



# B-Scan Ophthalmic Ultrasonography of Retinal Detachment

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To Cite This Article: Uduma Fu. B-Scan Ophthalmic Ultrasonography of Retinal Detachment. *Am J Biomed Sci & Res.* 2019 - 4(5). AJBSR. MS.ID.000827. DOI: [10.34297/AJBSR.2019.04.000827](https://doi.org/10.34297/AJBSR.2019.04.000827)

Received: August 09, 2019 | Published: August 20, 2019

## Abstract

Retinal detachment (RD) is categorized into rhegmatogenous, tractional or exudative. In as much as it can be detected using ophthalmoscopy, elucidation with B-scan ocular ultrasonography is not hindered by opaque medium. Besides, B-scan can even give an insight into RD aetiologies and associations.

**Keywords:** Retina; B-scan ultrasonography; Detachment; Vitreous

## Learning Points

Grasping the diagnostic characteristics of retinal detachment using the seamless and non-invasive B-scan ophthalmic ultrasonography.

## Introduction

### Background

Retinal detachment (RD) is the separation of the neurosensory retina (anterior two-third) from the subjacent retinal pigment epithelium (RPE) {posterior one-third} [1].

### Classifications

RD is sub-classified into rhegmatogenous, tractional and exudative [2,3]. The former is the commonest.

### Epidemiology

Rhegmatogenous RD occurs in approximately 1 in 10 000 people annually but it has geographical variations [4,5].

### Pathophysiology

Rhegmatogenous RD arises from rhegma, implying a rent. When there is retina break, fluid ingresses from the vitreous cavity to the sub-retinal potential space causing retinal detachment [2,3,6]. While anomalies in water transport across RPE cause exudative RD, tractional RD is due to scarring from formation of pre-retinal fibro-vascular membrane.

## Risk Factors

Risk factors are Aging, Diabetes, Vascular retinopathy (Eales's disease), trauma, sickle cell retinopathy, endophthalmitis, axial myopia, post-cataract surgery, family history, RD in one eye, genetic disorders like Marfan's syndrome, pre-existing retinal disease like coloboma choroid, retinoschisis, and acute retinal infections like CMV [2,3]. Posterior vitreous detachment (PVD) is the most common cause of retinal tears, a known cause of rhegmatogenous RD [4].

## Clinical Presentations

Commonest presenting symptom is sudden, painless loss of vision or blurring of vision. Flashes and floaters may precede loss of vision pointing to PVD as the underlying aetiology of RD. Late presentation is seen in developing countries with involvement of macula in 90% of cases, retinal scarring and bilateral involvement [3].

## Diagnosis

Though RD can be diagnosed with indirect ophthalmoscopy, B-scan ultrasonography has additional merits of identification of RD even in opaque medium. Possible lesion aetiology and associations like ocular tumour, floaters, PVD and choroidal detachment are also highlighted.

## B-Scan Features

A typical echogram of RD is a V-shaped echogenic intra-vitreous relatively mobile band that is anchored posteriorly to the optic disc but anteriorly to the ora serrata. When totally detached, RD appears as elevated convex bullae extending far into the vitreous from known attachment points [2]. If a concave membrane becomes a convex configuration on follow up, it is indicative of development of a rhegmatogenous element. [2] Tractional RD shows as a concave membrane with a varying extent of vitreous adhesions. Shifting fluid is seen in exudative RD. Often, the detachment may be confined to the macula in inflammatory or infective conditions [2].

In chronic RD, bands become thickened, lowly reflective, less mobile and may harbour retinal cyst or reflective echoes of sub-retinal haemorrhage [2]. In cases of Proliferative Vitreous Retinopathy (PVR), the retina assumes a triangular or funnel shaped configuration which can range from open to tightly closed [2,7].

## Management

Retinal re-attachment surgery. This closes all retinal breaks and create strong chorio-retinal adhesions. RD with macula-on must be reattached within one week after macular detachment, otherwise visual recovery is progressively diminished [3].

## Complications

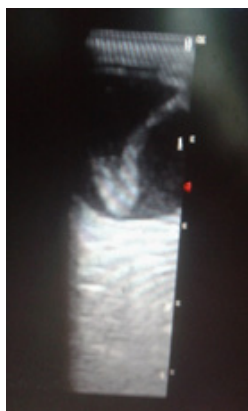
Chronicity of RD causes PVR, hypotony, pigmentary glaucoma, new iris vessels, cataracts and uveitis [3].

## Prognosis

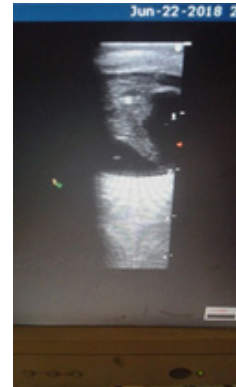
5-15% of retinal re-attachment surgeries are unsuccessful [8].

## Imaging Presentations

Figure 1 & 2



**Figure 1:** Coned view of B-scan echogram of an eye showing an intra-vitreous V-shaped echogenic band of retinal detachment that is anchored posteriorly to the optic disc (arrow) and anteriorly to the ora serrata (curved arrow).



**Figure 2:** B-scan ocular echogram showing closed funnel-shaped configuration of an intra-vitreous lesion of chronic retinal detachment (Arrow).

## Conclusion

Retinal detachment is a potential blinding condition that can be readily detected with B-scan ophthalmic ultrasonography due to pathognomonic features.

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