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INPLASY

CT-guided anchored needle versus hook-wire localization for pulmonary nodules: a meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 July 2025 and was last updated on 13 July 2025.

INTRODUCTION

Review question / Objective This meta-analysis aimed to compare the relative safety and efficacy of anchored needle and hook-wire-based approaches for pulmonary nodule localization.

Condition being studied The most accurate diagnostic technique for high-risk pulmonary nodules (PNs) is video-assisted thoracic surgery (VATS) for limited resection (wedge or segmental). VATS for limited resection can also be employed as a treatment strategy for PNs in minimally invasive tumor stages of cancer. To ensure its success, preoperative computed tomography (CT)-guided localization is performed.

METHODS

Search strategy (((hook wire) AND (((localization needle) OR (soft hook wire)) OR (anchored needle))) AND ((lung) OR (pulmonary))) AND (nodule).

Participant or population Patients with pulmonary nodules.

Intervention Anchored needle localization.

Comparator Hook-wire localization.

Study designs to be included Comparative studies.

Eligibility criteria (a) Types of study: comparative, (b) Languages: not limited, (c) Diseases: high-risk PNs, (d) Types of intervention: CT-guided anchored needle vs. hook-wire localization before VATS.

Information sources Pubmed, Wanfang, Cochrane Library.

Main outcome(s) Successful localization rate.

Quality assessment / Risk of bias analysis Newcastle-Ottawa scale.

Strategy of data synthesis All statistical assessments were carried out using Stata v12.0 (StataCorp, College Station, Texas, USA) and RevMan v5.3 (Cochrane, London, UK). Dichotomous and continuous variables were pooled. The heterogeneity was assessed via I2 statistic and Q test, and an I2 > 50% was deemed significant. Random- or fixed-effect models were employed, depending on whether the heterogeneity was significant. Furthermore, a "leave one out" approach was employed for sensitivity analyses to assess the sources of heterogeneity. Moreover, initially, the publication bias was analyzed by funnel plot, whereby if all studies are located within the funnel plot, the publication bias is considered negative; otherwise, Egger's test was performed. The publication bias was still considered negative if the p-value was ≥ 0.05.

Subgroup analysis None.

Sensitivity analysis Yes.

Language restriction None.

Country(ies) involved China.

Keywords CT, hook-wire, anchored needle, pulmonary nodule.

Contributions of each author
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Author 3 - Huamei Miao.