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INPLASY

Prognostic Analysis of Lobectomy versus Sublobectomy in Patients with Stage I Non-Small Cell Lung Cancer: An umbrella review

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ADMINISTRATIVE INFORMATION

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 17 November 2025 and was last updated on 17 November 2025.

INTRODUCTION

Review question / Objective The primary objective of this umbrella review is to systematically identify, evaluate, and synthesize the evidence from existing meta-analyses that compare the oncological outcomes, perioperative safety, and complications of lobectomy versus sublobectomy (segmentectomy or wedge resection) in patients with stage I non-small cell lung cancer (NSCLC).

Condition being studied The optimal surgical approach for stage I non-small cell lung cancer (NSCLC) remains a subject of debate. While lobectomy is the established standard of care, sublobectomy (segmentectomy or wedge resection) is increasingly considered for smaller tumors to preserve lung function. Numerous meta-analyses have synthesized the existing evidence comparing these procedures; however, their conclusions are often inconsistent and sometimes conflicting. This lack of consensus creates uncertainty for clinicians and guideline developers.

METHODS

Participant or population Inclusion Criteria:
Diagnosis: Pathologically confirmed non-small cell lung cancer (NSCLC). All histological subtypes.
Disease Stage: Clinical or pathological stage I disease, as defined by the relevant TNM staging system.
Treatment Context: Patients undergoing surgical resection with curative intent.
Excluded
Exclusion Criteria:
Cell Type: Patients with small cell lung cancer (SCLC), carcinoid tumors, or metastatic lung tumors from other primary sites.
Disease Stage: Patients with stage II, III, or IV NSCLC.

Treatment History: Patients who have received neoadjuvant chemotherapy or radiotherapy prior to surgery.
Surgical Context: Studies focusing exclusively on palliative resections or emergent surgeries.
Pregnant patients.
Studies that exclusively focus on "very elderly" populations without providing comparative data for the broader adult population.

Intervention
Included
Excision Of Segment Of Lung; Single Wedge Excision Of Lung.

Comparator
Included
PICO tags selected: Lobectomy Of Lung.

Study designs to be included Included meta analysis including either randomized or nonrandomized study types.

Eligibility criteria
• Population: Adult patients (≥18 years) with pathologically confirmed stage I (IA-IB) NSCLC. Studies including mixed stages will be included only if stage I subgroup data is extractable.
• Intervention: Sublobectomy (including anatomical segmentectomy and wedge resection).
• Comparator: Lobectomy.
• Outcomes:
o Primary: Overall Survival (OS), Disease-Free Survival (DFS), Cancer-Specific Survival (CSS), Local/Regional/Distant Recurrence Rates.
o Secondary: Postoperative complications, 30-/90-day mortality, operative time, blood loss, length of hospital stay.
• Study Design: Systematic reviews and meta-analyses of randomized controlled trials (RCTs) and/or observational studies (e.g., cohort studies). Narrative reviews, editorials, and single primary studies will be excluded.

Information sources
A systematic search will be conducted in the following electronic databases from inception to the present date:
• PubMed/MEDLINE
• Embase
• Cochrane Database of Systematic Reviews (CDSR)
• Web of Science Core Collection.

Main outcome(s) Overall survival (OS) and disease-free survival (DFS).

Quality assessment / Risk of bias analysis The methodological quality of each included meta-analysis will be independently assessed by two reviewers using the AMSTAR-2 (A MeaSurement Tool to Assess systematic Reviews 2) and GRADE checklist. This tool provides a reliable critical appraisal of the conduct of systematic reviews.

Strategy of data synthesis
• Narrative Synthesis: A structured summary will be presented for each included meta-analysis, detailing its population, findings, quality, and heterogeneity.
• Re-analysis (if applicable and feasible): If multiple meta-analyses report data on the same outcome but with significant updates or differences in included studies, and if the primary study data are accessible, a new meta-analysis may be considered.
• Evidence Grading: The strength of the body of evidence for each primary outcome will be evaluated using an approach based on the GRADE (Grading of Recommendations Assessment, Development and Evaluation) framework, considering factors such as risk of bias, consistency, precision, and publication bias across the included meta-analyses.

Subgroup analysis
Stage I NSCLC Lobectomy Versus Sub-lobar resection- Overall Survival
Stage IA NSCLC Lobectomy Versus Sub-lobar resection - Overall Survival
Stage I NSCLC Lobectomy Versus Sub-lobar resection- Disease-Free Survival
Stage IA NSCLC Lobectomy Versus Sub-lobar resection - Disease-Free Survival
stage I.

Sensitivity analysis Several sensitivity analyses were performed to test the robustness of the pooled estimates.
First, we repeated all umbrella meta-analyses after excluding meta-analyses with critically low methodological quality on AMSTAR-2, retaining only those rated as high or moderate quality. In particular, where substantial overlap of primary studies was identified, only the most recent, methodologically strongest review was retained in the main analysis, and alternative models including the older, overlapping review were explored as a sensitivity check.
Second, we conducted analyses restricted to meta-analyses that reported hazard ratios (HRs) for overall survival and disease-free survival. A secondary analysis was performed to assess the impact of Effect size metrixs.

Third, we evaluated the influence of study design and population by restricting to meta-analyses focusing on stage I.

Language restriction English.

Country(ies) involved China.

Keywords Lung cancer; Stage I NSCLC; Lobectomy; Segmentectomy; Sublobar resection; Limited resection; Meta-analysis.

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