Improvement in survival in era of immunotherapy for melanoma patients treated with stereotactic radiosurgery for brain metastases in Leeds Cancer Centre between 2009-17

F Slevin, M Marples, P Hatfield

1 Leeds Cancer Centre, UK

Purpose

• Melanoma is the fifth commonest cancer in the UK [1].
• Distant metastases are common including to the brain, which is associated with a poor prognosis [2]. Median overall survival for patients treated with stereotactic radiosurgery in Leeds between 2009-11 (prior to introduction of BRAF inhibitors) was only 3 months.
• Recently introduced systemic anticancer therapies including immunotherapy and BRAF inhibitors may lead to improved outcomes, particularly if brain disease can be controlled using stereotactic radiosurgery.
• We wished to determine the impact of novel therapies for patients treated at Leeds Cancer Centre.

Materials and methods

• Retrospective review of in-house database containing all patients treated with stereotactic radiosurgery between 2009-17 and comparison with electronic patient records to determine outcomes and prognostic factors for melanoma patients with brain metastases treated with stereotactic radiosurgery using Gamma Knife®.

Results

• 67 melanoma patients were treated with stereotactic radiosurgery between 2009 and 2017.
• 13 patients were treated between 2009-11 and 54 patients received treatment after this time from 2012-17.
• Median overall survival for patients treated 2012-17 was significantly greater at 11 months compared with 3 months for the initial cohort (Figure 1). This is comparable with published outcomes of 10.7 months reported by Kocher et al in 2011 [3].
• 11 patients treated with PDL1 inhibitor pembrolizumab (Figure 2) and 11 patients treated with CTLA4 inhibitor ipilimumab (Figure 3) survived significantly longer (median overall survival undefined and 15 months respectively) than those untreated (median overall survival 8 months and 7 months respectively).
• No statistically significant difference in survival was observed between those treated and untreated with BRAF inhibitors. Survival also did not appear to differ based on presence of extracranial metastatic disease; symptomatic brain metastases; development of brain metastases at diagnosis versus on progression of known metastatic disease; nor BRAF mutation status. 
• Potential confounders limiting interpretation of these results include the retrospective nature of this study; relatively small numbers of patients treated and significant proportion of patients received either both types of immunotherapy (4 of 11 patients, 36%) or both a BRAF inhibitor and an immunotherapy (4 of 18 patients, 22%).

Conclusion

• Treatment with immunotherapy was associated with a significantly increased overall survival following stereotactic radiosurgery.
• Management of intracranial disease with stereotactic radiosurgery is recommended to permit treatment with novel agents including immunotherapies.