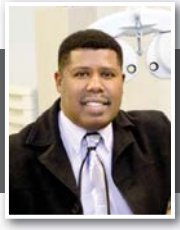
RETINAL DETACHMENT TREATMENT REVISITED



It is not uncommon to find the busy practitioner and student overwhelmed by research publications. *Vision*, in each edition will present summaries of certain clinical research topics highlighting some of the most salient points. This will aid clinicians and students to keep in touch with the latest developments in eye care and related fields.

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INTRODUCTION

Retinal detachment (RD) is a misnomer and occurs when the neurosensory layer and retinal pigment epithelium separate rather than the detachment of the choroid from the retina.[1] If untreated, retinal detachment can cause devastating damage to the vision. Therefore, retinal detachment is considered an ocular emergency that requires immediate attention.

TYPES OF RETINAL DETACHMENTS

There are three types of retinal detachments, namely rhegmatogenous RD, tractional RD and exudative RD. Some retinal changes that may pose a threat to vision include vitreoretinal traction tufts, meridional folds, degenerative retinoschisis, lattice degeneration, snail-track degeneration, atrophic retinal holes and operculated retinal holes and breaks.[2]

Rhegmatogenous retinal detachment occurs due to a retinal break or tear in the sensory layer of the retina that allows the liquid vitreous to pass through the break and detach the retina.[2,3] This is the most common type of detachment and the people most at risk for this type of detachment include high myopes, patients who have undergone eye surgery or serious eye injury. It is important to remember that a LASIK patient who previously was a high myope is still a high-risk patient for rhegmatogenous retinal detachment. High myopes are more susceptible because the eyes are longer than normal, causing the retina to be thinner and more fragile.

Figure 1. Bullous, rhegmatogenous retinal detachment. The detached retina has an opaque and corrugated appearance due to intraretinal oedema. The blood vessels appear darker in the detached (convex) area compared to the flat retina. When the retina detaches, it separates from its blood supply and source of nutrition. The retina will degenerate and lose its ability to function if it remains detached.

Exudative retinal detachment occurs due to a leakage from under the retina, which detaches the retina. They are caused by subretinal disorders, which damage the RPE and thereby allow the passage of fluid derived from the choroid into the subretinal space.[1,3] A more correct description would therefore be "transudative".[3] Tumours, connective tissue disorders, macula degenerative conditions and inflammatory disorders can create exudative detachments. Vogt-Kayanagi-Harada syndrome, uveal effusion syndrome and Coat's disease are examples of exudative retinal detachment.[4]The evaluation of an exudative detachment will consist of dilated fundus exam, angiography, ultrasonography and a complete medical work-up.[4,5,6]

Tractional retinal detachments arise due to pulling on the retina from fibrovascular tissue within the vitreous cavity. Proliferative diabetic retinopathy is a common cause of tractional retinal detachments. Three main types of vitreoretinal traction are recognised:[3]

- Bridging traction due to contraction of fibrovascular membranes that stretch from a part of the retina posterior to the equator to another.
- Tangential traction is caused by contraction of epiretinal fibrovascular membranes and may be responsible for puckering of the retina and distortion and avulsion of the retinal vessels.
- Anteroposterior traction is caused by the contraction of fibrovascular membranes, which extend from the posterior retina, usually from the major temporal arcades, towards the vitreous base.

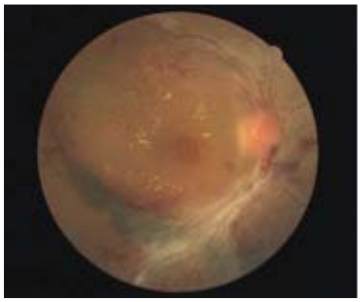


Figure 2. Proliferative diabetic retinopathy. Tractional retinal detachment is caused by a mechanism of progressive contraction of fibrovascular membranes over large areas of adhesion.

SIGNS AND SYMPTOMS OF RETINAL DETACHMENT

- Curtain or veil obstructing vision
- Sudden decrease in vision
- Light flashes
- Shower of floaters that resemble spots or bugs.

MANAGEMENT

Diagnostic Tests

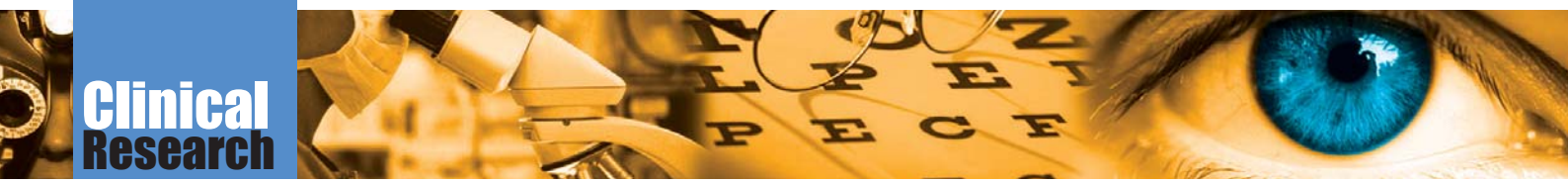
- Pinhole or best corrected VA
- Afferent pupil defect is possible if large detachment is present.[3,7]
- Confrontation fields- A shallow detachment might be difficult to detect for an inexperienced clinician when using the ophthalmoscope but will be evident on confrontation fields.[7]
- Slit-lamp biomicroscopy-Look for "tobacco dust"/Schaffer's sign in the vitreous.[3] In recalcitrant uveitis, remember to think of possible RD.
- DFE- Recline patient for extreme periphery assessment. Scleral depression can reveal flaps.2 To find holes, try looking at the top edge of the detached area and in pseudophakes, the hole is likely to be superior, or near the surgical wound.[2,3]
- B-scan ultrasound
- Automated visual fields-Quantitative and qualitative measurement of fields excellent for monitoring
- IOP- this is usually about 5mmHg lower than the normal fellow eye.[3,5]

Treatment

The treatment of retinal detachment depends on the type, severity and location of the retinal detachment as well as the preferred method of the retinologist.[3,4,6,7]

Scleral buckle

A scleral buckle is a procedure in which a tiny sponge or band made of silicone rubber is sewn onto the outside of the eye.[3,6] It is metaphorically called a buckle since it "buckles" or indents the wall of the eye. Some complications include IOP spike, diplopia, CME, ERM, infection, and recurrent RD. Also, expect a significant change in refraction (increased myopia) and prescribe accordingly. Post-operatively the patient is placed on steroids, so monitor IOP.



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Photocoagulation

The purpose of retinal photocoagulation in repairing retinal detachments is to stimulate a chorioretinal reaction thereby sealing retinal breaks.[1] Laser and Xenon arc sources are common photocoagulation methods.[3] Neuroepithelial necrosis can only be achieved by photocoagulation if the retinal pigment epithelium and neuroepithelium are in apposition. Retinal coagulation is used prophylactically against break formation and to prevent an established tear progressing to a retinal detachment.[3,6] Potential complications include cystoid macula oedema, ERM, choroidal detachment, exudative RD and retinal haemorrhage.

Cryotherapy

Cryotherapy uses nitrous oxide to freeze the retina.[4] This stimulates a chorioretinal reaction to repair and seal retinal breaks. Cryotherapy is best in cases of hazy media, small pupils and lesions near the ora. Explain to the patient to avoid strenuous exercise for 1 week, and reassure the patient that the chemosis and lid oedema and diplopia due to freezing of a rectus muscle is temporary.

Pneumatic retinopexy

A small gas bubble is inserted into the vitreous cavity.[3] The bubble presses against the back wall of the eye. Since the gas rises, this treatment is most effective for detachments located in the upper portion of the eye. The head must be in particular position so that the bubble covers the break. The gas bubble absorbs over the next 1-2 weeks. At that time, an additional procedure such as cryotherapy or laser photocoagulation is used to "tack down" the retina.[3] Complications include IOP spike, recurrent RD, cataract, ERM, and endophthalmitis. The patient should be dissuaded from flying on an aeroplane and should defer procedures requiring anaesthesia.

Vitrectomy

Usually referred to as trans pars plana vitrectomy (TPPV). TPPV is most commonly used for tractional retinal detachment but is also used for rhegmatogenous detachments if they are associated with vitreous traction or vitreous haemorrhage.[6] The procedure involves making small incisions into the sclera to allow the introduction of instruments into the vitreous cavity. The vitreous is first removed using a vitreous cutter. Next, depending on the type and cause of the detachment a variety of techniques (excision of tractional bands, air-fluid exchange, silicone oil fill, photocoagulation) are used to reattach the retina. Sometimes it is important for the patient to maintain a specific head position after surgery to keep the retina attached.

Silicone oil

In rare cases where the above surgeries are either inappropriate or unsuccessful, silicone oil may be used to reattach the retina. First, the vitreous is removed and replaced with silicone oil, which presses the retina into place. While the silicone oil is in the eye, vision is extremely poor. When the retina has resealed against the back of the eye, a second procedure may be performed to remove the oil. Do not be surprised to find a hyperopic shift as much as +6.00D.

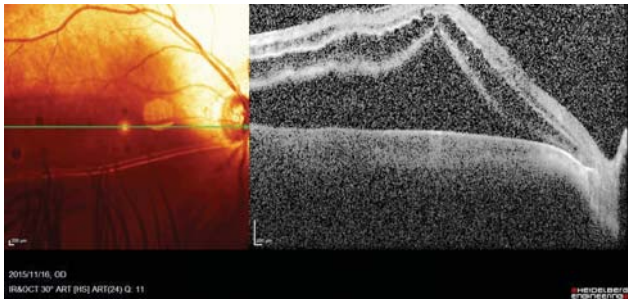

Figure 3. Fundus photograph of right eye showing a giant retinal tear (more than 90 degrees and corresponding OCT. Dr Matt Young, Durban, 2015

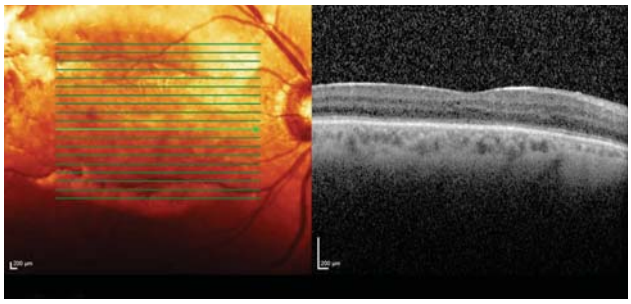

Figure 4. Fundus photo of right eye with corresponding OCT after pars plana vitrectomy, with endolaser and silicone oil endotamponde. Dr Matt Young, Durban, 2015.

CLINICAL PEARLS

- In symptomatic Rhegmatogenous RD, patients report photopsia, floating spots, peripheral visual field loss and depending upon the involvement of the macula, central blurring of vision with or without metamorphopsia.
- The common symptoms experienced by patients with exudative retinal detachments are vision loss and metamorphopsia consistent with the degree of macular involvement, with or without a visual field deficit and photopsia is very rare.
- Tractional retinal detachments may produce the same symptoms as rhegmatogenous and exudative retinal detachments. They may also remain asymptomatic until central vision is threatened.
- Pain is not a feature of any retinal detachment as the tissue has no pain receptors.
- Clinical observation of fresh RRD usually reveals a clumping of pigment cells within the vitreous (Shaffer's sign/tobacco dust) adjacent to the retinal break. An area of white or grayish elevated retina may be seen adjacent to the instigating retinal break secondary to influx of subretinal fluid (SRF). If a significant area of the retina is involved it may appear bullous and undulating.
- Associated findings of Rhegmatogenous RD may include posterior vitreous detachment and pre-retinal or vitreal haemorrhage.
- Horseshoe tear is a U-shaped tear is usually due to acute PVD and is symptomatic of photopsia and floaters.
- Lattice degeneration is sharply demarcated, circumferentially orientated; spindle-shaped arc of retinal thinning most frequently located between the equator and posterior border of the vitreous base. It is the most important degeneration directly related to RD.[2,3]
- Retinal pigment epithelial hyperplasia may be noted in cases of long-standing retinal detachment of any kind (pigment demarcation line). Increased RPE density is a feature of attempted self-repair.

CONCLUSION

Retinal detachment is a sight-threatening condition. Treatment depends on the cause of detachment. Therefore, an accurate diagnosis is important since visual prognosis depends on the underlying aetiology and early treatment can greatly improve the possibility of restoring vision

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