

## **Results Of A Contemporary Series Of Minimally Invasive Microsurgery For Glioblastoma: Extent Of Resection, Complications And Benefit Of Surgery**

**Diez Valle Ricardo**<sup>1</sup>, Victoria Becerra Castro<sup>1</sup>, Sonia Tejada Solis<sup>1</sup>

<sup>1</sup>Neurosurgery/ Clínica Universidad De Navarra/ Spain

### **Purpose**

Review results of resection of glioblastoma (GBM) using minimally invasive, fluorescence-guided microsurgery (FGS).

### **Materials and Methods**

Our Department keeps a prospective database since 2008. A review 2008-2016 found 177 cases with resection for newly diagnosed GBM. FGS with 5-ALA, navigation guidance and minimally invasive technique were used in all cases. High field intraoperative MRI (3T) was used in the last 20. Clinical and radiological data, including pre and postoperative tumor volume, complications, and size of the craniotomy were collected. Cox regression model was used to study influence of variables on survival.

### **Results**

Mean age was 60.4 (28-82). Median OS was 17 months. Complete resection of enhancing tumor (CRET) was the objective of surgery in 144 (81%) and was achieved in 80% of those and in 65% of the whole series. Mean extent of resection (EOR) was 98%. Reasons for incomplete resection included missed rests in 11%, and neurophysiological monitoring warning in 9%. Neurological status at hospital discharge was unchanged from pre-operative in 61%, better in 25% and worse in 14%.

Mean surface of the craniotomy was 14 cm<sup>2</sup>. There were no 30 days mortality in the series. Variables independently associated with OS included: MGMT methylation ( $p < 0.001$ ), Age ( $p = 0.001$ ), KPS ( $p = 0.028$ ) and EOR ( $p = 0.002$ ). CRET significantly increased survival also in high risk subgroups of unmethylated MGMT, patients older than 70, and patients with KPS < 80.

### **Conclusion**

Maximum EOR improved survival for all the patients subgroups. Minimally invasive microsurgery allows efficacy with very low complication rates giving a good risk/benefit ratio.