Malignant gliomas:

- Malignant gliomas include AA, GBM, anaplastic oligodendroglioma and gliosarcoma, giant cell glioblastoma.
- Clinical features: 1. Increased ICP (headaches, vomiting etc...) 2. Focal symptoms and signs depending on the location 3. Seizures
- Diagnosis: CT , MRI, MRS, PET (Hot lesion)
- Treatment and controversies:

I. Surgery: controversies include biopsy vs. resection and the extent of resection and the effect on survival.

Arguments in favour of biopsy or limited resection

1. Malignant gliomas are diffuse tumours extending beyond the gross pathology and radiological margin. Autopsy studies showed tumour cells extending > 4 cm from the gross tumour margin and into the other hemisphere. Stereotactic biopsy of non-enhancing, hyperintense on T2 areas demonstrated malignant cells in some studies.
2. Oncologically meaningful cytoreduction requires 2 log reduction in the number of cells (99% removal) which is difficult to achieve
3. Radical resections may be associated with higher mortality and morbidity
4. No class 1 or 2 evidence showing significant improvement in survival with radical resection. Retrospective studies are difficult to interpret (selection bias with younger patients, in good status with small tumours in non eloquent brain undergoing radical resection and inmost published series the extent of resection was based on surgeon's assessment rather on postoperative scans).

Arguments in favour of radical resection;

1. Rapid reduction in the mass effect and improvement in symptoms and function.
2. With current techniques (navigation, ultrasonic aspirator, functional mapping the morbidity and mortality from surgical resection are minimal.
3. Provides larger sample for histology (avoids sampling errors)
4. Potential for cytoreduction.

I. **Radiotherapy:** Radiotherapy was shown to double survival in patients with malignant gliomas. Patients with good general health and good functional status (KFS>70) are given 5000-6000cGray over 6 weeks (30 fractions)

Elderly Patients with poor functional status are given palliative radiation 300cGray (10 fractions) over 2 weeks

Radiotherapy works by producing free oxygen radicals and hence is less effective in hypoxic (necrotic) areas of the tumour.

II. **Chemotherapy** has limited role in the management of GBMs. It is used to treat patients with recurrent GBM who had radiotherapy and are not for surgery.

The most commonly used regimes are:

1. Intravenous PCV (Procarbazine, CCNU and vincristine). Most primary oligodendrogliomas and mixed gliomas (oligoastrocytomas) respond to treatment with procarbazine, lomustine, and vincristine (PCV), with response rates of approximately 80%
2. Oral Temozolamide(alkylating agent): main side effect is thrombocytopenia

Chemotherapy is more effective in the treatment of anaplastic oligodendrogliomas and mixed oligoastrocytomas.

III. **Other treatment modalities: Immunotherapy** using tumour vaccines, dendritic cell vaccines, interferon, anti growth factors, **Brachytherapy**, **phototherapy**, **gene therapy** have been used in the treatment of small number of patients with reported encouraging results. Most these modalities are experimental and the number is small to make any conclusions

Prognosis: Radiotherapy, age and functional status at presentation are the most important predictors of outcome.
Average survival with surgery alone is 16 weeks.
Average survival with surgery +RT is 39 weeks.
Average survival with surgery +RT +CT: possibly few weeks better than w/o CT.