# Retrospective case series of patients with radiation induced optic neuropathy treated with hyperbaric oxygen

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## Introduction

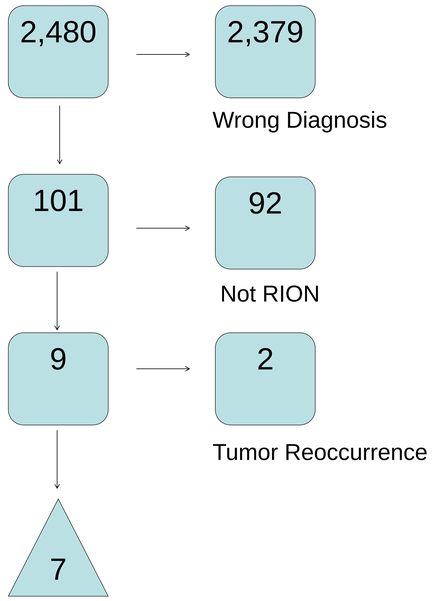
Radiation induced optic neuropathy (RION) is a rare but devastating complication of radiation treatment for cranial neoplasms, which typically develops months to years after treatment and often leads to blindness. Very little literature exists that demonstrates the efficacy of hyperbaric oxygen therapy in the treatment of RION. The purpose of this study was to evaluate our institutional experience in managing RION through a retrospective review of cases from a large urban academic center.

## Demographics

| Patient # | Age | Gender | Radiation Dose | Adjunctive treatments |
|---|---|---|---|---|
| 1 | 61 | F | Unknown | Prednisone |
| 2 | 66 | F | 5040 cGy | None |
| 3 | 52 | F | 4000 cGy | Dexamethasone, Prednisone |
| 4 | 54 | F | 3750 cGy | Prednisolone |
| 5 | 78 | M | Unknown | Predisone, Dexamethasone, Warfarin |
| 6 | 58 | F | 5400 cGy | Dexamethasone, Warfarin |
| 7 | 56 | M | 3000 cGy | Prednisone |

## Methods

A total of 2,480 Electronic medical records from January 2004 to January 2014 were searched to find patients treated with hyperbaric oxygen therapy for radiation induced optic neuritis. Records previous to this were not available in electronic form. A total of 101 patients with the primary diagnosis of radiation necrosis, radiation necrosis – brain, radiation necrosis – nerve, or radiation necrosis – nervous were examined closely. Of these patients, only 9 had been treated for radiation induced optic neuritis. 2 of these patients were excluded because they were eventually found to have tumor reoccurrence causing their vision loss. In all, a total of 7 patients were treated for radiation induced optic neuritis with hyperbaric oxygen therapy from January 2004 to January 2014.




## Results

| Patient # | Number of Treatments | Time from Symptom onset to start of treatment | Vision at the end of treatment | Vision at Ophtho F/U |
|---|---|---|---|---|
| 1 | 40 | 3 weeks | Stable | Stable |
| 2 | 40 | 6 months | Improved | Improved |
| 3 | 39 | 3 weeks | Stable | Stable |
| 4 | 40 | 7 weeks | Worsened | Worsened |
| 5 | 30 | 3 weeks | Stable | Worsened |
| 6 | 40 | 5 weeks | Stable | Worsened |
| 7 | 40 | 8 weeks | Stable | Worsened* |

*Worsened due to exposure keratopathy

| Patient # | Vision Prior: OD, OS | Time to Ophtho F/U | follow-up outcome, OD, OS |
|---|---|---|---|
| 1 | 20/50, CF | 4 weeks | 20/100 (pinhole correction 20/40), CF |
| 2 | 20/60, 20/20 | 4.5 months | 20/50, 20/25 |
| 3 | 20/20, CF | 6 weeks | 20/20, CF |
| 4 | NLP, shadow perception | after 27 treatements | NLP, LP |
| 5 | 20/200, 20/30 | 4.5 months | CF, 20/200 |
| 6 | 20/200, 20/25 | 10 months | hand motion, CF |
| 7 | 20/25, 20/70 | 6 weeks | 20/30, 20/400 (L facial palsy --> exposure keratopathy) |

CF: Count Fingers, LP: Light Perception, NLP: No light perception

## Conclusion

Stabilization or improvement of vision occurred in 3/7 patients treated with hyperbaric oxygen therapy for RION even weeks after treatments were discontinued. Due to the paucity of available treatments for RION and severe outcome of blindness, treatment for RION with hyperbaric oxygen therapy is reasonable.