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# Survival outcome of multiple resections in patients with glioblastoma multiforme (GBM) in the South Australian population

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**Objectives:** Surgical reresections have been reported to prolong survival in patients with glioblastoma multiforme (GBM). This is a retrospective analysis of a single centre in Australia to compare the survival outcome of patients with GBM who underwent surgical reresections to those treated with single resection.

**Methods:** The records of adult patients who underwent surgery for GBM at a tertiary hospital in the year 2010- 2011 were retrospectively analysed. The included variables were age, date of diagnosis, functional status, tumour location and size, extent of resection, adjuvant therapy, number of resections, perioperative complications and date of last follow-up. Kaplan-Meier method and survival rates were compared using log-rank analyses.

**Results:** 56 patients were operated in the year 2010-2011 for glioblastoma multiforme. 35 patients had single resections (median age 66 years). 21 patients (Table 1) subsequently had reresections (median age 56 years). The commonest presenting symptoms in the reresection group were headaches (35%) and confusion (35%). 16 (80%) patients who underwent reresections had preoperative KPS 80-90. The average maximum tumour diameter was 4cm. The frontal and temporal lobes were the commonest tumour locations. The median interval time from 1st to 2nd resection was 13.5 months, 8.8months from 2nd to 3rd resections and 5 months from 3rd to 4th resection. There is a statistically insignificant trend for longer median survival in patients who underwent reresections versus single resection, 20 months and 7 months ( $p=0.08$ ), respectively.

**Conclusions:** The median overall survival of a South Australian adult GBM patient was 13 months. However, due to its small sample size, this study is unable to confirm statistically significant difference in the median survival between single versus surgical reresections in GBM patients.

Resection numbers	1	2	3	4
No. of patients	35 (63%)	15 (27%)	3 (5%)	3 (5%)

Table 1. Resection numbers in GBM patients in 2010-2011 in a single centre in SA.

	Single Resection (n=35)	Reresections (n=21)
Age (median)	66 years	56 years
Maximum tumour diameter (mean)	4 cm	4.3cm
Commonest tumour location	Left temporal lobe 29% (n=10)	Right frontoparietal lobes 38% (n=8)
Gross total resection (Assessed with postoperative MRI)	17% (n=6)	24% (n=5)
Adjuvant treatment (Temozolamide + Radiotherapy)	77% (n=27)	100% (n=21)
Median overall survival (OS)	7 months	20 months
Range of overall survival	1- 54 months	7- 46 months

Table 2. Comparisons of variables recorded for patients with GBM treated with single resection versus reresections.

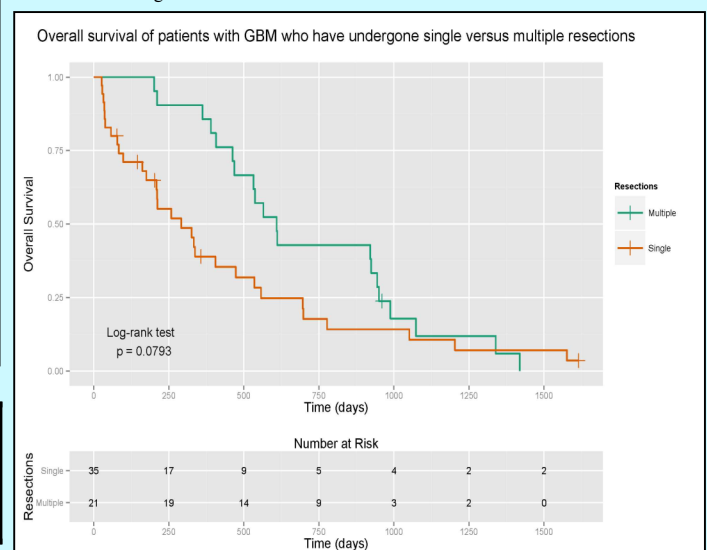


Figure 1. Kaplan-Meier curve showing statistically insignificant trend of increased median overall survival in the GBM patients treated with multiple resection versus single resection group, 20 months and 7 months respectively,  $p=0.08$ .