Chapter 73
Repair of Retinal Detachment via Pars Plana Vitrectomy (C3F8/SF6/Oil)

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Abstract A confirmation of a rhegmatogenous retinal detachment should be made including identification of the causative breaks if possible. The patient should then undergo a thorough informed consent process including the need for an expedient repair and the risks involved with vitrectomy-based surgery.

Keywords Retinal detachment • Pars plana vitrectomy • Endolaser • Fluid-air exchange • Air-gas exchange • Air-silicon oil exchange • Drainage retinotomy • Internal drainage of subretinal fluid

Indications

Rhegmatogenous retinal detachment

Essential Steps

1. Topical anesthetic and dilating drops
2. Retrobulbar anesthesia
3. Sterilization of periocular and ocular surface
4. Sterile draping of microscope and patient
5. Opening of sterile drape with Westcott scissors, bisecting lid opening so drape can fold under and cover lid margins and lashes
6. Placement of sterile wire speculum
7. Placement of inferior temporal gauge trocar posterior to the limbus with anterior conjunctival displacement with cotton tip and 30° insertion angle
8. Vitrectomy
9. Identification of retinal tears
10. Surgical retinotomy
11. Drainage of subretinal fluid
12. Fluid-air exchange
13. Endophotocoagulation

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14. Placement of surface tension agent (*SF6*, *C3F8*, *silicone oil*)
15. Removal of cannulas while forcing scleral tunnel closed with smooth metal instrument
16. Broad-spectrum antibiotic and steroid subconjunctival injections
17. Speculum removal with patch and shield placement
18. Patient positioning as indicated by location of breaks and agent used in repair

Complications

– Ocular hypotony
– Ocular hypertension
– Endophthalmitis
– Proliferative vitreoretinopathy
– Suprachoroidal hemorrhage
– Sympathetic ophthalmia
– Iatrogenic lens damage
– Hyphema

Template Operative Dictation

Preoperative diagnosis: Rhegmatogenous retinal detachment (OS/OD)

Procedure: (1) Pars plana vitrectomy, (2) fluid-air exchange, (3) *air-gas exchange/air-silicon oil exchange*, and (4) endophotocoagulation

Postoperative diagnosis: *Same*

Indication: Patient is a ____-year-old *male/female* who has a macula *on/off* rhegmatogenous retinal detachment with break(s) located at ____ o'clock. After detailed informed consent process, including risks and benefits of the procedure, the patient elected to proceed with the surgery.

Complications: (list here if applicable, otherwise: none)

Description of the procedure: After verifying the correct surgical site, the patient was placed in supine position and taken to the operating room on an ophthalmologic gurney. The patient received a retrobulbar injection with a 1 ¼ in., 27 gauge needle consisting of *2 % lidocaine* through the infratemporal periocular tissues on a straight path into the muscle cone. This produced adequate akinesia and analgesia.

The eye was prepped and draped in the usual sterile fashion for ophthalmic surgery. The lid drape was then incised and a speculum was inserted to further expose the operative eye. A time-out procedure was then carried out in the standard fashion verifying operative eye and procedures to be performed. A measurement was made *3/3.5/4.0* millimeters from the limbus in the inferotemporal quadrant. A Bishops forceps was used to displace the conjunctiva, and a (*25/27*) gauge trocar was used to place a (*25/27)* gauge port in the vitreous cavity. The trocar was inserted at a 30°

insertion angle through the sclera with anterior conjunctival displacement using a cotton tip applicator to create a self-sealing scleral wound. The infusion cannula was placed through the inferotemporal port and confirmed to be inside the vitreous cavity by direct visualization using the operating microscope. Ports were also placed in the superotemporal and superonasal quadrants using the same technique.

With all three ports in place, the vitrectomy was begun by placing the endoilluminator into the superonasal cannula and the vitreous cutter into the superotemporal cannula. A macula (*involved/uninvolved*) (*quadrant or quadrants involved/total*) retinal detachment was noted. After removing all vitreous traction and vitreous and identifying any subretinal or epi-retinal proliferative vitreoretinopathy lesions, a switch to wide-angle visualization was made. The assistant surgeon then stabilized the wide-angle visualization lens on the eye, and a thorough inspection of the peripheral retina was performed (*if needed: including scleral depression in order to identify any peripheral untreated retinal breaks and other retinal pathology*). Retinal tears were found at ___ o'clock position(s), and a posterior drainage retinotomy was created with the vitreous cutter (*nasal/temporal/superior temporal/inferiortemporal/inferiornasal/superiornasal*) to the *nerve/arcades/macula* if the subretinal fluid could not be drained through a preexisting retinal break. The soft tip cannula was then positioned over the surgical drainage retinotomy site, and simultaneous internal drainage of subretinal fluid and fluid-air exchange were performed. Through this process, the retina was noted to be completely reattached. Endophotocoagulation was performed using a (*25/27*) gauge (*straight/flex tip*) laser probe in order to sufficiently surround the posterior drainage retinotomy site, as well as, all retinal breaks and other areas needing treatment. Following this, *air-gas exchange/air-silicon oil exchange* was performed using *an isoexpansile mixture of sulfur hexafluoride gas/silicone oil* leaving the eye at physiologic eye pressure.

The superotemporal and superonasal ports were removed. The sclerotomy sites were closed using manual pressure with closed forceps overlying the sclerotomy sites, while simultaneously removing the cannulae with a second pair of forceps. The port containing the infusion cannula was also removed and closed in the same manner. Subconjunctival injections of *25 mg of vancomycin*, *20 mg of tobramycin*, and *2 mg of Decadron* were given in the inferior fornix. The speculum was removed followed by the drapes. 5 % Betadine was applied to the ocular surface, followed by irrigation with sterile BSS. The periocular surface was then cleaned with a wet followed by dry 4×4s. The eye was then patched and shielded in the usual fashion following ophthalmic surgery. The patient left the operating room in stable condition and was transported to the postoperative holding area. The patient tolerated the procedure well (*with/without*) complications. Attending Dr._____ was present and scrubbed for the entire procedure. Dr. _____ was present and scrubbed for the surgery, assisted in the surgery, and assisted with important medical communications with the operating room staff.