recurrent retinal detachment is within the first 6 months after surgery.
- 3) Infection: This is a rare complication; severe internal infection which is sight-threatening is fortunately uncommon.
- 4) Bleeding: Minor bleeding on the surface of the eye usually resolves after a short period of time and does not have any permanent effect. Minor internal bleeding is rare. Major internal bleeding leading to significant visual damage is even more rare.
- 5) Pressure rise: Expansion of the gas in the eye leading to pressure rise and closure of blood supply to the eye is a potential complication that can be sight-threatening. The greatest risk is within the first 6 to 24 hours after surgery. The eye pressure is usually monitored carefully after surgery to decrease the chance of such an occurrence. Various maneuver and medications may be used to control the eye pressure after surgery.
- 6) Cataract: Clouding of the lens may develop or increase after surgery on an occasional basis.
- 7) Trapping of gas bubbles under the retina or at the front of the eye may develop on an occasional basis. The gas bubbles dissipate on a spontaneous basis. Sometimes more surgery is needed to correct the problem.

- 8) Migration of subretinal fluid: Sometimes the fluid under the detached retina may move into another area which previously has not been involved by the detachment. This occurrence may or may not have a bearing on the final surgical and visual success. Sometimes more surgery is needed to correct the problem.
- 9) Residual pocket(s) of fluid may remain under the retina long after the surgery. The central vision is affected only if the fluid involves the reading center. They eventually dissipate.
- 10) Swelling of the reading center may develop in some cases. This may resolve on its own after a period of time. It may have a bearing on the central vision (reading vision).
- 11) Minor cosmetic disturbance of the eyelid and surface tissue of the eye is usually temporary.
- 12) Although some of the complications listed above can be sight threatening, they are relatively uncommon. This is a comprehensive list but is not meant to be all-inclusive. Other potential complications and risks not listed are possible and may be discussed. Disabling systemic or life-threatening complication is rare but cannot be ruled out in a few cases.

E. Alternatives

- 1) Scleral buckling: This procedure is usually performed in the hospital. It may require general anesthesia. It lasts longer than pneumatic retinopexy. Synthetic silicone materials are used to close the retinal break(s). Sutures are used to close the wound. Cryotherapy (freezing) or laser is used to seal down the retinal break(s). The fluid under the detached retina is usually drained. (Separate handout discusses this procedure in detail).
- 2) Vitrectomy: The jelly-like fluid between the lens and the retina is removed. The fluid under the detached retina is drained by an internal approach. (Separate handout describes this procedure in detail).

F. To do:

- 1) Keep head and body in the position specified by doctor
- 2) Keep patch on operated eye for 1 week
- 3) You may watch TV
- 4) You may take baths without wetting the operated eye
- 5) You may shave, but use a razor blade
- 6) CALL IMMEDIATELY IF: Dramatic loss of ability to see light with the operated eye, severe nausea, or excruciating pain of the surgical eye, or severe headache (much more than before) occurs

G. Do Not:

- 1) No jerking movement of the head or body
- 2) No wetting of the operated eye for 1 month
- 3) No exertion, heavy lifting for 3 weeks
- 4) No sports for 3 weeks
- 5) No reading for 3 weeks
- 6) No sex for 3 weeks
- 7) Avoid electric shavers on face
- 8) Avoid knitting or card playing for 3 weeks
- 9) Do not go above 4000 feet; no flying

H. Specific instructions:

- 1) Head position: _____
- 2) Body position: _____
- 3) Take the following medications: a) _____
b) _____
c) _____
d) _____
- 4) Return visit to office on: _____

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)
PNEUMATIC RETINOPEXY & 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 with 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

PNEUMATIC RETINOPEXY
PROCEDURE NOTE

PATIENT: _____

DOB: _____

DATE OF SERVICE: _____

PNEUMATIC RETINOPEXY _____ **EYE**

INDICATION FOR SURGERY: _____

PROCEDURE: The patient was brought into the treatment room and placed in the supine position and a drop of Alcaine was placed in the operative eye. A retrobulbar block was performed in a standard fashion using a one-to-one mixture of 2% Lidocaine and 0.75% Marcaine injecting approximately 2.0 cc into the intraconal space of the operative eye. Complete akinesia and anesthesia was obtained. Indirect ophthalmoscopy confirmed the absence of any inadvertent globe perforation or artery occlusion with fundus exam unchanged from that documented prior to the block. A speculum was placed in the operative eye and cryotherapy was then carried out under indirect ophthalmoscopy well surrounding all retinal tears, holes, dialyses, and lattice degeneration in the affected eye and extending this treatment to the ora serrata. The patient tolerated the cryotherapy well. Drops of quinolone antibiotic (*Ciloxan Oxycillin, Vigamox*) had been placed in the eye every five minutes times four and immediately prior to preparation and draping of the affected operative eye. A standard prep and drape was performed to the operative eye with 10% Betadyne to external surface and 5% Betadyne as conjunctival rinse. A speculum was placed sterily in the operative eye. A mark on the external sclera was chosen 3.75 mm posterior to the limbus with a caliper. Using 100% gas (*C3F8/SF6*) was injected through the pars plana 3.75 mm posterior to the limbus under direct visualization using a 3cc syringe and a 30 gauge needle under direct visualization with the indirect ophthalmoscope. A total volume of (*0.3 cc/0.5 cc*) gas was injected without complication. A single gas bubble was formed or induced by mildly tapping the globe with a Q-tip that was performed without complication. A drop of antibiotic was placed in the surgical eye and intraocular pressure was measured with the Tonopen. The Tonopen intraocular pressure was measured at (*mm of Hg*) and direct ophthalmoscopy confirmed the central retinal artery to be (*patent, winking, closed*). A paracentesis (*was, was not*) performed in a standard fashion using a 30 gauge needle on a TB syringe at the slit lamp under direct visualization entering parallel to the iris at the limbus aspirating aqueous from the anterior chamber. A post-paracentesis intraocular pressure was found to be (*mm of Hg*). Antibiotic drops were placed in the eye every five minutes times four until twenty minutes following the procedure at which time a second post-operative pressure measurement was obtained and found to be (*mm of Hg*). The patient was instructed once again to maintain post-operative positioning for five to seven days following the surgery. Restrictions of no air or mountain travel or non-ocular surgery were emphasized once again. A pressure patch/pad was placed over the operative eye. The patient left the treatment room in excellent condition. **The patient was instructed to return the next day for follow-up appointment. The patient was to initiate post-operative medications immediately including Pred Forte QID for four days, Ispoto Hyoscine BID for four days, and Vigamox QID as instructed. A post-operative instruction sheet of eye care following surgery as well as a schedule of topical and systemic medications was given to the patient.**

The Retina Group LTD. P.C.

Eric S. Mann, M.D., Ph.D.

Diseases & Surgery of the
Retina Macula & Vitreous

POSTOPERATIVE INSTRUCTIONS FOLLOWING EYE SURGERY

ACTIVITY:

Avoid driving, bending, heavy lifting, vigorous coughing and/or sneezing, straining with bowel movements, vomiting, and any other activity that increases intra-ocular pressure. No exercise or physical exertion for 4-6 weeks.

WOUND CARE:

1. Avoid squeezing eyelids shut or touching eye.
2. During the day, keep operated eye covered with eyeglasses or shield.
3. At night, always wear shield to prevent rubbing eye and causing injury.
4. Wear dark glasses if photosensitivity occurs.
5. Crusting on the eyelids may be removed with a **clean** washcloth run under warm tap water.
6. DO NOT PRESS ON THE EYE.
7. Call your surgeon if you develop any signs and symptoms of infection: eye pain, decreased vision, itchy/watery eyes or increased redness/swelling/discharge.
8. Wash your hands before giving eye drops.

SAFETY PRECAUTIONS:

1. To avoid falls and/or accidents, remove throw rugs, clutter, cords and furniture in walking paths.
2. Turn head fully to affected side to view objects.
3. Use up and down head movements to judge stairs and oncoming objects. MOVE SLOWLY.

POSITIONING:

_____NONE _____SIDE DOWN _____FACE DOWN _____SIT UP _____DAYS

1. Do not lay prone or flat on back if special positioning is necessary.
2. Maintain special positioning as much as possible, taking a 5 minute break every 120 minutes.
3. Do not ascend altitudes greater than 2000 feet; do not fly in an airplane; no non-ocular surgery unless both the surgeon and anesthesiologist know you have gas in your eye.

MEDICATIONS:

1. Avoid over-the-counter medications unless discussed with your doctor.
2. Shake eye drops before applying; shake Pred Forte 1% Eye Drops 30 times before using.
3. Avoid contaminating tip of eye drop applicator by touching eye with tip.
4. Wait three-five minutes between application of different eye drops.
5. Take Tylenol for pain.
6. Avoid aspirin, aspirin containing products such as Anacin and anticoagulants such as Heparin and Coumadin unless approved by your doctor.

FOLLOW UP CARE:

Follow up care is a critical part of a successful surgery. Your surgeon needs to assess your eye healing and see that you are recovering safely.

YOUR SCHEDULED FOLLOW UP APPOINTMENT IS :_____.

REPORTABLE SIGNS:

Call Dr. Mann immediately if any sudden eye pain not relieved by Tylenol, increased redness/swelling/discharge, or loss of vision or any systemic complaint.

EMERGENCY PHONE NUMBER TOLL FREE:	866-856-7882
OFFICE NUMBER MISSOURI:	314-835-9400
OFFICE NUMBER ILLINOIS:	618-632-8100

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

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)
PNEUMATIC RETINOPEXY _____ **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): **REPAIR THE RETINAL DETACHMENT BY PLUGGING THE RETINAL HOLE(S) BY A GAS BUBBLE, WHICH IS INJECTED INTO THE EYE. CRYO OR LASER IS THEN USED TO SEAL THE HOLES IN PLACE..**
 - 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: anesthetic or systemic complication, recurrent or new retinal detachment or breaks, infection, bleeding, pressure rise, 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 treatments include scleral buckling procedure or pars plana vitrectomy.

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 PC 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