ATYPICAL MENINGIOMA: IS THERE A ROLE FOR POST-OPERATIVE RADIOTHERAPY?

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Introduction

- The optimal adjuvant management for patients with atypical meningioma remains controversial, particularly after a gross total resection (GTR).
- The goal of this study was to review long-term outcomes in such patients aiming at identifying potential factors associated with disease progression.
- In a parallel manner we investigated the following issues:
  - The minimal volume of residual disease that represent a cut-off at which radiotherapy should not be delayed beyond.
  - The growth pattern of atypical meningioma with or without radiotherapy.
  - The time lag detection of disease progression between volumetric and planimetric measurement.
Results I

- 40 patients (57%) underwent a gross total resection (GTR) and 30 (43%) underwent a subtotal resection (STR).

- PORT was delivered to 12 patients (30%) with a GTR and to only four (13%) with a subtotal resection (STR).

- With a median follow up time of 68.9 months, the 5-year progression-free survival (PFS) for GTR patients with or without PORT was 100% and 54.1%, respectively, (p=0.0058, 95%CI 66.4 - 123.3).

- Whereas, PFS for STR patients with or without PORT was 75% and 0%, respectively, (p=0.00026, 95%CI 7.7 - 16.53).
Results II

- On multivariate analysis, STR and PORT were found to be the only independent significant prognostic factors that associated with disease progression, with corresponding hazard ratios of 5.4873 (95%CI 2.19 -13.72, p=0.0003) and 0.0464 (95%CI 0.0059 - 0.364, p=0.0035), respectively.

- Based on Youden’s Index statistic, a cut-off value that correspond to a residual volume of more than 8.76 cm$^3$ at time of RT was associated with worse PFS (9% vs 56 %, p=0.0079, 95%CI 16.37 -123.3).

- In patients before receiving RT, the median relative and absolute growth rates, and tumor doubling time were 124.2%/year, 4.8 cm$^3$/year and 1.67 year, respectively.

- These indices changed after RT to be 0.245%/year for relative growth rate, minus 0.09 cm$^3$/year for absolute growth rate and minus 0.005 year for the doubling time, respectively, p < 0.05 for all comparisons, “negative values represent tumor shrinkage”.

- An earlier detection of failure was documented by measuring changes in residual tumor volumetrically rather than planimetrically (with median time lag of 18 months).
Discussion/conclusions

Atypical meningioma can behave aggressively and the disease progression rate, even after a GTR, remains high.

The routine use of PORT remains a controversial issue particularly after GTR.

Our data suggest that PORT reduces the disease progression rate and should be considered in most patients.

Our study provides new information on the importance of using volume measurement to determine disease progression.

This study identified variables of prognostic impact and parameters on tumor growth rates that may aid physicians in selecting patients that may benefit from an earlier adjuvant PORT.

The potential benefit of PORT post-GTR in patients with atypical meningioma needs be confirmed on a randomized trial.