



Real-World Outcomes and AI Prediction of pCR in Stage II-III NSCLC Treated With Perioperative Immunochemotherapy

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INTRODUCTION

- Neoadjuvant immunotherapy has demonstrated substantial clinical benefits in resectable non–small cell lung cancer (NSCLC), yet reliable tools for individualized response prediction remain limited.
- We conducted a real-world study to evaluate surgical, pathological, and survival outcomes in patients with resectable NSCLC treated with neoadjuvant immune-based regimens followed by resection.
- Furthermore, we developed and validated a clinicopathologic artificial intelligence (AI) model to predict pathological complete response (pCR) and support personalized perioperative treatment decision-making.

STUDY DESIGN

Key Inclusion Criteria:

- Age ≥ 18 years
- Resectable II-IIIB stage NSCLC (AJCC V9)
- Negative for driver mutations (EGFR/ALK)

Neoadjuvant Phase Immuno-chemotherapy

- PD-1/L1 antibody
 - Platinum-based doublet chemotherapy
- Q3W, for 3–6 cycles

Surgery

Adjuvant Phase: Immunotherapy monotherapy

PD-1/L1 antibody for 1 year

RESULTS

Between Jan 2019 and Aug 2025, 110 pts were included.

Table 1: Patient characteristic

Characteristic	n (%) N=110
Age (years) Median (range)	68 (48–82)
Male	93 (84.6%)
Current/Former smoker	83 (75.5%)
ECOG performance status	
0	60 (54.5%)
1	48 (43.6%)
T stage	
T1	14 (12.7%)
T2	43 (39.1%)
T3	25 (22.7%)
T4	25 (22.7%)
Tx	3 (2.7%)
N stage	
N0	10 (9.1%)
N1	7 (6.4%)
N2a	78 (70.9%)
N2b	9 (8.2%)
N3	3 (2.7%)
Nx	3 (2.7%)
AJCC staging	
II	12 (10.9%)
III	98 (89.1%)
Histology	
Squamous cell carcinoma	82 (74.5%)
Non-squamous carcinoma	28 (25.5%)

Fig 1: Treatment Exposure

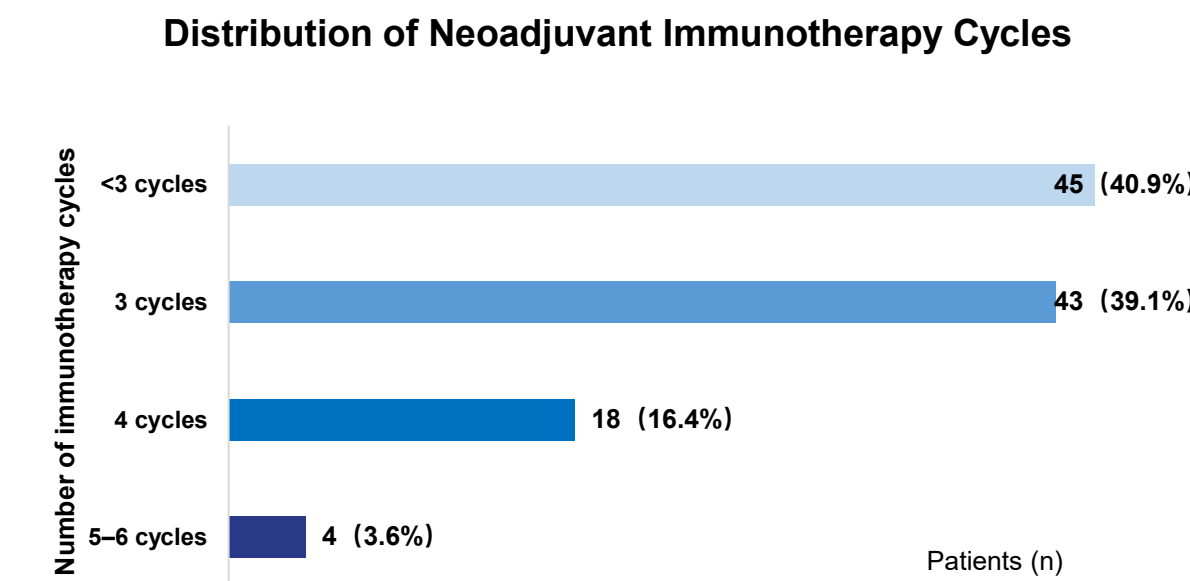
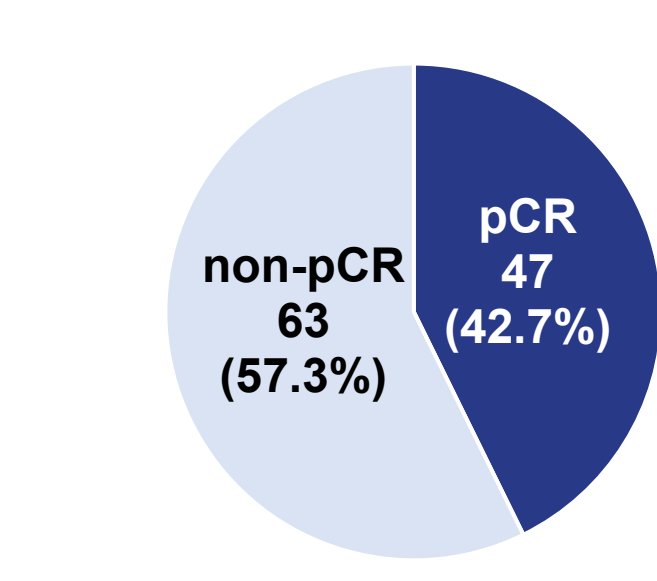


Fig 2: Pathologic Response



The median follow-up duration was 22.5 months.

Fig 3: EFS and OS in the Overall Population

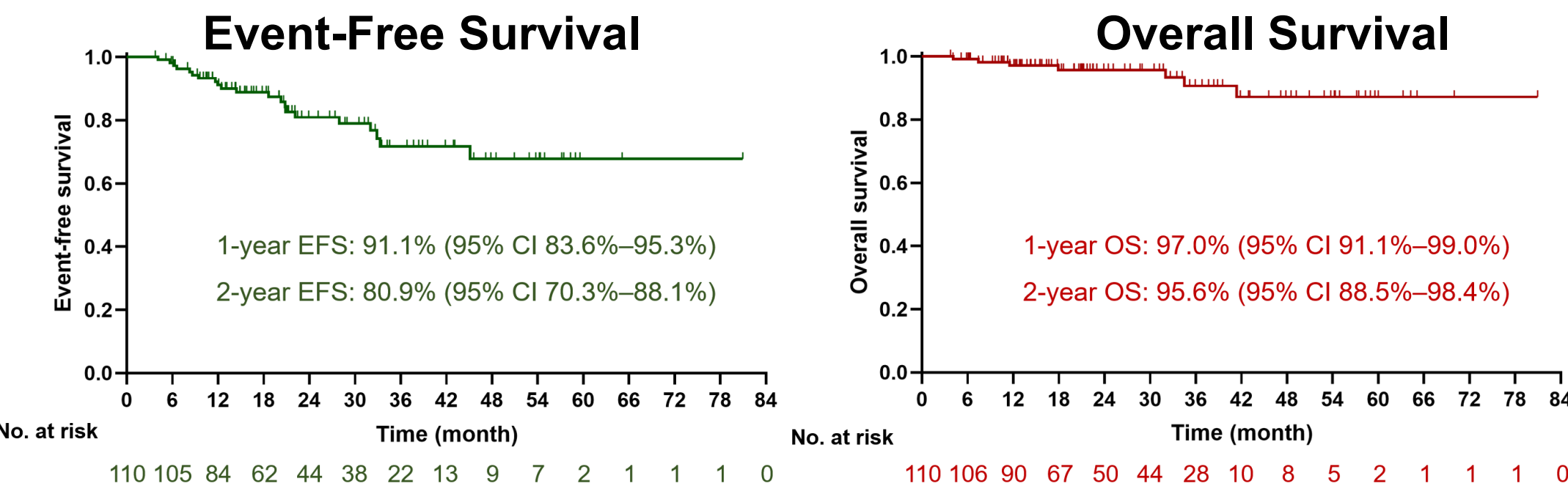
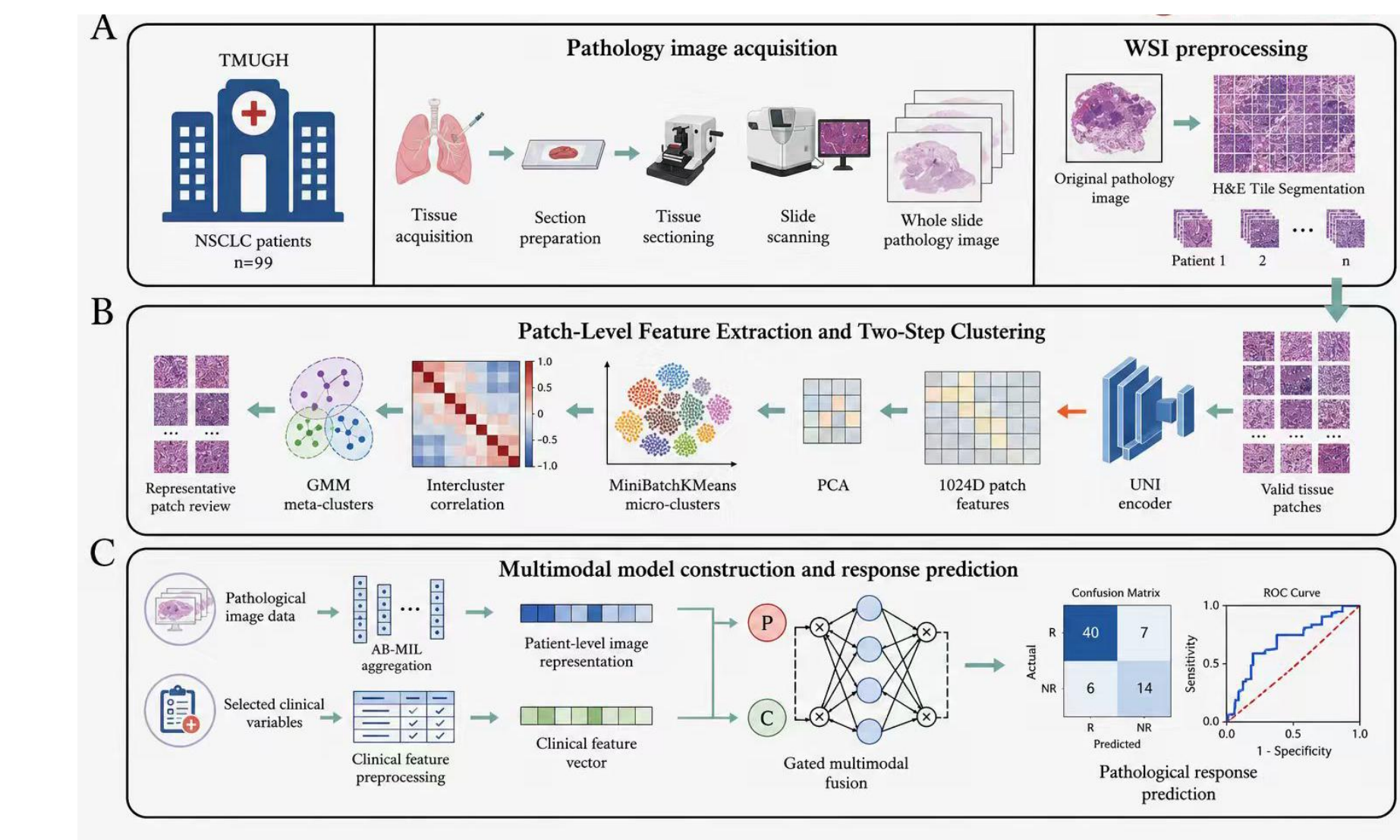


Table 2. Treatment-Related Adverse Events by Stage

Treatment Stage	All-grade	Grade ≥ 3
Neoadjuvant	68.6%	9.1%
Surgical	10.0%	0.0%
Adjuvant	82.2%	13.6%

Fig 4. Multi-instance learning model based on attention mechanism



An integrated H&E image-clinical model predicted neoadjuvant treatment response with AUCs of 0.85 (training) and 0.83 (validation).

CONCLUSION

- Neoadjuvant immunochemotherapy achieved robust radiologic and pathological responses, high rates of minimally invasive surgery and R0 resection, and encouraging survival outcomes in resectable stage II–III NSCLC in real-world practice.
- A multimodal clinicopathologic AI model further showed promising performance for pCR prediction, supporting the integration of digital pathology and AI into perioperative treatment stratification.