Reviewer's report

Title: "Unique trend" and "contradictory trend" in discrimination of primary synchronous lung cancer and metastatic lung cancer

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Reviewer: William Coleman

Reviewer's report:

This is an interesting manuscript that addresses an important clinical problem in lung cancer diagnosis - distinguishing multiple primary lung cancers from metastatic lung cancer. The authors use an innovative experimental approach and the results are possibly paradigm-shifting.

Comments:

1. The authors utilize three tables to describe the 23 patients included in this study. These tables should be combined into a single table. Each of the submitted tables (Tables 1-3) contain a column for "follow-up" and there are no notations for any patient in any of the tables. Hence, this column should be deleted. Appropriate definitions of the abbreviations used should be included in a footnote (for RML, LLL, LUL, etc).

2. Methods - The authors describe the microsatellite markers utilized in the analysis of these cancers, but do not provide a basis for their selection.

3. Table 4 shows all the results for 6 polymorphic microsatellite markers for 23 patients and 46 cancers (with patients designated Patient 1 through Patient 23. Tables 5-7 simply reproduce these same results but subdivided by category (like primary and metastatic cancers), with renumbering of patients (so Patient 14 in Table 4 is Patient 1 in table 5). The inclusion of this data in a single table should suffice. Tables 5-7 are directly duplicative and should be deleted.

4. The table of microsatellite data (Table 4) contains plus/minus signs to indicate detection or absence of alleles. The authors should indicate in the text or table footnote what + versus ++ indicates.

5. The text associated with the analysis presented in Table 5 indicates that the tumors in Patient 2 and 7 were labeled T1 and T2 arbitrarily resulting in T2 reflecting the primary and T1 reflecting the metastatic lesion. The methods appear to imply that primary tumors are labeled T1 when known. This needs to be corrected and the tumors relabeled to eliminate confusion in the presentation of the data.

6. The discussion is excessively long and should be appropriately trimmed for length.

Level of interest: An article of outstanding merit and interest in its field
Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests