

INPLASY PROTOCOL

To cite: Wang et al.
Comparison between coil and
hook-wire localization before
video-assisted thoracoscopic
surgery for lung nodules: a
meta-analysis. Inplasy protocol
202230128. doi:
10.37766/inplasy2022.3.0128

Received: 23 March 2022

Published: 23 March 2022

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Support: None.

**Review Stage at time of this
submission:** Preliminary
searches.

Conflicts of interest:
None declared.

Comparison between coil and hook-wire localization before video-assisted thoracoscopic surgery for lung nodules: a meta-analysis

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Review question / Objective: We aim to conduct a meta-analysis to compare the effectiveness and safety of coil and hook-wire localization methods for lung nodules.

Condition being studied: For the small and deep LNs, less than 10mm in diameter or more than 5mm PN-pleura distant, may lead to up to a 63% rate of conversion from VATS to thoracotomy due to failure to identify the LN. Therefore, preoperative localization of these nodules is very helpful for guiding VATS resection. Among the various localization materials, coil and hook-wire are most commonly used. Both of the two materials yielded similar highly successful localization rates (92%-99%) according to the previous meta-analyses. In the aspect of safety, hook-wire localization had the higher complication rate than coil localization. However, these rates were indirectly compared from the meta-analyses which only included single-arm studies. We still need to conduct the meta-analysis based on the comparative studies of coil versus hook-wire localization before VATS for LNs.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 23 March 2022 and was last updated on 23 March 2022 (registration number INPLASY202230128).

INTRODUCTION

Review question / Objective: We aim to conduct a meta-analysis to compare the effectiveness and safety of coil and hook-wire localization methods for lung nodules.

Rationale: At present, computed tomography (CT) screening for early-stage lung cancers has been routinely used worldwide. Therefore, lung nodules (LNs) are being detected more frequently. Approximately 62%-72% of LNs are malignant in patients with moderate-to-high risk of malignancy as established

based upon clinical-radiological findings. The standard diagnosis and treatment for potential malignant LNs is resection by video-assisted thoracic surgery (VATS).

Condition being studied: For the small and deep LNs, less than 10mm in diameter or more than 5mm PN-pleura distant, may lead to up to a 63% rate of conversion from VATS to thoracotomy due to failure to identify the LN. Therefore, preoperative localization of these nodules is very helpful for guiding VATS resection. Among the various localization materials, coil and hook-wire are most commonly used. Both of the two materials yielded similar highly successful localization rates (92%-99%) according to the previous meta-analyses. In the aspect of safety, hook-wire localization had the higher complication rate than coil localization. However, these rates were indirectly compared from the meta-analyses which only included single-arm studies. We still need to conduct the meta-analysis based on the comparative studies of coil versus hook-wire localization before VATS for LNs.

METHODS

Search strategy: (((coil) OR (microcoil)) AND (((hook wire) OR (hookwire)) OR (hook-wire))) AND ((lung) OR (pulmonary)) AND (localization)) AND ((nodule) OR (lesion)).

Participant or population: Patients with lung nodules.

Intervention: Coil localization.

Comparator: Hook-wire localization.

Study designs to be included: Inclusion criteria included:(a) Types of studies: comparative studies;(b) Diseases: patients with LNs;(c) Types of interventions: coil versus hook-wire localization before VATS; (d) Languages: not limited.Exclusion criteria included: (a) non-comparative studies; (b) studies without English title and/or abstract; (c) case reports, letters, and reviews.

Eligibility criteria: Inclusion criteria included:(a) Types of studies: comparative studies;(b) Diseases: patients with LNs;(c) Types of interventions: coil versus hook-wire localization before VATS;(d) Languages: not limited.Exclusion criteria included: (a) non-comparative studies; (b) studies without English title and/or abstract; (c) case reports, letters, and reviews.

Information sources: Relevant articles were searched in PubMed, Embase, Cochrane Library, Wanfang, and CINK.

Main outcome(s): Successful localization rate.

Additional outcome(s): Duration of localization, total complication rates, pneumothorax rates, lung hemorrhage rates, chest pain score, duration of VATS, and duration of wedge resection.

Data management: Two authors independently extracted the relative data from the included studies, and the divergences were resolved by the third author.

Quality assessment / Risk of bias analysis: The quality of included randomized controlled trials (RCTs) was assessed using the Cochrane collaboration risk-of-bias tool. The items of Cochrane risk of bias tool include performance, attrition, detection, selection, reporting, and other sources of bias. Each item has high, low, or unclear risk of bias. The quality of included observation studies were assessed using the Newcastle-Ottawa scale (NOS). The items of NOS include selection (4 points), comparability (2 points), and exposure (3 points). The high quality observation studies were considered if the NOS score \geq 7.

Strategy of data synthesis: RevMan v5.3 and Stata v12.0 software were used. Pooled odds ratios (ORs) with 95% confidence intervals (CIs) was calculated for dichotomous variables, and continuous variables were calculated by mean differences (MDs) with 95% CIs.

Heterogeneity was determined by the I² statistic and Q test. I² > 50% was defines as significant heterogeneity. Fixed effect model was initially used, and random effect model was used if the significant heterogeneity was found. Sources of heterogeneity were evaluated by sensitivity analysis, which was performed using the “leave one out” method. Subgroup analyses were performed based on the studies which focused on the ground glass nodules (GGNs). Egger test was used to evaluate publication bias. P < 0.05 was the threshold for publication bias significance.

Subgroup analysis: Yes.

Sensitivity analysis: Yes.

Language: English.

Country(ies) involved: China.

Other relevant information: None.

Keywords: Coil; Hook-wire; Lung nodule.

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

Contributions of each author:

Author 1 - Jian-Li Wang.

Author 2 - Feng-Fei Xia.

Author 3 - Yun Lu.