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## Clinical characterization of a real-life cohort of 6001 patients with brain metastases from solid cancers treated between 1986-2020

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### Background

Precise clinical characterization and prognostic assessments in brain metastases (BM) patients are important to guide individualized treatment decisions and clinical trial development.

### Methods

6001 patients with newly diagnosed BM treated between 1986-2020 were identified from the Vienna Brain Metastasis Registry.

### Results

Frequency of the primary tumor did not shift over the observation period with lung cancer being the most frequency source of BM (50.5%) followed by breast cancer (16.0%), melanoma (11.1%), colorectal cancer (5.8%), renal cell carcinoma (5.5%) and BM of unknown primary (2.5%). A rising incidence of BM diagnosed by screening in absence of neurological symptoms was found ( $p < 0.001$ ; 1986-1999:15.3%; 2000-2009:25.5%; 2010-2020:31.4%). A significant change in initial BM treatment approaches was observed during the decades ( $p < 0.001$ ): 36.8% of the patients received stereotactic radiosurgery (SRS) between 1986-1999, while 56.3% between 2000-2009. Furthermore, an increase in systemic treatment (1986-1999: 0.4%; 2010-2020: 2.4%) and a decrease in neurosurgical resection (1986-1999: 39.3%; 2010-2020: 20.4%) as initial BM treatment approaches were observed. Patients diagnosed with BM between 1986-1999 presented with an unfavorable median overall survival (5 months) compared to patients diagnosed between 2000-2009 and 2010-2020 (7 months, each;  $p < 0.005$ ). Furthermore, the diagnostic- specific graded prognostic assessment (DS-GPA) (Hazard ratio [HR] 1.42;  $p < 0.001$ ), and the GPA for lung cancer using molecular markers (Lung-molGPA) (HR 1.67;  $p < 0.001$ ) and for melanoma using molecular markers (Melanoma-molGPA (HR 1.46;  $p = 0.011$ ) showed statistically significant correlation with overall survival.

### Conclusions

For BM patients, treatment patterns have changed towards increased use of SRS as well as systemic therapies, and survival times have improved over time. Furthermore, our data confirm refinement of BM-specific prognostic scores by incorporation of molecular data.

### Legal entity responsible for the study

The authors.

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### Disclosure

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