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Growth rate of non-operated meningiomas

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Abstract

Introduction Meningiomas are dural-based brain tumors that are typically histologically benign. Some meningiomas grow slowly or seemingly not at all with planimetric measurement. Volumetric measurement may be more accurate because tumors may grow in different directions than the planimetric axes.

Methods Twentyone patients (with 22 tumors) had serial MRI brain scans available for review. We reviewed the charts and measured tumor dimensions on the MRI scans. Relative growth rates were calculated for volume and maximum initial diameter using published formulas. Patient demographics, tumor location, and special radiologic characteristics (calcification, T2 hypointensity, dural tail, mass effect, and midline shift) were compared to the volumetric growth rate.

Results Patients included 17 females and 4 males; age at diagnosis 36 to 74 years (mean 61). Follow-up was 2.08 to 10.83 years (mean 3.64). Most tumors were located in the convexity (27.27 %), sphenoid wing (27.27 %), or cerebellopontine angle (13.04 %). Two meningiomas (9.09 %) demonstrated no growth. The mean relative volumetric growth rate was 5.82 %/year, and planimetric was 2.00 %/year (difference 3.82 %/year, p-value < 0.0001). Convexity location had near significant association with slower relative volumetric growth. There were no significant associations between other tumor locations, age, gender, or radiologic characteristics and volumetric growth.

Conclusions The mean volumetric growth rate was significantly greater than the planimetric growth rate, suggesting that volumetric measurement conveys more information and is superior in assessing tumor growth. This information could have clinical value in determining the frequency of follow-up imaging and the urgency of surgical intervention.

Key words growth rate - meningioma - non-operated - volume measurement

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References secured to subscribers.

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