Retinal Detachment
www.retinaconsultantssd.com

What is a retinal detachment?

If we think of the eye as a camera, light travels through the front of the eye, called the cornea, past the pupil (an opening in the colored part of the eye called the iris) and is focused by your normal lens (when it gets cloudy it is called a cataract) onto the retina where the picture or video is taken (like the film in the camera). Now, if we think of the eye as a basketball filled with fluid/jelly like material, the inner rubber lining of the basketball (the retina) has a tear or tears and the fluid once in the middle of the eye now passes through the tear, lifting the inner rubber lining, separating it from the back wall of the eye now away from part of its blood supply. It must be put back in place so its blood supply can be restored.

How is it fixed?

If the detachment is very limited, laser can sometimes be used to ‘wall off’ the detachment but this will result in permanent loss of some visual field so it is restricted to relatively ‘small’ detachments. There are basically three surgical ways to reattach the significantly detached retina, a scleral buckle, pneumatic retinopexy, or vitrectomy. Sometimes these procedures are combined. A scleral buckle works
by pushing the outside wall of the basketball towards the separated lining, pneumatic retinopexy uses a small gas bubble inserted inside the eye to push the lining back into place, and vitrectomy removes the jelly and inserts a large gas bubble to push the retina in place. Once in place the retina is ‘glued or welded’ with either laser treatment or cryopexy. Each operation has about the same overall success rate, about 80-90% with one operation (depending on your specific detachment and eye) and a 99% final overall anatomic success rate. Before or sometimes during the operation your surgeon may decide to combine the procedures and, for example start with a scleral buckle and then add a vitrectomy.

When the retina is re-attached vision usually improves, with more than 50% of eyes attaining reading vision (20/40) but sometimes vision does not improve, regardless of the type of operation, used because the retina is permanently damaged while it is separated from its blood supply. In such cases vision cannot be improved with glasses because the ‘film,’ in the camera is defective. Each operation has advantages and disadvantages and no one operation fits all conditions. Each operation carries the risk of bleeding, infection and failure to reattach the retina. There are also risks of anesthesia, which are very rare but include stroke and even death.

What are the advantages, disadvantages and alternatives of each procedure?

Surgery must be performed for a retinal detachment or all sight will usually be lost. If surgery is not performed, the eye may become blind, painful, shrink and have to be removed. The only alternatives are laser alone (for limited detachments only), Pneumatic Retinopexy, Scleral Buckling, and Vitrectomy.

**Pneumatic Retinopexy** is usually performed in the office. The tears are treated with cryopexy if not severely elevated, a gas bubble is inserted, and a small amount of fluid is removed from the front of the eye to accommodate the volume of the injected bubble. The patient is positioned so the bubble covers the elevated break(s). The fluid usually resolves in a few days and sometimes laser is applied to
weak areas or to try to prevent new tears from developing in other areas of the retina. Unless you are comfortable standing on your head, pneumatic retinopexy is limited to detachments with breaks in the upper retina only. The risks of pneumatic retinopexy are hemorrhage, infection, and failure to re-attach. Usually floaters resolve but may persist. Sometimes new breaks develop which may or may not be related to the procedure. If the operation is not successful after 3-5 days, usually a vitrectomy is performed. If done properly and promptly, a failed pneumatic does not disadvantage your eye to ultimate attachment or better vision. The single operation success rate has been reported about 5-10% lower than scleral buckling but pneumatic retinopexy does not involve any treatment in an operating room and is usually performed in the office, carries almost no anesthesia risk, and if done properly and re operated promptly, results are excellent. In our opinion a single operation pneumatic gives the best final vision and restores the eye to its normal shape but cannot be performed on all cases due to the location of the break or breaks.

Scleral Buckling has been performed since the 1950’s and is a time proven successful way to reattach the retina. It is performed initially in an operating room, under local or general anesthesia, and is usually an out patient procedure. The main disadvantage of scleral buckling is that the buckle itself may result in double vision because it may affect how the muscles move the eye, and may induce astigmatism.
and/or make the eye more nearsighted. In 5-10% of eyes, the buckling material becomes infected and has to be removed or is irritating and causes discomfort and tearing. In most cases the buckle remains in place for life. In some cases, the patient asks to have the buckle removed, usually for reasons of discomfort or double vision. If the buckle has been in place for more than 3 to 6 months there may be scar tissue about the muscles from the buckle and even when the buckle is removed, some degree of double vision may persist which can be treated, if not severe with prism in a pair of glasses. Floaters usually resolve, but can persist.

These long-term complications of the buckle are avoidable if the
buckle is removed 3-4 weeks after its insertion. We have removed the buckling material occasionally but intentionally after 3-4 weeks, and sometimes 3-5 days (when we used then Lincoff Balloon which is no longer available) to avoid most of the side effects of the scleral buckle. This usually means another trip to the operating room.

What’s new in scleral buckling?

Note: This is an investigational technique using a newly designed scleral buckle we are developing, which may or may not fit your needs.

Over the last 20 years we have learned that a permanent buckle, in most cases is not necessary and have designed a removable buckle made with more modern materials and manufacturing techniques, with a unique design that does not require significant dissection to remove. Thus a second trip to the OR to remove the buckle may not be necessary for the dissection is minimal. The exopant is initially sutured to the globe with dissolvable sutures, which resorb in 2-3 weeks so there is no need to perform deep dissection to remove the suture material. The buckle is designed with a ‘wing’, which is grasped in a more anterior accessible area so it can be easily grasped and removed with a small incision, possibly in the office. The risk of removal outside the OR in a ‘clean room’ theoretically could increase the infection rate. If we decide to remove the buckle out side the operating room, we would advise pre and post operative antibiotic drops taken 4x per day for 5 days before and after the procedure. Even though scleral buckling is 50 years old and we use the exact same surgical techniques we would use with a conventional permanent buckle, we must still prove that the results are as good (and we believe will be better) than the conventional buckling operation where the buckle is inserted for life with all the previously mentioned buckle related side effects. If you are interested in more information please speak with your doctor.

What is Vitrectomy and when is it considered?
The middle of the eye contains vitreous, a clear gel when you are born which liquefies and breaks up into ‘clumps’ as you age. In the case of retinal detachment, the vitreous is the ‘villain’ and the retina is the ‘innocent bystander’. The vitreous is attached to the retina at the optic nerve, in the macula, along vessels and in the periphery. The vitreous normally separates with age, first from the optic nerve (which will give symptoms of a floater, and in the periphery, which may give symptoms of brief (seconds) flashing lights. As the vitreous separates, in a small percentage of people, the vitreous pulls a piece of retina with it, causing a retinal tear. More than one tear can develop. The liquid vitreous in the middle of the eye now can percolate through the torn retina and dissect beneath the retina, lifting the retina away from the back wall of the eye. This is a detached retina. If the tears are caught early, before the retina detaches, they can be repaired with laser. If a small amount of fluid collects about the tear, a laser barricade can be used to wall off the detachment and prevent its extension. This is done in the office, is painless and takes little time to do. It takes about 2.5 weeks for the laser marks to heal, as it becomes a ‘spot weld’ holding the retina in position.

Vitrectomy is considered for a retinal detachment when the vitreous exerts significant traction on the retina or is associated with severe floaters, which limits the surgeon’s ability to examine the retina, and is very bothersome to the patient. The debris may be pigment, blood or aging vitreous collagen. Sometimes the retinal tears may be in locations not amenable to a scleral buckle (far back in the retina) or a pneumatic procedure (inferior breaks). Some surgeons prefer
vitrectomy for all cases of retinal detachment, accepting the inevitable side effect of cataract development. The vitreous is removed using ‘space age technology’ which has evolved and been greatly refined since it was first developed in the late 1970’s. There are usually three instruments inserted into the sides of the eye, very close to where the colored part of the eye (iris) meets the white part of the eye (sclera), called the pars plana. The instruments are inserted through preplaced cannulas and are less than one mm in diameter, so small that suturing the wound used to insert the instrument/cannula may not be necessary. In general, one instrument infuses a saline solution; one provides light or lighted instruments, and another cuts and gently aspirates the vitreous out of the eye. The saline solution infused into the eye is replaced in less than 24 hours with the body’s naturally formed liquid fluid; the vitreous does not ‘grow back’. During fetal development the vitreous is very important, after birth it may protect the lens from oxidation (cataract formation) but otherwise is not needed and just causes problems. Other instruments may be used such as laser probes, aspiration devices, and forceps. Sometimes a colored dye is necessary to enable the surgeon to better identify pathology. These dyes are called ICG, Brilliant Blue, and Kenalog (Kenalog is not really a dye but Kenalog shows vitreous attachments to the retina). Sometimes the surgery is combined with a scleral buckle, which is a silicone band encircled about the eye and is usually used if there is a complex retinal detachment. In very complex cases silicone oil is inserted into the eye, which usually requires removal about three months after it is inserted. Experienced retina surgeons may also use ‘heavy liquids’ to attach the retina. These are all tricks of the trade and are used as the case progresses. Although the doctor will always try to inform you what will be done, it is not always possible to predict exactly what will be needed to give the eye the best chances to regain sight. Although we always have a ‘game plan’ it is not always possible to determine beforehand exactly what will be needed during the operation. The main ‘side effect’ of vitrectomy is cataract formation. If you are over 50, the chances are 80-90% a cataract will develop, usually within 2 years but sometimes more quickly. Vitrectomy also carries the risk of hemorrhage, bleeding, infection and failure to re-attach the retina. It is done in an operating room under local or general anesthesia as an outpatient.
Regardless of the operation used, there are risks of anesthesia, and risks of bleeding, infection, or a vascular occlusion. Even with one operation successful surgery your vision may not return to its pre-detachment level. Although we believe that removing the buckle will prevent some or all of the side effects of a permanent buckle, no guarantees can be made. However, without surgery you will lose all sight in the eye, and sometimes the eye shrinks, becomes painful and has to be removed. You must also understand that the return of vision can be slow. We generally tell patients that about 80% of what will return will do so between 6 and 12 weeks, 90% should return by one year and after 2 years, 100% of what will return has done so.

More information can be obtained on the Internet and we suggest the American Academy of Ophthalmology web site for more information about retinal detachments at AAO.org.