INPLASY PROTOCOL

Sublobar resection versus ablation for stage I non-small-cell lung cancer: a meta-analysis

Li, Y[1]; Yang, F[2]; Huang, YY[3].

Review question / Objective: Both sublobar resection (SR) and ablation can be used for treatment for stage I non-small-cell lung cancer (NSCLC). The goal of this meta-analysis was thus to more fully compare the relative clinical efficacy and safety of SR and ablation for the treatment of stage I NSCLC.

Condition being studied: The standard surgical type for the stage I NSCLC is lobectomy with systematic mediastinal lymphadenectomy. However, many patients are often elderly and have a history of atherosclerotic cardiovascular disease, pulmonary dysfunction, or comorbidities related with cigarette smoking. Thus, less invasive modalities are preferred for the treatment of these patients. Although survival after sublobar resection (SR) is usually inferior to lobectomy, the SR can preserve patients' pulmonary function. In addition, for stage I NSCLC with tumor ≤ 2 cm, SR produces similar survival to lobectomy. Nevertheless, there are still 20%-30% patients with stage I NSCLC do not undergo SR because of the poor performance status. Under this condition, the minimally invasive therapy is percutaneous ablation, which has emerged as the preferred therapeutic strategy for patients who are not to undergo SR. Although the outcomes of SR and ablation have been previous compared, most of the studies are retrospective in nature. A meta-analysis should be carried out to decrease the bias and increase the statistical power.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 20 January 2021 and was last updated on 20 January 2021 (registration number INPLASY202110075).

INTRODUCTION

Review question / Objective: Both sublobar resection (SR) and ablation can be used for treatment for stage I non-small-cell lung cancer (NSCLC). The goal of this meta-analysis was thus to more fully compare the relative clinical efficacy and safety of

SR and ablation for the treatment of stage I NSCLC.

Rationale: Pooled recurrence rates, patients' survival, complication rates, and post-operative hospital stay were used to compare the SR vs. ablation for stage I NSCLC.

Condition being studied: The standard surgical type for the stage I NSCLC is lobectomy with systematic mediastinal lymphadenectomy. However, many patients are often elderly and have a history of atherosclerotic cardiovascular disease, pulmonary dysfunction, or comorbidities related with cigarette smoking. Thus, less invasive modalities are preferred for the treatment of these patients. Although survival after sublobar resection (SR) is usually inferior to lobectomy, the SR can preserve patients' pulmonary function. In addition, for stage I NSCLC with tumor ≤ 2 cm, SR produces similar survival to lobectomy. Nevertheless, there are still 20%-30% patients with stage I NSCLC do not undergo SR because of the poor performance status. Under this condition, the minimally invasive therapy is percutaneous ablation, which has emerged as the preferred therapeutic strategy for patients who are not to undergo SR. Although the outcomes of SR and ablation have been previous compared, most of the studies are retrospective in nature. A meta-analysis should be carried out to decrease the bias and increase the statistical power.

METHODS

Search strategy: (((((radiofrequency[Title/Abstract]) OR (microwave[Title/Abstract])) OR (cryoablation[Title/Abstract])) OR (ablation[Title/Abstract])) AND (((((surgery[Title/Abstract]) OR (resection[Title/Abstract])) OR (Video assisted thoracoscopic surgery[Title/Abstract])) OR (VATS[Title/Abstract]))) AND ((lung cancer[Title/Abstract]) OR (NSCLC[Title/Abstract])).

Participant or population: Patients with stage I NSCLC.

Intervention: Patients who underwent SR.

Comparator: Patients who underwent ablation.

Study designs to be included: Studies eligible for inclusion were (a) randomized controlled trials (RCTs) or retrospective studies, (b) studies of patients with stage I NSCLC, (c) studies comparing SR and ablation as treatments for NSCLC. No language restrictions were imposed on the study search process. Studies that were (a) non-comparative studies, (b) animal or preclinical studies, or (c) review articles were excluded.

Eligibility criteria: Studies eligible for inclusion were (a) randomized controlled trials (RCTs) or retrospective studies, (b) studies of patients with stage I NSCLC, (c) studies comparing SR and ablation as treatments for NSCLC. No language restrictions were imposed on the study search process. Studies that were (a) non-comparative studies, (b) animal or preclinical studies, or (c) review articles were excluded.

Information sources: Cochrane Library, Embase, and PubMed databases were searched to select potentially relevant studies published as of November 2020.

Main outcome(s): Survival.

Additional outcome(s): Recurrence rates, complication rates, and post-operative hospital stay.

Data management: Two investigators independently compiled data including baseline study, baseline patient, and treatment-associated data from all studies included in the present analysis. Any inconsistencies were resolved through discussion with a third author.

Quality assessment / Risk of bias analysis: Two researchers independently conducted quality assessment. RCTs were evaluated using the Cochrane risk of bias tool, and evaluated bias in the selection, performance, detection, attrition, reporting,

and other biases. The 9-point Newcastle-Ottawa scale (NOS) was used to assess all non-RCTs, with a score of ≥ 6 points being indicative of high quality.

Strategy of data synthesis: All analyses were conducted using RevMan v5.3. The Mantel-Haenszel method was used to measure pooled odds ratios (ORs) and 95% confidence intervals (CIs) for dichotomous variables, while mean difference (MD) values and 95% CIs were used when analyzing continuous variables. Pooled survival duration was assessed based upon hazard ratios (HRs) and 95% CIs. The X2 and I2 tests were employed to assess study heterogeneity, with an I2 > 50% being consistent with significant heterogeneity. Fixed-effects models were used to analyze data affected by significant heterogeneity, while a random-effects model was otherwise used. Sensitivity and subgroup analyses were used to identify sources of heterogeneity, while the risk of bias was gauged using funnel plots.

Subgroup analysis: None.

Sensibility analysis: None.

Language: English.

Country(ies) involved: China.

Keywords: Sublobar resection; Ablation; Lung cancer; Meta-analysis.

Dissemination plans: We want to publish a meta-analysis.

Contributions of each author:
Author 1 - Yong Li - The author drafted the manuscript.
Author 2 - Fang Yang - The author provided statistical expertise.
Author 3 - Ya-Yong Huang - The author contributed to the development of the selection criteria, and the risk of bias assessment strategy.