

### Why and when do I need multiple procedures?

The multiple procedures like buckling and gas injection are done if the retina, vitreous and lens is also involved. In most cases, there is better than 80% chance of successfully reattaching the retina with one operation. But successful reattachment does not necessarily mean restored vision. The return of good after surgery depends on whether, and for how long, the macula was detached, vision rarely returns to normal.

Still, if the retina is successfully reattached, vision usually improves. The best vision may not occur for many months after surgery. In some cases, even if the macula was still attached before the surgery, and even if the surgery results in successful reattachment of the retina some vision may be lost. If the first retinal detachment operation fails, a second operation is possible.

### What is Silicone oil?

It is linear synthetic organo-inorganic polymer of dimethyl siloxane. It has the transparency and viscoelastic properties similar to vitreous hence it is used in vitreo retinal surgeries, to provide a long term or permanent internal tamponade. It may be necessary to remove the oil at a later stage if it leads to any complication.

### Indication for using silicon oil:

- Proliferative Vitreo Retinopathy
- Diabetic Retinal Detachment
- Giant Retinal Tear
- Traumatic Retinal Detachment

### Complication of silicon oil:

- Cataract
- Glaucoma
- Corneal changes

### What is PFCL?

- It is heavy liquid and has lighter density than water. So it sinks in water filled spaces.
- As soon as this liquid is injected, it helps in unfolding the retina, exactly like blooming of a flower.
- Used in complicated cases of Vitrectomy, where after vitrectomy these liquids sink into the posterior retina displacing the sub retinal fluid anteriorly thus attaching the retina.
- This liquid is a boon to the patients needing complicated retinal detachment surgeries.

### Indications of PFCL:-

1. Complicated retinal detachment
2. Giant retinal tear.

### What are the complications of the retinal detachment surgery?

Even though the surgery for retinal detachment is generally successful, certain complications can occur. Retinal detachment surgery done by scleral buckling can affect the eye muscles that move the eye and keep the eye straight. This can result in double vision which on rare occasions is permanent.

- Recurrent retinal detachment
- Bleeding under retina
- Cataract formation
- Glaucoma
- Proliferative vitreo retinopathy
- Vitreous hemorrhage

Although any one of these can result in a need for more surgery or loss of vision, these complications however are very infrequent.

### Should recurrent detachment be operated at the earliest?

- It is advisable to operate any of the complications at the earliest because waiting for a longer time may only
- Reduce the vision further.
  - Increase the complications further.
  - Reduce the chances of better recovery.

### What are the congenital (since birth) retinal diseases?

There are some congenital diseases like night blindness or retinitis pigmentosa, which affects whole of the retina or more of the peripheral retina. Macular degeneration like Stargardt's Disease, Heredomacular Degeneration and Macular Degeneration due to myopia are also some of the retinal congenital diseases.

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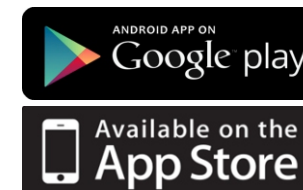
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In some cases if the detachment is not operated on time, a delay will produce complications and sometimes scleral buckling surgery fails because of the excessive scar tissue that grows on the retina.

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# RETINA & ITS COMPLICATIONS



### ADITYA JYOT EYE HOSPITAL PVT.LTD.

Plot No.153,Road No.9, Major Parmeshwaran Road, Wadala (West) ,Mumbai-400031 (India)  
Appointments: +91 9833500580.  
Tel.: 91-22-24177600/ 65102690/ 24177602.  
Fax: 91-22-24177654  
E-mail: appointments@adityajyoteyehospital.org  
Website: www.adityajyoteyehospital.org

## RETINA & COMPLICATIONS

### What is retina?

- Retina is the photosensitive or light sensitive layer of the eye.
- It has the consistency of a tissue paper i.e. it is very fine in nature.
- It forms the last innermost layer of the eyeball. The retina acts similar to the negative film in the camera.

### What are the parts of the retina?

PARTS	FUNCTION
1. Peripheral Retina	Night vision & Side Vision Appreciations of fine details of objects,
2. Macula (Central Retina)	

### What can go wrong in the retina?

You can have problems in the retina, which are congenital (i.e. right from the birth) or acquired. These are conditions, where either the full retina or the central part is involved.

### What are the common retinal disorders?

The common retinal disorders are as follows:

- Retinal Tear
- Retinal Hole
- Retinal Detachment
- Diabetic retinopathy-caused by long standing diabetes.

### What are the alarming symptoms of retinal tear & detachment?

- Floaters (Refer to myopia article for details)
- Flashes (lightening sensitive in eye)
- Sudden blurred vision
- An area of dark vision, like a curtain or a veil coming from above or below or from the sides. Actually lot of people see floaters & flashes time & again. But sometimes these symptoms could be sign of a tear or detachment.

### (Know about retinal tear & holes)

#### What are retinal holes/tears?

- Holes are small circular defect in the retina. Tears are due to flap of retina being pulled off the choroids as the vitreous shrinks.

#### Treatment:-

Retinal hole or tear may need cryo or laser.

#### What is the treatment for retinal holes/tear?

If you are diagnosed to have retinal hole or tear & if you vitreo retinal surgeon feels it could be potentially sight threatening, then he/she may advise you to under go either cryo therapy or laser therapy.

### What do you mean by laser & cryo therapy?

#### Laser therapy (Diathermy):-

In laser a beam of light is converted to heat when it hits the retina. This welds the retina to the choroid.

#### Cryo treatment:-

In cryo the cold probe freezes the tissue around the tear causing the retina and choroid to stick together.

### What is Pneumatic Retinopexy?

- Cryotherapy or laser treatment is done to seal the retinal tear.
- In pneumatic retinopexy gas is injected into the vitreous cavity to push back detached retina in to its place.
- The gas once injected in the vitreous cavity expands thereby pushing the retina towards the eye ball. Over a period of time, the gas gets absorbed. The period of absorption will depend upon the type of gas used.
- Depending on the severity of the break, the injection of the gas varies.
- SF<sub>6</sub> (Sulfurhexa Fluoride) expand four times its volume & lasts in the eye for about 1-2 week then gets absorbed.
- C<sub>3</sub>F<sub>8</sub> (Perfluro Propane) expands 2.6 times its volume & remains for about three to four weeks in the eye before getting absorbed.
- During the time the gas remains in the eye, travel by flight must be avoided because high altitudes can result in expansion of gas thereby leading to increased eye pressure. This can cause damage to the eye.

### Know about retina detachment

#### What is retinal detachment?

Separation of retina from the back wall of the eye is called retinal detachment.

#### Causes:

- Lattice degeneration (Weak spots in retina)
- Retinal hole or tear
- Injury
- Long term diabetes mellitus
- Myopia
- Spontaneous (without any obvious cause)

#### Who gets retinal detachment?

- Each year in United States, approximately one out of 10,000 people develop a retinal detachment.
- Certain people have a greater chance of getting retinal detachment than others; those with a high degree of high myopia, a family history of retinal detachment, or those who once had a retinal detachment in the other eye.

- Patient who have thinning of the retina (termed “lattice degeneration”) or other degenerative changes of the retina are also at increased risk.
- Patient who have had cataract surgery have about 1% to 2% chance of developing a retinal detachment
- A person in any of these high risk groups should have a thorough retinal examination regularly and should be seen immediately if they experience sudden flashing of lights, new floaters, or loss of peripheral vision.

### How dose Lattice with hole lead to Retinal Detachment?

Lattice with a hole, if not treated, can lead retinal detachment. When there is a tear in the retina, the liquid in the vitreous cavity, passes through the tear, gets under the retina, thus lifting it up from the back wall of the eye leading to retinal detachment.

Retinal Detachment needs to be operated at the earliest for better recovery, if

- It is fresh detachment (<2 days)
- It is in the upper half of the eye-threatening the center of the retina (macula)

### What is the treatment for retinal detachment?

Surgery is only possibility for treating retinal detachment.

### What surgery is usually done?

If the detachment is too large then it require advanced surgery of scleral buckling. If the patient reports and the detachment is treated at the earliest, then 80 patient out of 100 usually have well attached retina and do not require any re-surgery. Only remaining 20 patients might develop other complication which may require re-surgery.

### Scleral Buckling Procedure:

- Break (Tear or hole) is localized.
- Break is sealed by cryo/laser.
- The fluid from under the retina is drained out.
- Then a flexible silicon band is sewed onto the outside wall (sclera), around the eye. This pushes the sclera in towards the retinal tear or the detached retina.
- Thereafter gas is injected into the vitreous cavityhence pushing the detached retina against the buckle to keep the tear closed.
- Once a scleral buckle is sutured onto the wall (sclera) of the eye, it stays in position forever.
- It might slightly change the shape of the eye and after the eye has healed, a new pair of glasses may be necessary to correct the vision.

In some cases if the detachment is not operated on time, a delay will produce complications and sometimes scleral buckling surgery fails because of the excessive scar tissue that grows on the retina.

- This scar tissue is very bad for the eye as it pulls the retina causing it to redetach.
- The scar tissue can also wrinkle the retina, like a wrinkled aluminum foil.
- This condition is called Proliferative Vitreo Retinopathy (PVR). In such cases vitrectomy is performed.

### What is Vitrectomy?

- The vitreous is removed, therefore the name “Vitrectomy”. The lack of vitreous dose not affect the functioning of the eye
- During vitrectomy, good equipment is required and Aditya Jyot possesses the most sophisticated and automated vitrectomy equipment called-ACCURUS Technology and the latest from Constellation Vision System. This is first of its kind in Asia. The surgeon uses fiberoptic light to illuminate the inside of the eye and other instruments such as forceps and microscissors are used to do the surgery.
- The only way to unfold and reattach retina is to cut away the vitreous and remove the scar tissue with vitrectomy surgery. Removing the scar tissue from the surface of the retina is a very delicate process that requires the surgeon to lift and peel strands of the scar tissue away from the retina.
- The surgery may take many hours in several cases.
- After the vitreous and the fibrous & scar tissue are removed the eye is then filled with air- to push the retina back against the scleral buckle. The gas remains in the eye for a long time before it is naturally absorbed. Once the retina is in place, laser is used to seal the retinal tear. At this point, the surgeon may replace air with long standing gas that remains in the eye for many weeks. The vision is always poor when the air/gas is in the eye.
- The gas keeps the retina pushed up against the eye wall enough for the laser burns to heal and take hold.
- In some cases the same is achieved with silicon oil-this oil is usually removed at a later time.
- It is important to understand that the scar tissue may reform after surgery and cause re-detachment of the retina.
- The chances of successful retinal reattachment, with vitrectomy for PVR is about two out of three. The chance of regaining good enough vision just to get around 50%. Reading vision rarely returns.

It should be clearly understood that the purpose of the PVR surgery is to give the patient an eye that would have some vision and could serve as a “spare tyre” if the other eye ever loses vision entirely