Reviewer's report

Title: Radiation Retinopathy: Case Report and Review

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Reviewer: Paul T. Finger, MD, FACS

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The authors describe a case of a young man who developed fulminant radiation retinopathy despite adequate precautions, due to the combined effects of pre-existing diabetes. We also discuss the current literature on treatment for radiation retinopathy.

Au: He received a total of 5250 rad to the tumour (1312.5 rad per week, 262.5 rad per session).
Rev: It is important to know what the total dose to critical eye structures (e.g. fovea, optic nerve, lens, lacrimal gland). Rad is an old term.

Au: On examination the visual acuity was noted to be 6/36 left eye and 6/9 right eye. He had epiphora and bilateral medial lower lid ectropion. Anterior segment examination was unremarkable, intraocular pressures were 16mmHG both eyes. Posterior segment examination revealed marked retinal ischaemia present in the posterior pole and macular region of both eyes.
Rev: This section should be limited to pertinent positives.

Au: Fundus Fluorescein Angiogram confirmed an ischaemic retina with no signs of neovascularization present (see figure 2). The appearance was not thought to be typical of diabetic changes, radiation retinopathy being the more likely diagnosis especially in view of his history.
Rev: It is sometimes difficult to differentiate between the two. It can be done with respect to the intraocular location of the retinopathy and temporal onset in relation to irradiation. This should be attempted in the text.

Au: Histologically these findings differ from diabetic retinopathy in that there is early loss of endothelial cells in radiation retinopathy compared to diabetic retinopathy where pericytes are affected initially. There are also less number of microaneurysms present compared to diabetic retinopathy 1,3
Rev: The authors should use these stated differences to analyze their case.

Au: The total dose of radiation, along with the fraction size is important in the development of retinopathy1-4. A reported safe dose is 3000 rads, 1000 rads per week in five fractions (200 rads per session)3, although cases have been reported with lower doses of radiotherapy 2, 4. The time of onset of radiation retinopathy is between 6 months – 3 years, again it has been known to occur earlier or later 2
Rev: The authors should use these stated differences to analyze their case.

Au: Recently a classification has been devised by Finger and Kurli14 which describes stages of radiation retinopathy in relation to the clinical signs seen, symptoms, location, best method of visualization and the risk of vision loss. This is important as there is a need for common language for this retinopathy for future comparative studies. Finger et al suggest that early pan retinal photocoagulation is useful in inducing regression of radiation retinopathy and also that treatment before clinically apparent radiation retinopathy is present may be more effective than treatment after its onset, especially in high risk cases. This is especially important in cases of radiation maculopathy as prevention is more likely to preserve vision than treatment after its onset. According to this classification our patient presented with a moderate risk of visual loss and rapidly progressed, over 4 months, to stage of severe risk of visual loss.
Rev: The authors mention that a clinical staging system exists, it is useful, but they do not stage their patient?

What next?: Accept after minor essential revisions

Level of interest: An article of importance in its field
Quality of written English: Needs some language corrections before being published

Statistical review: No

Declaration of competing interests:

I have no competing interests.