# OCT Findings in Ocular Decompression Retinopathy. A Review of the Literature.

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## Introduction

Ocular decompression retinopathy (ODR) is a rare complication occurring after rapid intraocular pressure lowering interventions. A 43 year old woman developed ODR after medical management of acute angle closure. OCT scanning showed macular oedema with intraretinal fluid localised to Henle fibre layer, central subretinal fluid, a bright hyperreflective line at the level of the outer plexiform layer (so-called prominent middle-limiting membrane (pMLM) sign) and a central bacillary layer detachment (BALAD) , which prompted us to review the literature for the OCT signs in ODR.

## Method

A Medline search for "ocular decompression retinopathy" returned 92 articles. Inclusion criteria for review were articles describing cases of ODR where OCT findings were reported or where the OCT image was included. 17 articles describing 19 eyes met the inclusion criteria and were reviewed. OCTs were examined and findings recorded.

## Results

Intraretinal fluid was the most common finding in 53% of eyes. Subretinal fluid was found in 26% of eyes. Haemorrhages (sub-ILM, intraretinal, subretinal, Henle fibre layer) were noted in 6 eyes (32%), the most common location being the Henle Fibre layer (4 eyes, 21%). Hyper-reflectivity of retinal layers suggestive of retinal capillary ischaemia was noted in 3 eyes (including pMLM sign, paracentral acute middle maculopathy (PAMM) and acute macular neuroretinopathy (AMN).



44 Year old Female. RE: Painful, Red, Fixed dilated pupil. VA 6/12. IOP = 60 mmHg. Colour fundus photo taken at opticians: NAD.

3/7 hx of blurred vision RE and frontal headaches. Hypermetropic. Depression, on Venlafaxine. Fhx: **glaucoma** (mother, father, grandparents). O/E: **Narrow angles** in both eyes. 0.4 CDR. Mild corneal oedema RE. IOP was **RE 75 mmHg** and LE 26 mmHg. RE acute angle closure. With medical management, 500mg IV Diamox, 250mg PO Diamox, Pilocarpine, Dorzolamide, Bimatoprost, Iopidine, Maxidex, Timolol. **IOP fell rapidly** over the space of **~60 mins** to **20 mmHg.** Corneal oedema cleared. Peripapillary haemorrhage noted RE, not there in the morning.

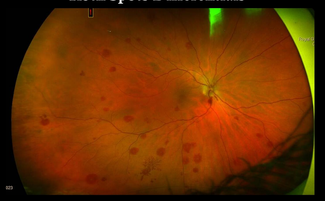
### The next day

RE VA 6/60. IOP RE 16 mmHg. RE: **swollen disc.** Bilateral peripheral iridotomy.

### OOH following day

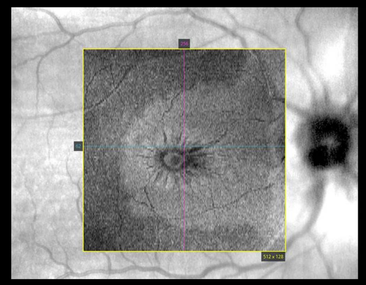
**RE vision HM**. IOP 17mmHg both eyes. RE swollen haemorrhagic disc. No arterial occlusion. **Widespread retinal haemorrhages**, Roth Spots. Left eye NAD. CT head + orbits & CT venogram, NAD.

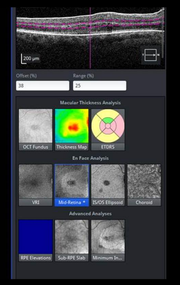
### Roth Spots Differentials

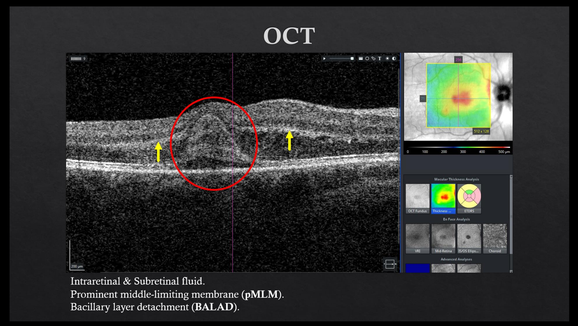


### "Australia shaped" scotoma centrally.

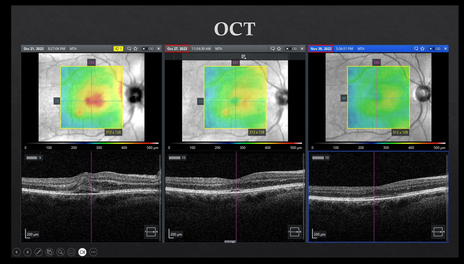
Patient reported worsening vision. & central scotoma. OCT on 21/10/23 looked like this...








Intraretinal & Subretinal fluid.
Prominent middle-limiting membrane (**pMLM**).
Bacillary layer detachment (**BALAD**).




**Ocular Decompression Retinopathy (ODR)**

Mechanical: Rapid reduction in posterior chamber volume and forward vitreous displacement. Vascular: Venous outflow obstruction. Signs present in our case suggestive of both.

## Literature Review of OCT Signs in ODR

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Intraretinal fluid was the most common finding in 53% of eyes. Subretinal in 26% of eyes.

Haemorrhages(sub-ILM, intraretinal, subretinal, Henle fibre layer) were noted in 6 eyes(32%).

**Hyper-reflectivity of retinal layers suggestive of retinal capillary ischaemia** at the level of the intermediate or deep capillary plexuses, was noted in **3 eyes** (including **pMLM** sign, paracentral acute middle maculopathy (**PAMM**) and acute macular neuroretinopathy (**AMN**).

## Conclusion

ODR is rare and most cases in the literature do not include OCT findings. OCT features include Henle fibre layer haemorrhage and pMLM sign, both associated with venous outflow impairment at the level of the deep capillary plexus. Other OCT signs (PAMM/AMN) indicate ischaemia at the level of the intermediate or deep capillary plexuses. OCT features can provide insight into the pathophysiology of ODR.

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