A Rare Case Of Subfoveal Choroidal Neovascular Membrane In Radiation Retinopathy- Combination Therapy Works...

Dr Gopal S Pillai, MD DNB FICO FRCS, Dr Abhijith Khake MBBS (DNB), Dr Lakshmi Nisha Menon DO (DNB), Dr Meenakshi Dhar MS, Dr Anuradha Rao MS DO, Dr Lilan Bhat MS DNB

Radiation retinopathy is commonly seen 1-2 years after radiation and occurs due to delayed retinal microvascular changes in the endothelial layer leading to capillary occlusion and microaneurysm formation. The fundus changes are similar to diabetic retinopathy changes. Subfoveal choroidal neovascular membrane in radiation retinopathy has been reported only once before in the literature, but it had not been treated successfully. We report such a rare case of radiation retinopathy which lead to the formation of a subfoveal choroidal neovascular membrane (CNVM) and was treated successfully with intravitreal bevacizumab (avastin) followed by Photodynamic therapy (PDT).

A 39 year old male who had undergone excision of hemangiopericytoma of left orbit followed by chemotherapy and radiotherapy 18 months back presented to the vitreo retina services with diminution of vision associated with metamorphopsia in his left eye of 2 weeks duration. There was no history of flashes or floaters, any recent stressful event, or any steroid intake. He was having watering and redness of the left eye for the last year. BCVA in the left eye was 6/9, and apart from the conjunctival congestion and dry eye, the anterior segment examination of the left eye was within normal limits. There was no corneal edema, cells or flare in the anterior chamber, good anterior chamber depth, normal pupillary reaction and accurate projection of rays. Fundus examination revealed a few microaneurysms and two cotton wool spots near the arcades suggesting a diagnosis of radiation retinopathy. Surprisingly there was also a hemorrhage seen in the subfoveal area. On further investigation with OCT there was a shallow sensory neural detachment at the fovea. On account of a suspicion of choroidal neovascular membrane he was advised a fluorescein angiography.

But unfortunately the patient came back to us after 1 month and his vision at this point of time had decreased further. The visual acuity in the left eye had dropped to 6/36 and fundus examination showed enlargement of the hemorrhage in the subfoveal region in the left eye. A sensorineural detachment was noticed around the hemorrhage at this time. Fluorescein angiography was done which showed a late leakage of the dye around the site of the hemorrhage. Thus a diagnosis of choroidal neovascular membrane was made on fluorescein angiography. OCT showed thickening of the foveal area with subfoveal detachment and cystoid macular edema with increased hyperreflectivity of the pigment epithelial layer.

We had discussed the various treatment options with the patient. Since there was no documentation of any successfully treated choroidal neovascular membrane with radiation retinopathy in the literature, and due to obvious economic reasons, the patient preferred an intravitreal bevacizumab injection. Intravitreal avastin
Fig. 1 Initial picture showing macular hemorrhage
Fig. 2 Initial OCT showing sensorineural detachment
Fig. 3 Hemorrhage has increased in 1 month
Fig. 4 OCT at 1 month showing the CNVM
Fig. 5 Hemorrhage and sensorineural detachment has increased after avastin injection
Fig. 6 OCT shows worsening after avastin injection
Fig. 7 Hard exudates after PDT and avastin
Fig. 8 OCT shows resolution
Fig. 9 Hard exudates resolving at 6 months
Fig. 10 OCT becomes normal after 6 months
injection was given after 2 days and he was advised to follow after 2 weeks.

When he came for follow up after 2 weeks his visual acuity had further dropped to 5/60 and fundus examination showed enlargement of the hemorrhage with increase in surrounding macular edema. His OCT showed increase in the thickness and hyperreflectivity at the RPE layer suggesting an increase in activity. Since the visual acuity was reducing day by day, we had planned our next step, i.e. Photodynamic therapy with intravitreal bevacizumab. He underwent the procedures the same week.

Follow up visit showed a decrease in the hemorrhage size and an increase in the amount of hard exudates. There was significant decrease in the macular thickness, cystoid macular oedema and sensorineural detachment on OCT. His vision had improved to 6/36. Since the patient showed improvement in vision and OCT, despite the emergence of hard exudates, the patient was advised a review after 1 month.

At the time of his next review his visual acuity improved to 6/18, fundus examination showed complete disappearance of the hemorrhage as well as the hard exudates. His OCT showed that the retinal thickness had normalized with normal foveal depression.

So to summarize, this patient had radiation retinopathy and developed a choroidal neovascular membrane with significant macular thickening, cystoid macular oedema, sensorineural detachment, hard exudates and edema. After the avastin injection, the edema and macular thickening increased. With PDT and a second avastin treatment, the thickness decreased at a much faster rate and more completely with the resolution of the subfoveal hemorrhage as well.

**Discussion**

Choroidal neovascular membrane in radiation retinopathy is very rare. There are only 2 documented case reports of choroidal neovascular membrane after radiation therapy. Out of the 2, one was far from the fovea and the other was extensive and untreatable. The extrafoveal area of neovascularisation in the first case was lasered. But this approach is not feasible in cases of subfoveal choroidal neovascular membrane, which develop at the fovea. In such situations, combination treatment with photodynamic therapy and anti VEGF agents may prove to be of benefit.

In this case, the reason for the development of choroidal neovascular membrane is not known. It is known that a Bruchs membrane break is needed for the development of a choroidal neovascular membrane. Whether radiation can lead to a Bruchs membrane defect is debatable. The other possibility is a recurrence of the orbital tumor into the nearby structures. But after a follow-up of almost a year, the choroidal neovascular membrane has not increased further. Further follow-up is required to know the prognosis of this case as the radiation retinopathy and the choroidal neovascular membrane may progress with time.

**References**