Predictors for Resectability in Intra- and Extraforaminal Dumbbell-Shaped Schwannomas in the Cervical Spine

Sung Mo Ryu MD; Seung-Kook Kim; Sun-Ho Lee MD; Whan Eoh MD; Eun-Sang Kim

Introduction

Regarding surgical treatment of spinal schwannomas, particularly in cases that approach and tumor removal would be jeopardous such as intra- and extraforaminal dumbbell-shaped schwannomas in the cervical spine, preoperative planning is very important. Currently, radiologic features in regards to indicators of resectability for spinal schwannomas are not well defined.

Methods

Fifty patients who underwent surgical treatment for cervical dumbbell-shaped schwannomas that had both intra- and extraforaminal involvement were retrospectively analyzed. We focused on the relationship between preoperative magnetic resonance (MR) features and the extent of tumor removal. The MR features considered for the study included extension of the tumor, signal intensity (SI) in T2-weighted images (WI), and the presence of vertebral artery (VA) involvement.

Results

Of the 50 patients, gross total resection (GTR) was achieved in 23 of 50 patients (46%), and subtotal resection (STR) in 27 (54%). The recurrence rate for GTR and STR groups were 0% (0/23 cases) and 7.4% (2/27 cases), respectively ($p = 0.497$, Fisher's exact test). Univariate analysis demonstrated that Eden's classification (OR 3.69, 95% CI 1.14-11.98; $p=0.029$), intact VA (OR 12.44, 95% CI 2.88-53.77; $p=0.001$), and hyper-SI on T2-WI (OR 6.18, 95% CI 1.19-32.08; $p=0.030$) were significant predictor of GTR. In addition, VA involvement was the only significant predictor of GTR in multivariate analysis (OR 12.40, 95% CI 2.16-71.35; $p=0.005$).

Conclusions

Resectability for spinal schwannomas could be estimated by intact VA and hyper-SI on T2-WI.

Learning Objectives

To investigate the relationship between preoperative magnetic resonance (MR) features and the extent of tumor removal.

[Default Poster]