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INPLASY

Catheter ablation combined with left atrial appendage closure in atrial fibrillation: A meta-analysis of randomized controlled trials

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Cheng, YL; Tang, J; Shen, C; Jia, Y; Yang, R; Zou, C; Cheng, Y; He, TY; Li, DZ; Liao, XY.

Corresponding author:
Yonggang Cheng

chengyonglang666@163.com

Author Affiliation:
West China Hospital, Sichuan University.

ADMINISTRATIVE INFORMATION

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Review stage at the time of initial registration - Data analysis.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2026110028

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 8 November 2026 and was last updated on 8 November 2026.

INTRODUCTION

Review question / Objective To systematically evaluate the safety of catheter ablation combined with left atrial appendage closure/obliteration in the treatment of atrial fibrillation.

Condition being studied Catheter ablation combined with left atrial appendage closure in atrial fibrillation.

METHODS

Search strategy pubmed: ("Atrial Fibrillation"[Mesh] OR "atrial fibrillation"[tiab] OR "auricular fibrillation"[tiab]) AND ("Catheter Ablation"[Mesh] OR "catheter ablation"[tiab] OR "radiofrequency catheter ablation"[tiab] OR "percutaneous catheter ablation"[tiab] OR "transvenous catheter ablation"[tiab] OR "electrical catheter ablation"[tiab] OR ablat*[tiab] OR "pulmonary vein isolation"[tiab]) AND ("Left Atrial Appendage Closure"[Mesh] OR "Atrial Appendage/surgery"[Mesh] OR "left atrial appendage closure"[tiab] OR "left atrial appendage occlusion"[tiab] OR "left atrial appendage occlusion intervention"[tiab] OR "LAA closure"[tiab] OR "LAA closures"[tiab] OR "left atrial appendage"[tiab] OR "left auricular appendage"[tiab] OR LAAO[tiab] OR LAAC[tiab] OR Watchman[tiab]) AND ("Randomized Controlled Trial"[pt] OR "Controlled Clinical Trial"[pt] OR randomized[tiab] OR randomised[tiab] OR randomly[tiab] OR trial[tiab])

web of science: "atrial fibrillation" OR "auricular fibrillation" (Topic) AND ablat* OR "pulmonary vein isolation" OR "one-stop" OR "one stop" OR hybrid (Topic) AND "left atrial appendage" OR "left auricular appendage" OR LAAO OR LAAC OR

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Watchman OR Amplatzer OR Lariat (Topic) AND randomized OR randomised OR randomly OR randomization OR randomisation OR trial OR "controlled clinical trial" (All Fields)

Cochrane library :#1 Atrial Fibrillation 19335
#2 ("atrial fibrillation" OR "auricular fibrillation"):ti,ab,kw 18910
#3 #1 OR #2 19340
#4 Catheter Ablation 5184
#5 ("catheter ablation" OR "radiofrequency catheter ablation" OR "percutaneous catheter ablation" OR "transvenous catheter ablation" OR "electrical catheter ablation" OR ablat* OR "pulmonary vein isolation" OR "one-stop" OR "one stop" OR hybrid):ti,ab,kw 23099
#6 #4 OR #5 23157
#7 Left Atrial Appendage Closure 356
#8 ("left atrial appendage closure" OR "left atrial appendage occlusion" OR "left atrial appendage occlusion intervention" OR "left atrial appendage exclusion" OR "LAA closure" OR "left atrial appendage" OR "left auricular appendage" OR LAAO OR LAAC OR Watchman OR Amplatzer OR Lariat):ti,ab,kw 832
#9 #7 OR #8 836
#10 #3 AND #6 AND #9 198

万方：
主题:(
"心房颤动"
or "心房纤颤"
or "心房纤维性颤动"
or "房颤"
)
and
主题:(
"消融"
or "肺静脉隔离"
or "肺静脉电隔离"
or "一站式"
)
and
主题:(
"左心耳"
or "Watchman"
or "LAAO"
or "LAAC"
)
and
主题:(
"随机"
or "随机化"
or "随机对照"
or "随机对照试验"
or "随机对照研究"
or "随机分组"
or "随机分配"
)

知网：(
SU%='心房颤动'
OR SU%='心房纤颤'
OR SU%='心房纤维性颤动'
OR SU%='房颤'
)
AND
(
SU%='消融'
OR SU%='肺静脉隔离'
OR SU%='肺静脉电隔离'
OR SU%='一站式'
)
AND
(
SU%='左心耳'
OR SU%='Watchman'
OR SU%='LAAO'
OR SU%='LAAC'
)

Participant or population Adult patients with atrial fibrillation diagnosed by electrocardiogram.

Intervention Treatment of atrial fibrillation using catheter ablation combined with left atrial appendage closure.

Comparator Catheter ablation alone or combined with conventional treatment, routine management, etc.

Study designs to be included Randomized controlled trial.

Eligibility criteria The study was included based on the PICOS framework:
Population (P): Adult patients with atrial fibrillation diagnosed by electrocardiogram;
Intervention (I): Treatment of atrial fibrillation using catheter ablation combined with left atrial appendage closure;
Control (C): Catheter ablation alone or combined with conventional treatment, routine management, etc.;
Outcome (O): Reporting at least one safety outcome indicator;
Study Design (S): Published randomized controlled trials (RCTs).
Exclusion criteria:
The outcome report has no safety indicators;

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Non-randomized studies, reviews, case reports, animal studies, conference abstracts or dissertations;
The outcome data is incomplete or unavailable.

Information sources The study was included based on the PICOS framework:
Population (P): Adult patients with atrial fibrillation diagnosed by electrocardiogram;
Intervention (I): Treatment of atrial fibrillation using catheter ablation combined with left atrial appendage closure;
Control (C): Catheter ablation alone or combined with conventional treatment, routine management, etc.;
Outcome (O): Reporting at least one safety outcome indicator;
Study Design (S): Published randomized controlled trials (RCTs).
Exclusion criteria:
The outcome report has no safety indicators;
Non-randomized studies, reviews, case reports, animal studies, conference abstracts or dissertations;
The outcome data is incomplete or unavailable.

Main outcome(s) Embolic and bleeding events.

Additional outcomes Perioperative complications, Stroke

Data management Save the data using Excel, and continue with data analysis in Stata 15.0.

Quality assessment / Risk of bias analysis Two researchers independently used the Cochrane Risk of Bias 2 tool (RoB 2) to assess the risk of bias for each primary outcome in each included RCT. RoB 2 covers five areas: (1) bias arising from the randomization process; (2) bias resulting from deviations from the intended intervention; (3) bias due to missing outcome data; (4) bias in outcome measurement; (5) bias due to selective reporting of results. For each outcome, each area and the overall risk of bias were classified as "low risk", "unknown risk", or "high risk". Cross-validation was conducted, and differences were resolved through discussion or consultation with senior researchers.

Strategy of data synthesis A descriptive summary of individual research outcomes is provided. When the outcomes use the same definition and measurement units, they are considered comparable; for continuous biomarkers, when deciding whether to use the mean difference (MD) or the standardized mean difference (SMD), additional consideration is given to the detection method. Using Stata 15.0, a random effects model is employed for Meta-analysis of comparable outcomes. For continuous outcomes, MD or SMD analysis is used, while for binary outcomes, risk ratio (RR) analysis is adopted. All report 95% confidence intervals (CI). The I^2 statistic is used to assess heterogeneity. When significant heterogeneity is detected ($I^2 \geq 50\%$), a sensitivity analysis is planned by sequentially excluding individual studies to explore potential sources. Subgroup analysis is conducted when the number of studies allows; otherwise, a narrative description of heterogeneity is provided. Publication bias is evaluated using funnel plots, Egger's test, and Begg's test.

Subgroup analysis Not applicable.

Sensitivity analysis Not applicable.

Language restriction No language restrictions.

Country(ies) involved China.

Keywords Atrial fibrillation; Catheter ablation; Left atrial appendage closure; Randomized controlled trial; Safety.

Dissemination plans Publicly published achievements

Contributions of each author
Author 1 - Yonggang Cheng - Data extraction and analysis.
Email: chengyonglang666@163.com
Author 2 - Shen C.
Author 3 - Jia Y.
Author 4 - Yang R.
Author 5 - Zou C.
Author 6 - Cheng Y.
Author 7 - He TY.
Author 8 - Li DZ.
Author 9 - Liao Xiaoyang.

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