

## Defining tumor growth in vestibular schwannomas

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# Defining tumor growth in vestibular schwannomas: a volumetric inter-observer variability study in contrast-enhanced T1-weighted MRI

## **Type of abstract:**

abstract for oral presentation

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## **Topic:**

Imaging &, interventional radiotherapy

## **Introduction:**

For patients with vestibular schwannomas (VS), the need for reliable volumetric tumor monitoring is important. Currently, a volumetric cutoff of 20% increase in tumor volume is widely used to define tumor growth in VS. This study investigates the volumetric limits of agreement (LoA) of VS by an inter-observer study.

## **Methods:**

This retrospective study included 100 VS patients who underwent contrast-enhanced T1-weighted MRI. Five observers volumetrically annotated the images. Observer agreement and reliability was measured using the LoA, estimated using the limits of agreement with the

mean (LOAM) method, and the intraclass correlation coefficient (ICC). Influence of imaging parameters and tumor characteristics were assessed using univariable and multivariable linear regression analysis.

**Results:**

The 100 patients had an average median tumor volume of 903 mm<sup>3</sup> (IQR: 193-3101). Peritumoral cysts were found in 6 patients. Patients were divided into four volumetric size categories based on tumor volume quartile. The smallest tumor volume quartile showed a LOAM relative to the mean of 26.8%, whereas for the largest tumor volume quartile this figure was found to be 7.3% and when excluding peritumoral cysts: 4.8%. Of all imaging parameters and tumor characteristics, only tumor volume was associated with the LoA (adjusted B=-0.001 [P=0.003]).

**Conclusion:**

Agreement limits within volumetric annotation of VS are affected by tumor volume, since the LoA improves with increasing tumor volume. As a result, for tumors larger than 200 mm<sup>3</sup>, growth can reliably be detected at an earlier stage, compared to the currently widely used cutoff of 20%.