

Impact of Ground Glass Opacity on Differentiating Between Multiple Primary Lung Cancer vs Intrapulmonary Metastasis in a 1,600-Patient Cohort

Poster#
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Bishoy Yacoub, BS¹; Storm Alexander, BS¹; Brian Housman, MD¹; Emanuela Taioli, MD, PhD^{1,2,4}; Raja M. Flores, MD¹; Stephanie Tuminello, PhD^{1,2}

¹ Department of Thoracic Surgery, Icahn School of Medicine at Mount Sinai
² Institute for Translational Epidemiology, Icahn School of Medicine at Mount Sinai
³ Department of Surgery, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand; ⁴ Pharmacoepidemiology and Statistics Research Center (PESRC), Faculty of Pharmacy, Chiang Mai University; ⁵ Clinical Epidemiology and Clinical Statistic Center, Faculty of Medicine, Chiang Mai University
⁶ Tisch Cancer Institute, Icahn School of Medicine at Mount Sinai

BACKGROUND

- Distinguishing multiple primary lung cancers (MPLC) from intrapulmonary metastasis (IPM) determines staging, treatment strategy, and eligibility for repeat surgery.
- Surgical resection is standard for primary tumors, whereas metastatic disease is managed as advanced cancer.
- Current classification is largely based on Martini and Melamed (1975) criteria, which rely on tumor morphology and timing. These criteria predate modern imaging and may not fully capture tumor heterogeneity.
- Advances in genomic sequencing show that tumors within the same patient can be as genetically distinct as those between individuals.
- Ground-glass opacity (GGO) on CT is associated with lepidic growth and early adenocarcinoma, and is often interpreted as a marker of new primary tumors.

OBJECTIVE

- Determine whether applying an explicit ground-glass opacity (GGO) rule changes MPLC vs IPM classification in patients undergoing a second lung cancer resection.

Hypothesis:

- We believe that use of the GGO rule would result in a net shift in classification, reflecting the possibility that subsolid features represent aerogenous dissemination rather than independent primary tumors.

METHODS

Design & population

- Single-center retrospective cohort (2012–2022)
- 1,633 patients underwent curative lung cancer resection
- 91 patients (5.6%) underwent a second resection

Analysis

- Compared classification before vs after GGO rule
- Quantified reclassification patterns

Classification

- Initial: MPLC vs IPM using standard clinicopathologic criteria
- Reclassified using a prespecified **GGO rule**

GGO rule

- Ground-glass or part-solid lesion with GGO (radiology)
- Lepidic-predominant or noninvasive tumor (pathology)
- Applied regardless of timing or histologic similarity

RESULTS

Ground Glass Opacities NOT in Diagnostic Criteria (Original Criteria)	Ground Glass Opacity in Diagnostic Criteria			
	Type of Tumor	Intrapulmonary Metastasis	Multiple Primary Lung Cancers	Total
	Intrapulmonary Metastasis	28	5	33
	Multiple Primary Lung Cancers	10	48	58
	Total	38	53	91

Effect of Ground-Glass Opacity on MPLC vs IPM Classification

Second resections: 91 / 1,633 patients (5.6%)

Reclassification:

- 15 / 91 cases (16%) changed classification
- 10 MPLC → IPM
- 5 IPM → MPLC

Final classification:

- 53 MPLC (58%)
- 38 IPM (42%)

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AI DISCLOSURE

ChatGPT (OpenAI) was used to assist with editing, organization, and refinement of presentation content. All scientific content, analyses, interpretations, and conclusions were reviewed and verified by the authors.

CONCLUSION

- Incorporating ground-glass opacity meaningfully alters MPLC vs IPM classification
- Reclassification occurs in a clinically relevant proportion of patients (16%)
- Findings support that subsolid features may represent aerogenous dissemination rather than independent primaries.

CLINICAL RELEVANCE

- MPLC vs IPM classification directly affects:
 - Cancer staging
 - Eligibility for repeat surgery
 - Systemic vs local therapy decisions
- Integrating GGO into classification may:
 - Improve diagnostic consistency
 - Reduce misclassification
 - Support more informed multidisciplinary decision-making

RECOMMENDATIONS

- Standardize radiology reporting language for GGO
- Incorporate GGO into tumor board workflows
- Use an integrated classification approach:
 - Histology
 - Imaging features
 - Selective genomics when clinically relevant

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