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## Introduction

There is controversy in the literature about the relationship between falcotentorial / convexity (F/C) meningiomas, brain edema and lack of local control after radiosurgery. Some research have associated this complications with venous drainage, size, radiation dosis, histology subtype, brain-tumor interface, vascular growth factors and others, with inconsistency among different studies. To date, there have been no published data evaluating the MRI DWI Apparent Diffusion Coefficient map (ADC) of these lesions and its radiobiology after Gamma Knife.

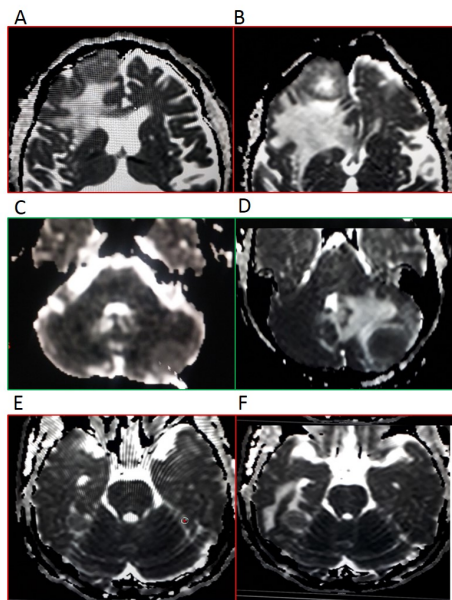
## Methods

This is a retrospective study in a population of 44 patients diagnosed with intracranial meningioma (17 F/C), irradiated with Gamma Knife, as initial or adjuvant treatment, at the Centro Gamma Knife Dominicano from July 2011 to July 2015. Median follow up of 24 months (3-48). Central tendency measures and association tests (Chi-square and Fisher's statistic) were used to measure the degree of association of these variables: tumor size before and after treatment, dose, vascularity, CSF cleft sign, perilesional edema pre- and post-radiation, location, ADC map intensity, local control and dynamics of the lesion. We used Kaplan-Meier curve to calculate the free growth period (local control). A  $p = 0.05$  was taken as statistical significance (SPSS, IBM 15.0 Chicago, IL).

## Results

40% (11) and 35% (6) of skull base and F/C meningiomas respectively were hyperintense on ADC map. Of these, none of skull base tumors had perilesional edema and 4 (66%) falcotentorial/convexity lesions were significantly associated with post radiosurgery edema ( $p = 0.004$ ). There was a tendency for hiperintense F/C meningioma (50%, 3 cases) to growth after radiosurgery but without a statistical significance ( $p = 0.08$ ).

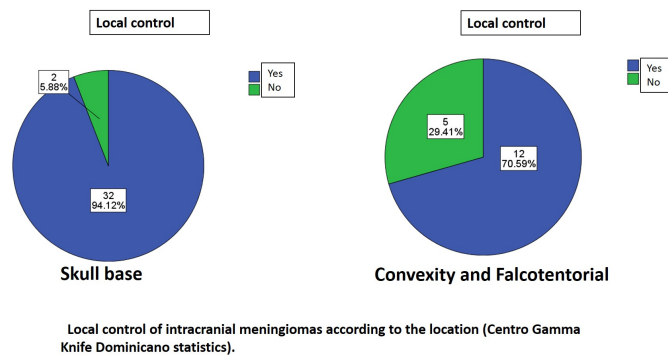
### Post radiation edema and growth pattern in ADC hyperintense meningiomas



**Fig. 5.** Post radiation edema and growth pattern in ADC hyperintense meningiomas. (A, B), pre and post GK frontal convexity meningioma. (C, D), pre and post GK left tentorial meningioma. (E, F) pre and post GK right tentorial meningioma.

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### Local control



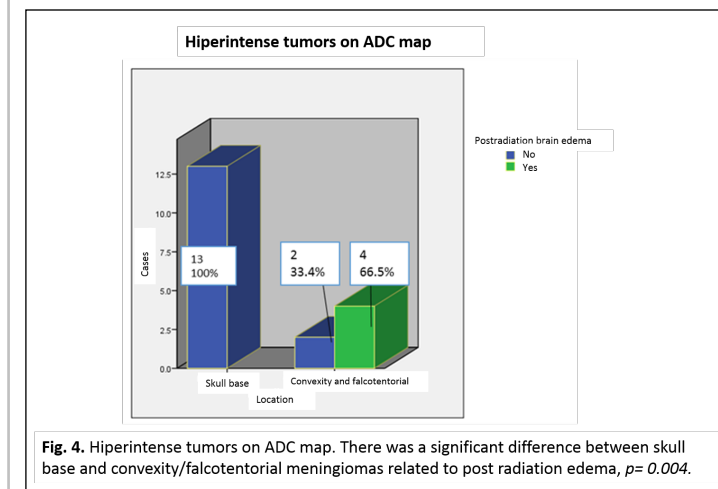
Local control of intracranial meningiomas according to the location (Centro Gamma Knife Statistics)

## Conclusions

MRI DWI ADC map hyperintensity in F/C meningiomas was an independent factor for post radiosurgery edema after Gamma Knife. Prospective studies are needed to confirm these results.

## Learning Objectives

By the conclusion of this session, participants should be able to consider the MRI DWI ADC map as an important factor to take into account for predicting outcome in radiosurgery of falcotentorial and convexity meningiomas.



**Fig. 4.** Hiperintense tumors on ADC map. There was a significant difference between skull base and convexity/falcotentorial meningiomas related to post radiation edema,  $p = 0.004$ .

## References

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