

Clinical Outcomes Following Multidisciplinary Molecular Tumor Board Evaluation in Patients with Lung Cancer

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Background

Genomic profiling has expanded treatment options for cancer patients by identifying actionable molecular alterations that guide precision therapy. Lung cancer is among the most extensively molecularly characterized solid tumors, with numerous genomic alterations that can inform targeted treatment strategies¹. In a study of 956 patients with non-small-cell lung cancer, Huang et al. found that patients who underwent Molecular Tumor Board (MTB) review had improved overall survival compared with propensity-matched patients who did not undergo MTB review². The MTB at the Herbert-Herman Cancer Center was established in 2017, and its outcomes have been evaluated across a variety of cancer diagnoses; however, outcomes specific to lung cancer have not been examined³. Given the expanding role of molecularly guided therapy in lung cancer, we sought to evaluate the clinical outcomes and implementation of MTB recommendations in patients with lung cancer at the Herbert-Herman Cancer Center.

Methods

We conducted a retrospective chart review of 57 patients with small cell lung cancer (SCLC) or non-small cell lung cancer (NSCLC). Data included demographics, histology, genomic alterations, MTB recommendations, subsequent treatments, and reasons for non-implementation of recommended targeted therapies. Statistical analyses were performed using AI-assisted analysis and reviewed and verified by the study authors.

Table 1. Patient Demographics and Disease History

Demographics	MTB Patients (%)
No. patients	57
Mean Age (years)	67.9
Age range (years)	31-92
Gender (Male:Female)	24 (42.1):33 (57.9)
Disease histology	
Adenocarcinoma	34 (59.6%)
Squamous cell carcinoma	15 (26.3%)
Small cell carcinoma	5 (8.8%)
Adenosquamous carcinoma	2 (3.5%)
Large cell carcinoma	1 (1.8%)
SMARCA-4 deficient undifferentiated tumor	1 (1.8%)
Not classified	2 (3.5%)
Line of treatment / intended targeted treatment	
1 line	13 (22.8%)
2 line	15 (26.3%)
3 line	29 (50.9%)

Note: Histology categories are not mutually exclusive: one patient had both squamous and adenocarcinoma histology, and one patient had transformation from adenocarcinoma to small cell carcinoma. Mean age is calculated from patients with documented numeric age.

Results

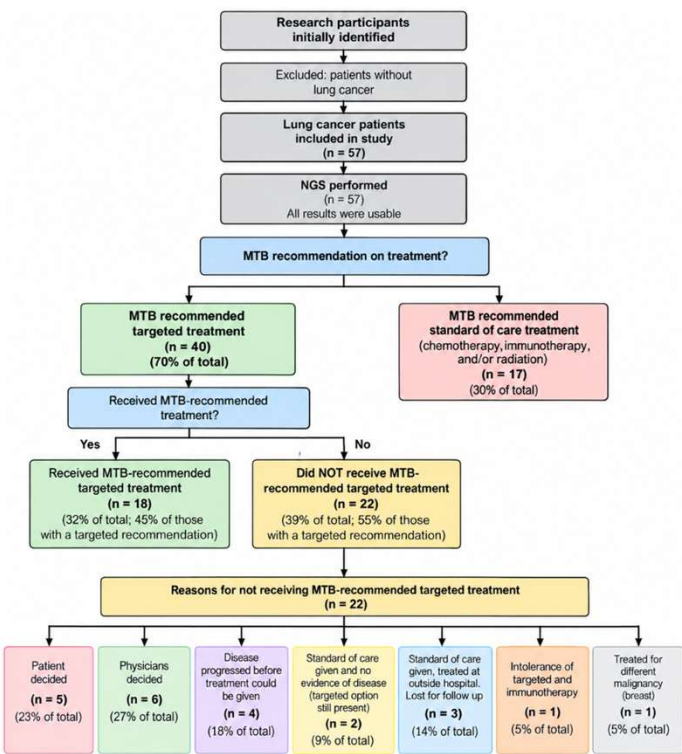


Figure 1. Flowchart of MTB Recommendations and Treatment Implementation. Flowchart depicting the progression from MTB evaluation and treatment recommendation to treatment implementation or non-implementation.

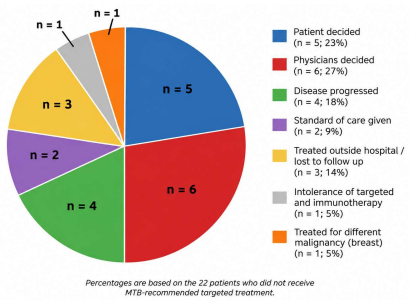


Figure 2. Reasons for Non-implementation of MTB-Recommended Targeted Therapy.

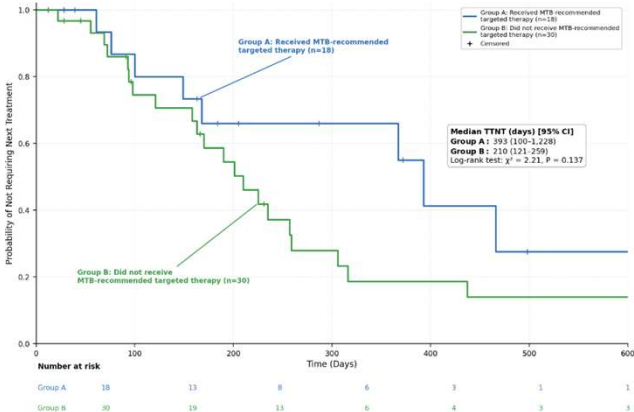


Figure 3. Kaplan-Meier Curves for Time to Next Treatment among patients who received MTB-recommended targeted therapy compared with those who did not. TTNT was calculated from the initiation of the relevant treatment to the initiation of the subsequent treatment; patients without a subsequent treatment were censored at the last available follow-up date. Time 0 = start of treatment. The difference between groups was evaluated using the log-rank test (P = 0.137).

Median TTNT was 393 days in Group A and 210 days in Group B. Kaplan-Meier analysis demonstrated no statistically significant difference in TTNT between groups (log-rank P=0.137). On unadjusted Cox regression, Group A had a lower hazard of subsequent treatment compared with Group B (HR 0.56, 95% CI 0.26–1.22; P=0.142), although this was not statistically significant.

Conclusion

Although MTB evaluation identified targeted treatment options for many patients, fewer than half (45%) of those with targeted treatment recommendations received the recommended therapy. Documented barriers to implementation included physician and patient decisions, disease progression, treatment at outside institutions, and treatment intolerance. Receipt of MTB-recommended targeted therapy was not associated with significantly longer TTNT, although the relatively small sample size and retrospective design limit the ability to detect differences between groups. These findings highlight a gap between molecular tumor board recommendations and treatment implementation. Future studies should evaluate barriers to implementation in a larger patient cohort and investigate strategies that address these barriers.

References

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