

Gamma Knife Radiosurgery for Vestibular Schwannomas – preliminary outcomes at 2 years follow-up



Cornel Tancu, Robert Bradford, Neil Kitchen

Background: In October 2012, Gamma Knife stereotactic radiosurgery (GK SRS) became available for the treatment of vestibular schwannomas (VS) at the Queen Square Gamma Knife Centre. The proportion of our VS patients allocated to this less invasive treatment modality has increased gradually since then.

Aim: To assess the intermediate tumour control rate (minimum 2 years follow-up), cranial nerve functional outcomes and delayed side-effects (minimum 1year follow-up) after GK treatment for VS.

Patients and method: One hundred seventy-nine (179) patients were treated by GK radiosurgery for VS between 29/10/2012 and 27/10/2016. We assessed the functional outcomes after minimum 1 year follow-up in 128 patients and the radiological outcomes in 72 patients who had an available MRI scan at minimum 2 years of follow-up. Data about pre-treatment hearing status was not always available in this population. Useful hearing (class 1 or 2 on Gardner-Robertson classification) was recorded in 35% of cases before the treatment.

Results: Average tumour volume at treatment was 2.15cc (0.04cc – 9.59cc). Large VS (stage IV on Koos classification or above 4 cc) represented 16.2%. The marginal (prescription) dose was 13 Gy for 94.4% and 12 Gy for 5.6% of the lesions. The average treatment duration was 39.5 minutes.

Cumulative gross tumour control rate at 2 and 3 years was 98.6%.

For the 32 cases with 3 years follow-up, 53% had a reduced volume, 25% were stable and in 22% (7cases) the tumour increased. Five cases still showed slight tumour progression between 2 and 3 years, but the rate of growth was reduced. None of this case has a definite treatment failure and no surgical resection was required in this sub-group of patients.

Thirty-nine cases with 2 years follow-up, showed reduced volume in 51%, stability in 28% and increased volume in 21% respectively. One case of definite tumour progression has

occurred at 2 years and required surgery. There were 3 cases (4.22%) of symptomatic hydrocephalus, two of them requiring a VP shunt insertion.

Four patients out of 128 presented mild transitory facial palsy, but in only 2 cases (1.5%) these were grade 3&4 House-Brackmann and improved gradually. Facial hemispasm was noted in 2 patients (1.5%). The persistence or temporary aggravation of vestibular symptoms or of the tinnitus was the most frequent complaining symptom after GK procedure (29.7%). Temporary worsened facial numbness was recorded in 10 cases (7.8%). Hearing preservation rate at 1 year and 2 years follow-up were 47% and 44% respectively.

Discussion and conclusions: Preliminary results showed a very good tumour control rate (98.6%) after minimum 2 years of follow-up. Three years is the minimal period to conclude about GK efficacy and further evaluation of this series is required. Preservation of the function of cranial nerves remained good. The most frequent complications were the persistence of the balance disturbances and of the tinnitus after procedure. Quality of hearing before GK may have an important role in long-term hearing preservation.