



P1.213: Occult Pulmonary Metastasis and Its Predictors in c-Stage IA Lung Cancer: Implications for Surgical Decision-Making

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IASLC 2026 World
Conference on Lung Cancer

SEPTEMBER 12 - 15, 2026
SEOUL, REPUBLIC OF KOREA

INTRODUCTION

- ✓ Based on evidence supporting the efficacy of sublobar resection for small peripheral lung cancer, it is now being widely adopted in clinical practice despite a concern of the increased risk of local recurrence.
- ✓ Spread through air spaces (STAS) has been reported as tumor-related factors potentially associated with the risk of local recurrence after sublobar resection^{1,2}. While, some studies have reported comparable outcomes between segmentectomy vs lobectomy in patients with occult LN metastasis (Figure 1)³⁻⁵.
- ✓ In clinical practice, small pulmonary metastases (PM), which were not recognized on preoperative imaging, are occasionally identified on postoperative pathological examination. However, the incidence of such occult PM (oPM) in routine clinical practice, their predictive factors, and their potential impact on the choice of surgical procedure remain unclear.

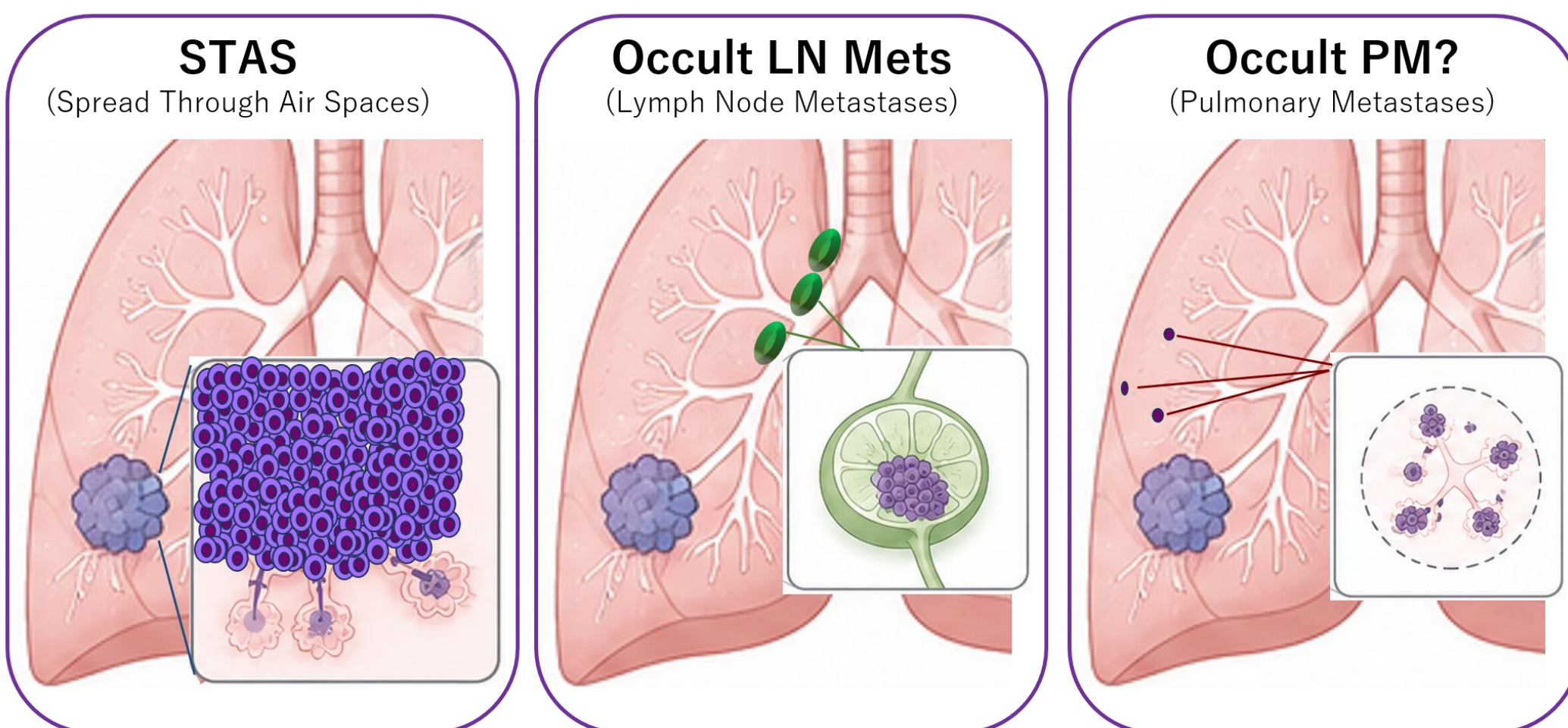


Figure 1. Summary of high-risk factors that cannot be determined preoperatively.

METHODS

- ✓ We retrospectively analyzed 711 patients with clinical stage IA lung cancer who underwent pulmonary resection at our institution between 2018/4 – 2026/2.
- ✓ Clinical and pathological data were compared between patients with and without oPM to identify potential predictive factors.
- ✓ Statistical analyses were performed using EZR, which is a modified version of R commander designed to add statistical functions frequently used in biostatistics⁶. Categorical variables were compared using the Fisher's exact test. Survivals were estimated by the Kaplan–Meier method.

CONCLUSION

- The incidence of oPM in clinical stage IA lung cancer was 0% in tumors with GGO and was approximately 2-3% in pure-solid tumors.
- Although elevated tumor markers may predict higher risk of oPM, its incidence remained 5–6%, suggesting that oPM may not influence the choice of surgical procedure.
- Patients with oPM, particularly those with lymphatic invasion, had high risk of recurrence. Identification of oPM via detailed pathological examination will lead to accurate staging and appropriate adjuvant treatment.

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ACKNOWLEDGEMENTS

Artificial Intelligence (AI) Use Disclaimer

During the preparation of this poster, we have used an AI-assisted language tool to assist with correction of grammar, spelling, and writing style. An AI tool was also used to create some components of Figure 1. After using these tools, we reviewed and edited the content as needed and take full responsibility for the content of this poster.

Funding information
None.

RESULTS

(1) Frequencies of oPM

Among 711 patients in our cohort, oPM was detected in 12 patients (1.7%, Figure 2), including lung adenocarcinoma (N = 5), squamous cell carcinoma (N = 4), adenosquamous carcinoma (N = 1), large cell carcinoma (N = 1), and SCLC (N = 1). Because no patient with part-solid tumor on preoperative CT had oPM, subsequent analyses were restricted to those with pure-solid tumors. Typical cases with oPM are shown in Figure 3.

(2) Clinical predictive factors for oPM

Among 711 patients, oPM was significantly associated with elevated CEA levels (5.6% vs 1.4%, $p = 0.017$), and a trend toward higher incidence was observed in patients with elevated CYFRA levels (6.1% vs 2.0%, $p = 0.073$; Table 1). The SUVmax of the primary tumor was not a significant predictor of oPM.

(3) Survival outcomes in patients with oPM

Recurrence-free survivals were worse in oPM+ subgroup, especially in those with ly+, among patients who were upstaged to pStage II-III after surgery (Figure 4).

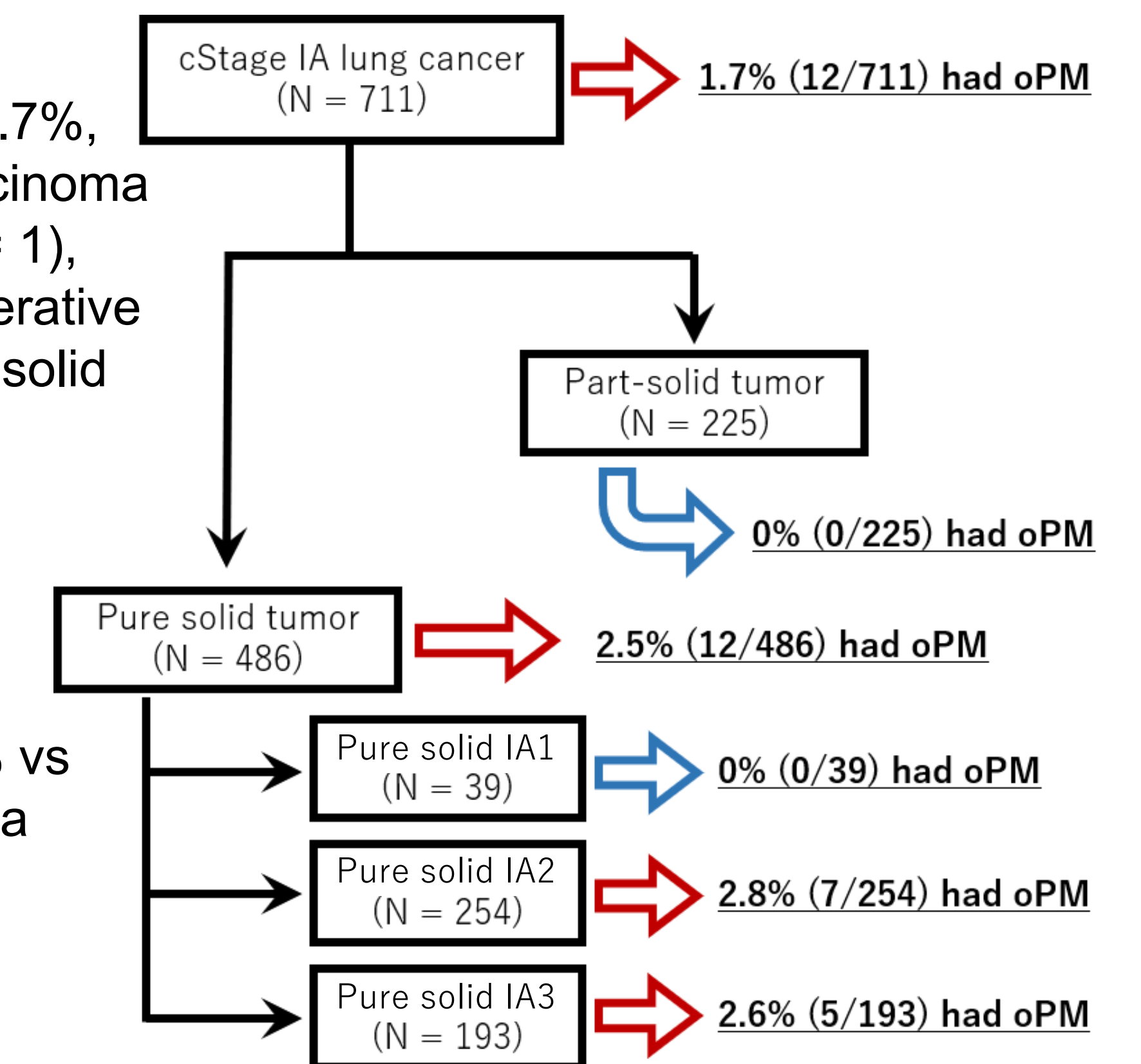
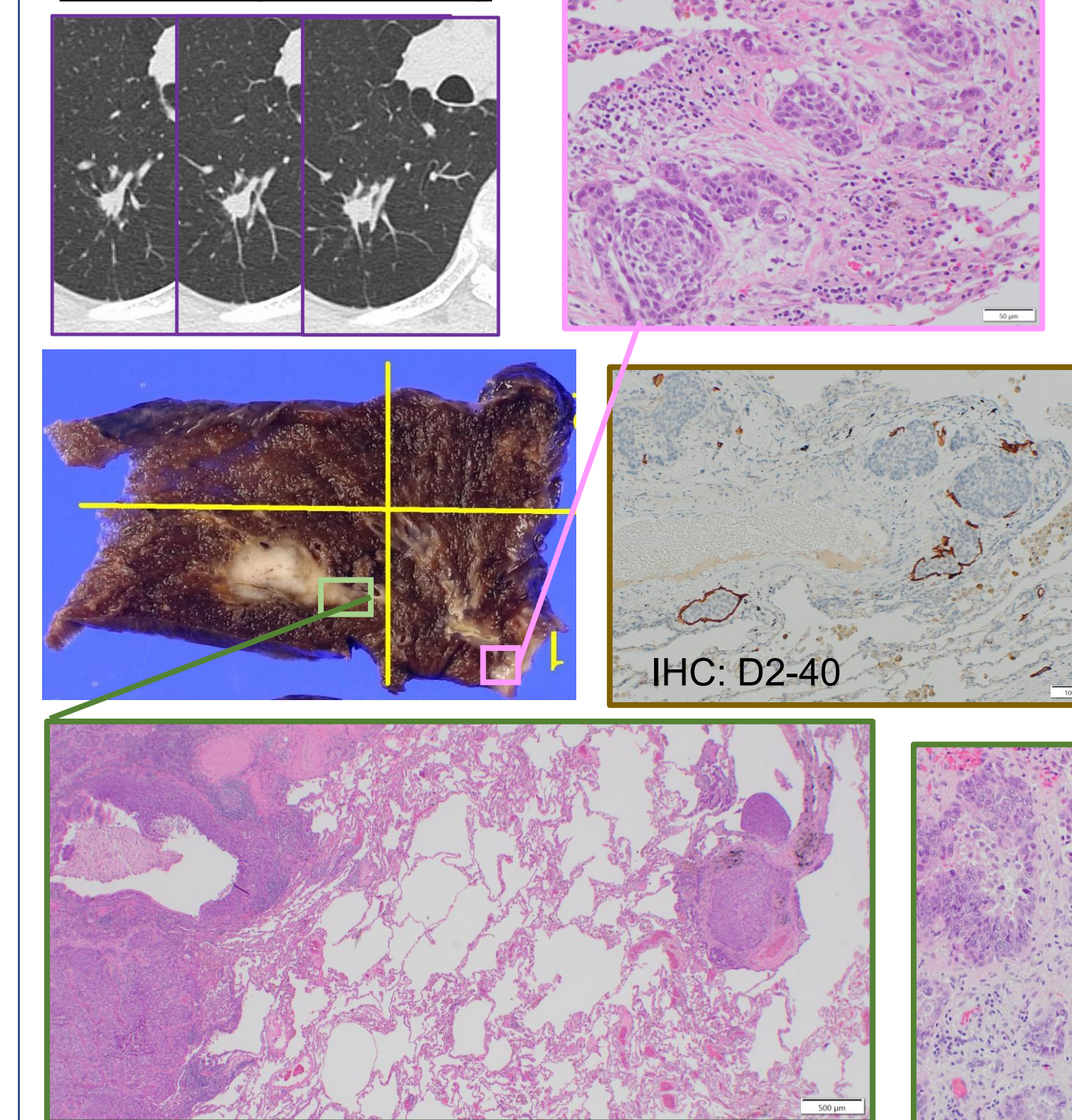


Figure 2. Frequencies of oPM based on CT appearance and tumor size.

Case 1 (60M, SQ)



Case 2 (78M, AD with EGFR mut)

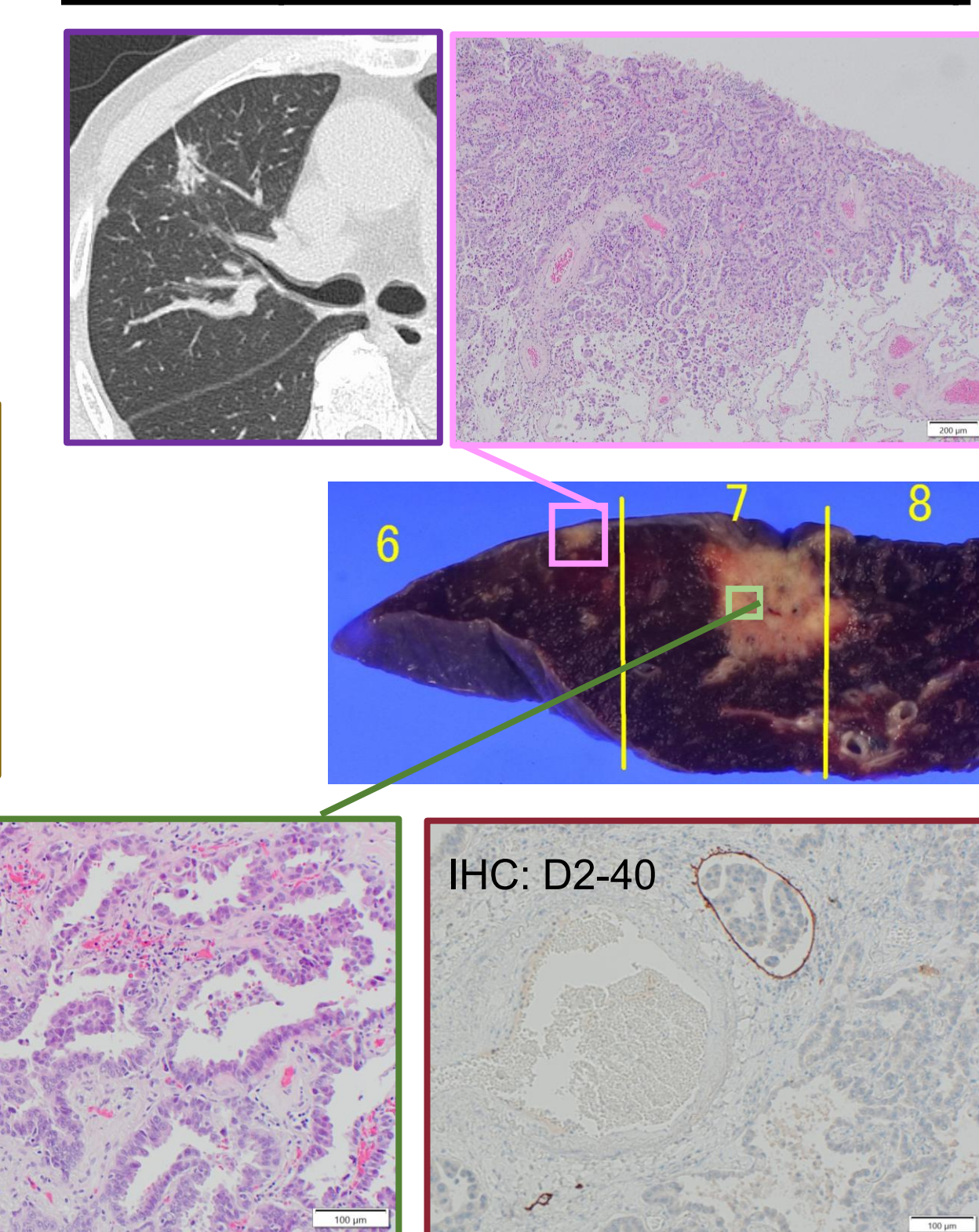


Figure 3. Typical cases with oPM. Both cases showed massive lymphatic invasion.

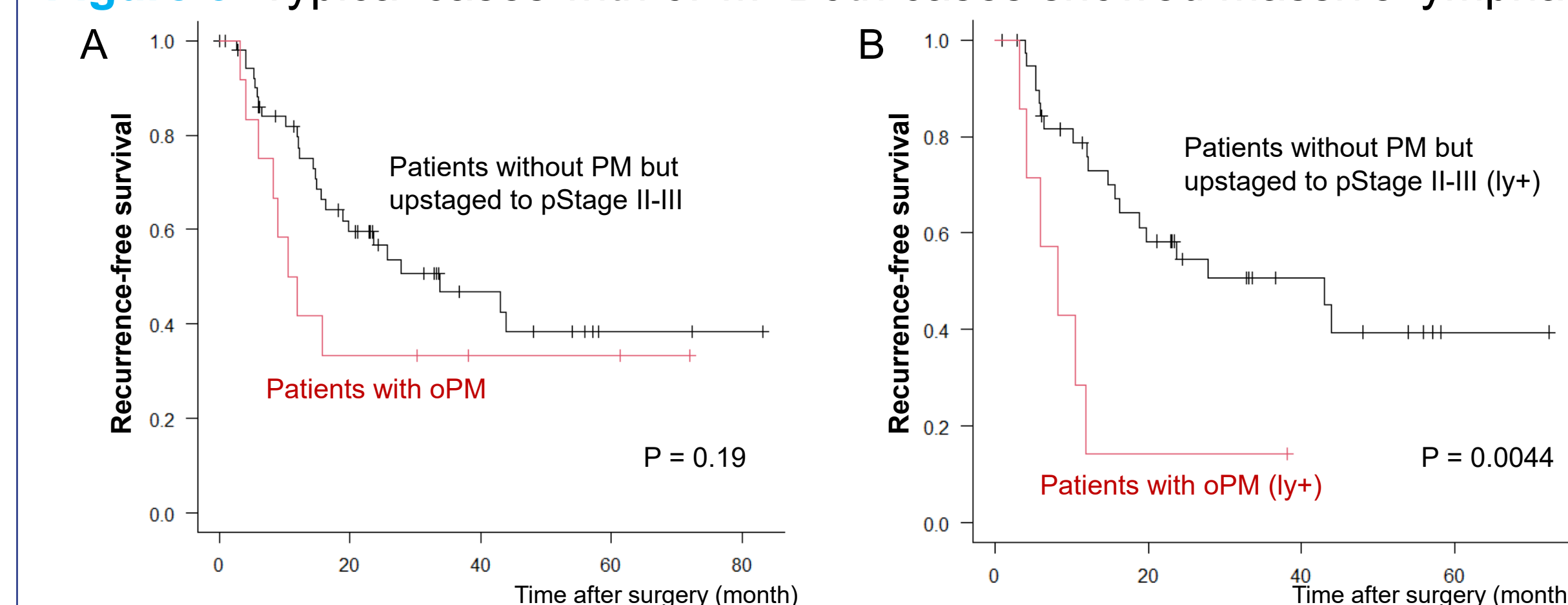


Figure 4. Survival outcomes in cStage IA / pStage II-III patients based on PM status.

Table 1. Incidence of oPM in each subgroup

Clinical Factors	% of occult PM	p-value
Sex		0.065
Male	3.5% (11/317)	
Female	0.6% (1/169)	
Age (year-old)		0.56
>75	3.0% (7/230)	
≤75	2.0% (5/256)	
Smoking status		1
Yes	2.7% (9/339)	
No	2.3% (3/128)	
SUVmax		0.20
>5.0	4.6% (7/151)	
≤5.0	1.8% (3/169)	
CEA (ng/mL)		0.017
>5.0	5.6% (7/125)	
≤5.0	1.4% (5/355)	
CYFRA (ng/mL)		0.073
>3.5	6.1% (4/66)	
≤3.5	2.0% (8/405)	
ProGRP (pg/mL)		1
>75	2.5% (3/120)	
≤75	2.7% (9/335)	
D-dimer (ug/mL)		0.13
>1.0	3.1% (3/97)	
≤1.0	0.8% (2/253)	
Histology		0.039
AD	1.5% (5/334)	
SQ	3.6% (4/110)	
Others	7.1% (3/42)	