Linear Accelerator Radiosurgery for Petro-Clival Meningiomas: The Fate of the Optic Tracts

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Disclosure

All authors have no relevant financial disclosures, nor any relevant conflicts of interest to disclose.
Introduction

Meningiomas of the Petro-Clival area are frequently treated by radiosurgery. The nearby optic tracts are exposed to high radiation in these cases. While anterior optic pathways are a well documented limiting factor for single dose radiosurgery given their exquisite sensitivity, no study has specifically assessed the clinical effect of high radiation exposure of the optic tracts. The purpose of this study was to assess the incidence of visual field defects associated with radiosurgery of Petro-Clival meningiomas.
Spatial relationship between optic tracts and a Petro-Clival meningioma
Methods

From 1993 to 2016, 138 patients with Petro-Clival meningiomas were treated with linear accelerator radiosurgery. The median prescribed dose was 1300 (13 Gy) to 80% isodose line. Follow up (minimum 2 years, maximum 23 years, median 60 months) was done with annual MRI and neuro-ophthalmological examinations.
Results

131 tumors (94.9 %) were controlled at end of follow up, of which 32.1 % were unchanged and 67.9 % experienced a reduction in size. 21% of treated patients experienced symptomatic improvement, which included improvements in cranial nerve function (CN-V, CN-VI, CN-VII, CN-VIII, CN-X), while 6.5% of treated patients developed new cranial nerve deficits (CN-III, CN-V, CN-VIII). Post-treatment visual field deficits (related to optic tract radiation injury) occurred in 3 patients (2.2 %), of which 2 of the 3 patients had transient visual field changes that resolved at later follow up.
Results (2)

Post Treatment Visual Field (Vf) Changes (n=138)

- No Post-Tx Vf Changes Noted (n=135) - 98%
- Post-Tx Vf Changes Noted (n=3) - 2%
Discussion

Single session Linear Accelerator (LINAC) radiosurgery is a safe and highly effective option for treating Petro-Clival meningiomas. Our data suggests that optic tracts tolerate radiation exposure to conventional radiosurgery doses without untoward effects on long term patient follow up.
Summary Points

• We investigated effects of linear accelerator radiosurgery for Petro-clival meningiomas on the optic tracts.

• A retrospective database analysis of 138 patients was performed specifically looking at visual field changes on long term follow-up.

• Of 138 patients treated, post-treatment visual field deficits (related to optic tract radiation injury) occurred in 3 patients (2.2 %), of which 2 of the 3 patients had transient visual field changes that resolved at later follow up.

• **Our data suggests that optic tracts tolerate radiation exposure to conventional radiosurgery doses without untoward effects on long term patient follow up.**