**Reviewer’s report**

**Title:** Development of a Disease-Specific Graded Prognostic Assessment index for the management of Sarcoma patients with Brain Metastases (Sarcoma-GPA).

**Version:** 0  **Date:** 11 Aug 2019

**Reviewer:** Marcus Tan

**Reviewer's report:**

Overall

This is an excellent paper which addresses a rare but heterogeneous issue in patients with sarcoma. While I believe that the work merits publication, the following comments would add to the significance of the work.

**Major comments**

- I would recommend inclusion of some quantitative measure (e.g. c-index) of goodness of fit of the prognostic index. This is a standard part of most development of most models, and it is surprising that it was not included in the recent lung and melanoma papers of Sperduto (PMID: 27892978, 29063850). Use of the c-index would quantify how much better the new index is compared to the GPA.

- please give a breakdown of the combinations of treatments the patients received, i.e. SRS alone vs SRS + Surgery vs surgery alone etc.

- even though the aim of the manuscript is to define pre-treatment variables that are prognostic for sarcoma patients with brain metastases, prognosis is obviously also determined by how these patients are treated. Therefore, I would suggest including treatment variables in the uni and multivariate analysis to give the reader some insights into how surgery, SRS, whole brain RT are associated with prognosis (even if these treatment variables are later omitted from development of the prognostic index). It is interesting to note that 88% of patients received SRS, and 82% received surgery, but also that 58% received WBRT. This suggests that the majority of patients received all three modalities - quite different from the recent melanoma and lung papers. Further analysis of this is warranted - was this 3-part treatment decided a priori, or was WBRT (for example) delivered for other brain metastases that developed after the index brain metastasis? If a priori, then was use / omission of WBRT associated with survival?
Minor comments
- text within the tables of Figure 1 are unreadable, so it is impossible to read which variable is being assessed in each K-M survival curve
- in figure 3a, the authors state that the PS being used is the ECOG, rather than KPS

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

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