

## Title:

### **Long term results of Gamma Knife surgery for trigeminal neuralgia using 90 Gy distal to root entry zone protocol**

## Authors and Institution:

CP Yu, YW Fan, KM Leung

*Hong Kong Neurosurgical Associates*

## Abstract:

### **Object**

Gamma Knife surgery (GKS) is one of the options for medically refractory trigeminal neuralgia (TN), but long term results were regarded as inferior to microvascular decompression (MVD). The authors reported the long term results of treating primary TN by GKS, using a high dose non root entry zone protocol .

### **Methods**

64 patients between March 1995 and June 2013 were included. Minimum follow up time was 12 months. Mean age was 62 years. Follow up duration was mean 76 months (median 61 months, range 12-210 months). Radiosurgical technique included TN frame position, 3D MRI, and one 4 mm shot delivering 90 Gy maximum at the cisternal part of the trigeminal nerve distal to root entry zone. All data was collected prospectively. Follow up was done by clinical visits and telephone communication. The authors used Barrow Neurological Institute (BNI) Pain Intensity Scale to measure the pain control and the BNI Facial Numbness scale to assess adverse effects.

### **Results**

64 patients received 73 procedures (10 had 2nd GK as salvage). After GKS, 36 patients (66.7%) attained BNI I (no pain, no medications), none at BNI II (occasional pain, no medications), 12 (22.2%) at BNI III (mild pain, controlled by medications), none at BNI IV, and 6 (11.1%) at BNI V. Overall 48 (88.9%) achieved good to excellent pain control (BNI score I - III). 14 (25.9%) had new numbness. Only 2 (3%) graded it as moderately bothersome (BNI III). None had anesthesia dolorosa. Mean time to achieve initial pain control was 2 weeks. Mean time to achieve stable pain free and medication free status was 12 months. For the 10 patients who had second GK after failed first procedure, all attained BNI 1 control, although the numbness rate was to 50%.

### **Conclusion**

GKS using 90 Gy at a point distal to the root entry zone achieved long term pain control at 88.9%, approaching that of MVD, with minimal morbidity. The main disadvantage was much slower response time.