



EP07.42 Oncologic Outcomes of Sublobar Resection in Non–Small Cell Lung Cancer ≤3 cm With Adverse Pathologic Features



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INTRODUCTION

- Lobectomy has long been the standard operation for early-stage NSCLC, but JCOG0802 and CALGB140503 established sublobar resection as a valid option for selected small peripheral tumours.
- Concerns persist about the oncologic adequacy of limited resection when a tumour shows aggressive pathology — **visceral pleural invasion (VPI), spread through air spaces (STAS)** and **high-grade histology**.
- Each feature is consistently linked to recurrence, yet most studies assessed them one at a time — while patients frequently harbour several of them at once.

Objective

To determine whether the extent of resection is associated with recurrence-free survival (RFS) in cN0M0 NSCLC ≤3 cm harbouring VPI, STAS or high-grade histology — individually and in combination.

METHODS

Design. Single-centre retrospective cohort, Seoul National University Hospital (IRB E-2605-051-1742).

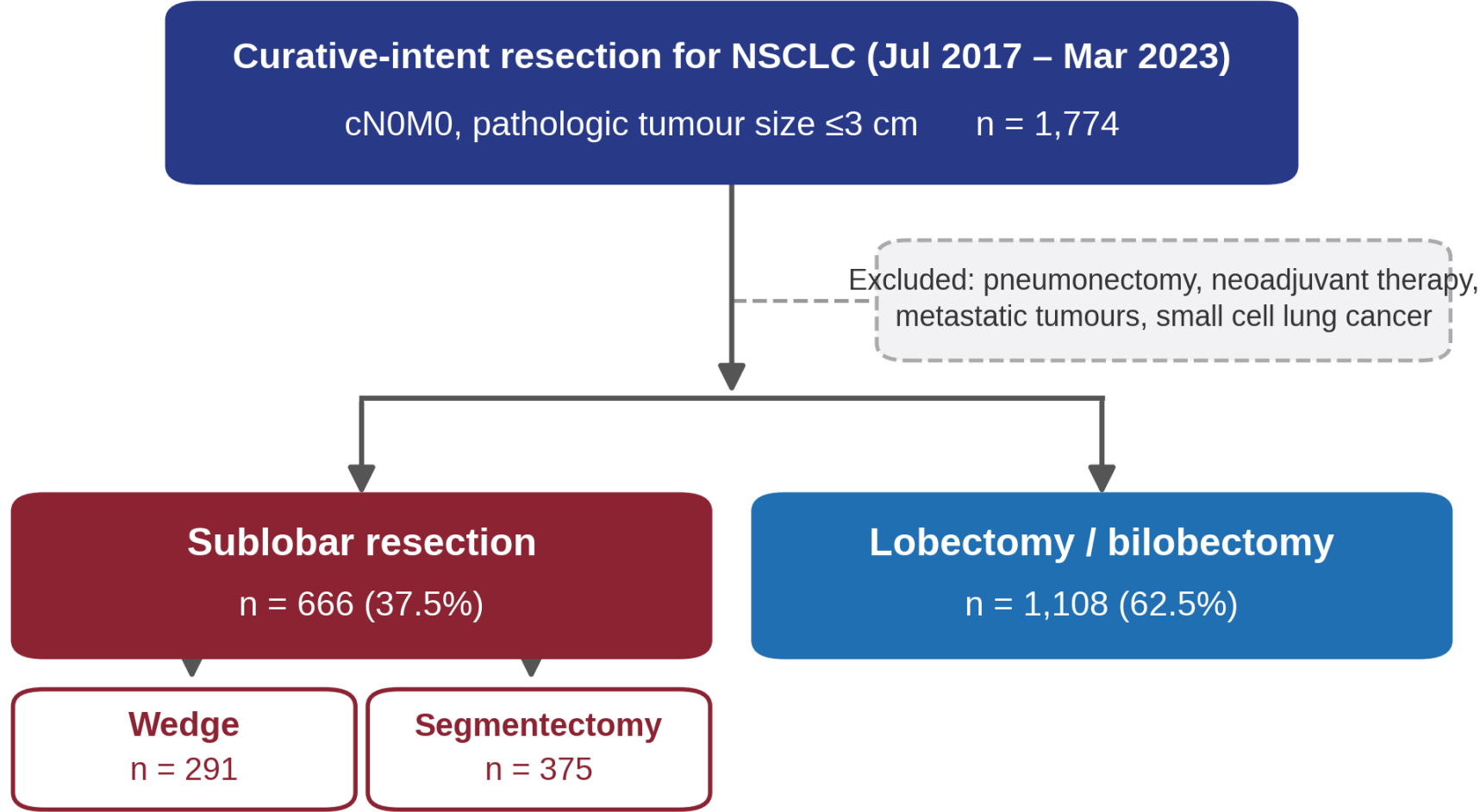
Population. Curative-intent resection for NSCLC, July 2017 – March 2023; cN0M0 with pathologic tumour size ≤3 cm. Excluded: pneumonectomy, neoadjuvant therapy, pulmonary metastases, small cell carcinoma.

Groups. Sublobar resection (wedge + segmentectomy) versus lobectomy (including bilobectomy).

Adverse features. VPI (PL1, beyond the elastic layer; PL2, to the pleural surface — both VPI-positive), STAS, and high-grade histology.

Endpoint. RFS — surgery to recurrence or death from any cause; first recurrence classified as locoregional or distant.

Analysis. Kaplan–Meier with log-rank test and Cox proportional hazards regression (nodal status as N0 / NX / N+). IPTW propensity scores used preoperative variables only (age, sex, smoking, radiologic size, C/T ratio, with quadratic and interaction terms); balance judged by standardised mean difference <0.1. Sensitivity analyses: pN0 cohort, and segmentectomy versus lobectomy.



DISCUSSION AND CONCLUSION

Key findings

- Resection extent was **not** independently associated with RFS (adjusted HR 1.17, 95% CI 0.69–1.98), whereas VPI, STAS and high-grade histology each were.
- IPTW-weighted RFS curves showed no clear separation between sublobar resection and lobectomy in any adverse-feature subgroup, alone or combined.
- Findings were unchanged in the pN0 cohort and for segmentectomy versus lobectomy (HR 1.18, 0.57–2.46).
- Margins were shorter after wedge resection, yet recurrence was no more frequent than after segmentectomy.

Interpretation

- Aggressive tumour biology appears to weigh more heavily on recurrence risk than the extent of parenchymal resection in tumours ≤3 cm.

Cautions

- Retrospective and single-centre; IPTW reduces but cannot remove residual confounding.
- Few events in multiple-feature subgroups — absence of a significant difference is **not** evidence of equivalence.
- Nodal assessment was absent (NX) in 24.6% of sublobar versus 0.4% of lobectomy patients — possible stage migration.
- These features are known only after resection, so the results do not translate directly into preoperative decisions.

Conclusion

Adverse pathologic features — not the extent of resection — were associated with recurrence. They alone may not identify patients who benefit from escalation to lobectomy; prospective validation is required.

REFERENCES & ACKNOWLEDGEMENTS

- Saji H, et al. Lancet 2022;399:1607–17.
- Altorki N, et al. N Engl J Med 2023;388:489–98.
- Wang T, et al. Sci Rep 2017;7:1527.
- Chen D, et al. Ann Thorac Surg 2019;108:945–54.
- Hegedűs F, et al. Histopathology 2024;85:51–61.
- Ruan Y, et al. World J Surg Oncol 2024;22:302.
- Nagase W, et al. Cancers (Basel) 2025;17:3382.
- Altorki N, et al. JAMA Oncol 2024;10:1179–86.
- akha S, et al. Chest 2014;146:1619–26.
- Mikubo M, et al. Lung Cancer 2024;187:107445.
- Belker E, et al. Cancers (Basel) 2026;18:604.
- Kadota K, et al. Am J Surg Pathol 2019;43:1033–41.
- Jiang L, et al. Chest 2015;148:903–11.
- Wang S, et al. Clin Lung Cancer 2019;20:e584–91.
- Laville D, et al. Am J Surg Pathol 2024;48:596–604.

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RESULTS

1,774
patients with cN0M0 NSCLC ≤3 cm

666 vs 1,108
sublobar resection vs lobectomy

HR 1.17 (0.69–1.98)
lobectomy vs sublobar (P = 0.562)

2.50 / 2.00 / 1.89
adjusted HR: VPI / STAS / high-grade

Table 1. Clinicopathologic characteristics

Variable	Sublobar (n = 666)	Lobectomy (n = 1,108)	P
Age, years	64.2 ± 10.0	64.4 ± 9.2	0.627
Male sex	335 (50.3%)	538 (48.6%)	0.508
Radiologic size, cm	1.6 ± 0.6	2.1 ± 0.7	<0.001
Part-solid nodule	509 (76.4%)	539 (48.6%)	<0.001
C/T ratio	0.5 ± 0.4	0.7 ± 0.3	<0.001
Pathologic size, cm	1.5 ± 0.6	1.9 ± 0.6	<0.001
pN0	484 (72.7%)	1,026 (92.6%)	<0.001
pN+	18 (2.7%)	78 (7.0%)	
pNX	164 (24.6%)	4 (0.4%)	
Visceral pleural invasion	47 (7.1%)	261 (23.6%)	<0.001
STAS	99 (14.9%)	387 (34.9%)	<0.001
High-grade histology	25 (3.8%)	135 (12.2%)	<0.001

Figure 1. Adjusted hazard ratios for recurrence-free survival

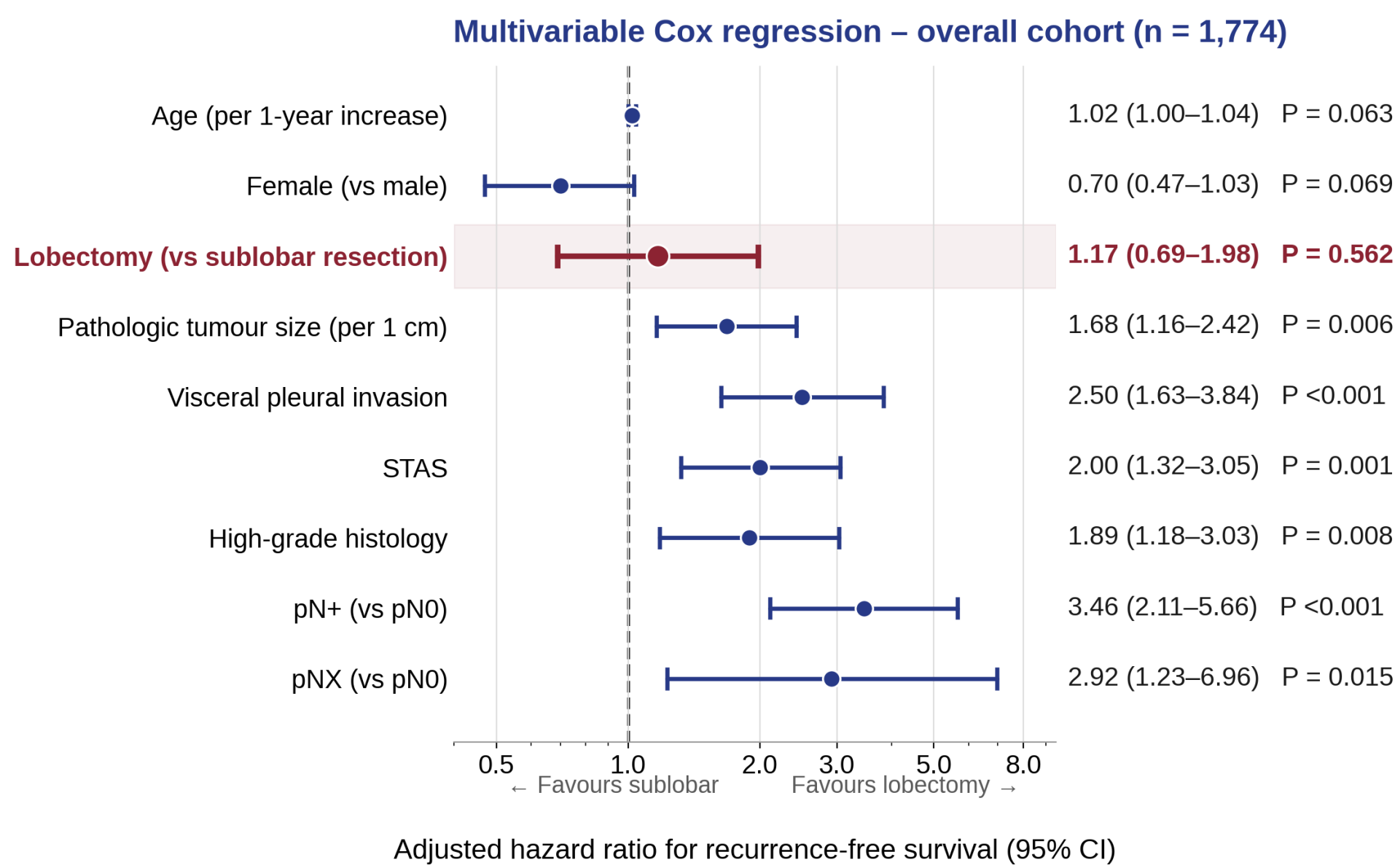


Figure 2. IPTW-weighted RFS by extent of resection — (A) visceral pleural invasion, (B) STAS, (C) high-grade histology

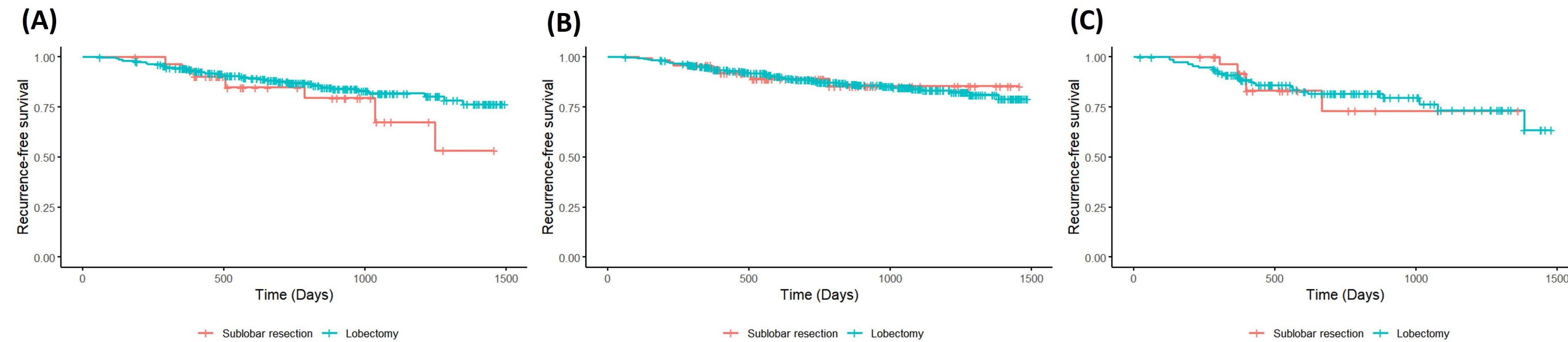


Figure 3. Combined adverse features: (A) VPI + STAS, (B) VPI + high-grade, (C) STAS + high-grade, (D) all three

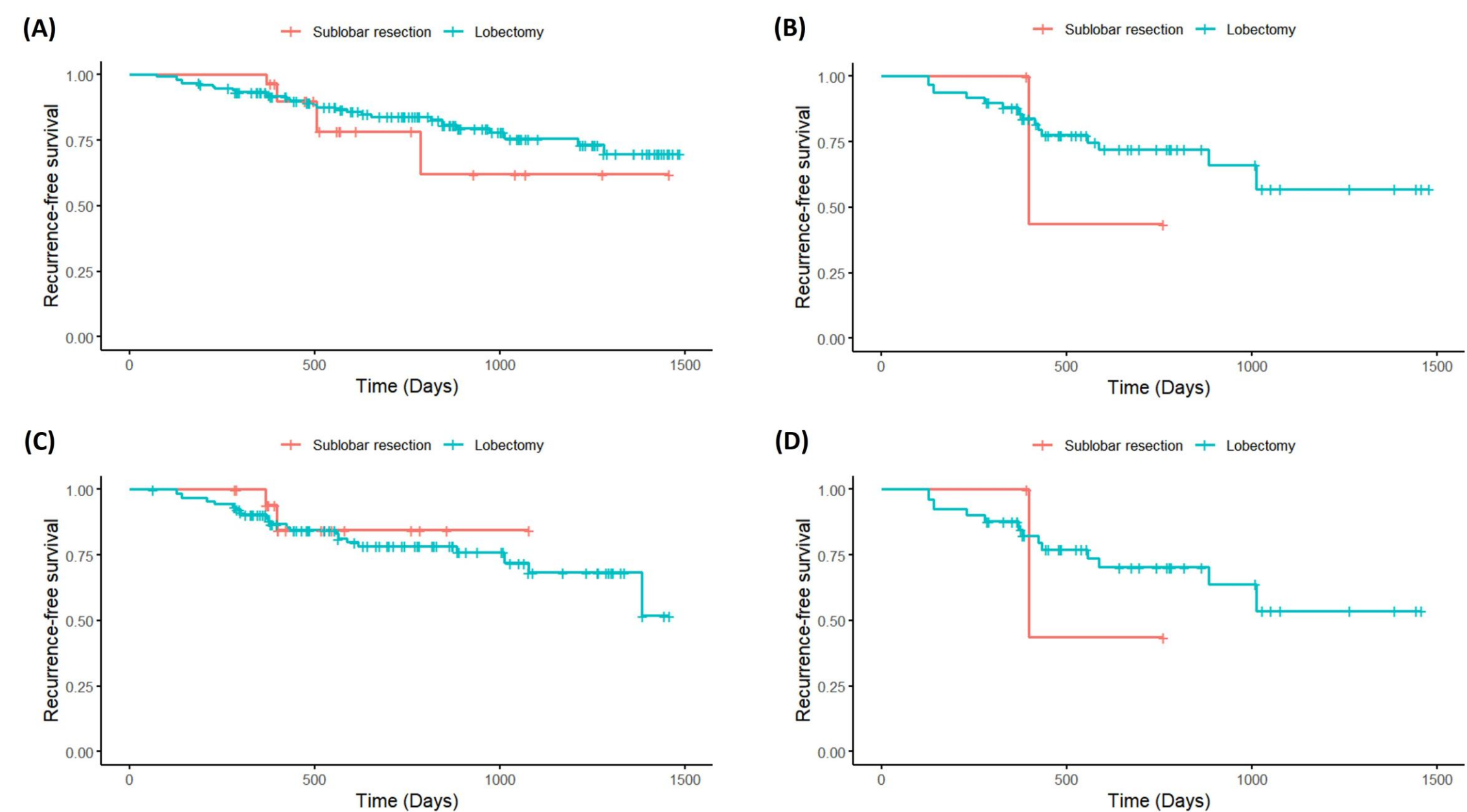


Table 2. Recurrence patterns

First recurrence	Sublobar (n = 666)	Lobectomy (n = 1,108)	P
Any recurrence	24 (3.6%)	82 (7.4%)	0.002
Locoregional	15 (2.3%)	45 (4.1%)	0.668
Distant	9 (1.4%)	37 (3.3%)	0.668
Within sublobar	Wedge (n = 291)	Segmentectomy (n = 375)	P
Any recurrence	11 (3.8%)	13 (3.5%)	0.995
Locoregional	8 (2.7%)	7 (1.9%)	0.597
Distant	3 (1.0%)	6 (1.6%)	0.597

Parenchymal resection margin

Wedge 1.2 ± 0.8 cm vs segmentectomy 2.4 ± 1.6 cm (P < 0.001) — yet recurrence after wedge resection was not more frequent than after segmentectomy.