

INPLASY

Hysteroscopic removal versus curettage for retained products of conception following delivery or pregnancy loss: a systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

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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 11 October 2026 and was last updated on 11 October 2026.

INTRODUCTION

Review question / Objective To determine, in women with retained products of conception (RPOC) following delivery or pregnancy loss, whether hysteroscopic removal, compared with curettage-based evacuation, reduces intrauterine adhesion and incomplete evacuation or re-intervention, and improves subsequent conception and live birth.

P (Population): women with RPOC after delivery, miscarriage or termination of pregnancy requiring surgical evacuation.

I (Intervention): hysteroscopic removal (resection or morcellation).

C (Comparator): curettage-based evacuation (blind dilatation and curettage, or vacuum/electric aspiration).

O (Outcomes): primary — intrauterine adhesion, ascertained at second-look hysteroscopy; secondary — incomplete evacuation or re-intervention, subsequent conception and live birth;

certainty of evidence (GRADE); and study trustworthiness.

Rationale RPOC complicates approximately 1–6% of deliveries and is a leading cause of persistent bleeding, infection and intrauterine adhesions (IUA). Blind curettage risks injury to the endometrial basalis; IUA has been reported in 15–40% of women undergoing repeat curettage. Hysteroscopic removal allows direct visualisation and selective tissue removal and may better preserve the endometrium, but high-quality comparative evidence is scarce and previous reviews have largely pooled single-arm series. An up-to-date synthesis of comparative studies is therefore needed to quantify the comparative effects on adhesion and reproductive outcomes, and to appraise the trustworthiness of the available evidence.

Condition being studied Retained products of conception (RPOC) — incomplete expulsion of placental or fetal tissue following delivery,

miscarriage or termination of pregnancy, including incomplete abortion and missed miscarriage in which the retained tissue is the operative target.

METHODS

Search strategy PubMed (MEDLINE) was searched from inception to 9 October 2026, supplemented by Europe PMC, reference lists of included studies and relevant reviews, and the ClinicalTrials.gov and WHO ICTRP registries. A two-block strategy (population AND intervention) was used; no comparator block was imposed. The search was limited to English[Language] and deliberately did not apply the Humans[MeSH] filter, which excludes records not yet assigned MeSH terms.

Population block (core): "retained products of conception", "retained product of conception", "retained placenta", "retained placental tissue(s)", "residual trophoblast", "residual trophoblastic tissue", "placental remnant(s)", "retained tissue(s)", RPOC, "retained fetal tissue(s)", "intrauterine retention", "incomplete abortion", "incomplete miscarriage(s)", "incomplete spontaneous abortion". Broadened terms: "early pregnancy loss(es)", "first-trimester pregnancy loss", "missed abortion", "missed miscarriage(s)", "failed miscarriage", "anembryonic pregnancy".

Participant or population Women with retained products of conception (RPOC) following delivery, miscarriage or termination of pregnancy (including incomplete abortion and missed miscarriage), in whom the retained tissue is the operative target and who undergo surgical evacuation. Studies of mixed intrauterine pathology in which RPOC is not the operative target were excluded.

Intervention Hysteroscopic removal of RPOC — hysteroscopic resection (electroresection) or hysteroscopic morcellation — compared with curettage-based evacuation (blind dilatation and curettage, or vacuum/electric aspiration). Hysteroscopic removal is the intervention of interest; curettage-based evacuation is the comparator.

Comparator Curettage-based evacuation of RPOC: blind dilatation and curettage (D&C), or vacuum/electric aspiration (manual or electric vacuum aspiration).

Study designs to be included Randomised controlled trials; prospective and retrospective comparative cohorts (hysteroscopic removal vs curettage-based evacuation). For the descriptive

component, a purposive, illustrative set of single-arm hysteroscopic series. Case reports, reviews, diagnostic-accuracy studies and non-clinical reports were excluded.

Eligibility criteria Inclusion: (1) randomised controlled trials, prospective or retrospective comparative cohorts, and — for the descriptive component — single-arm hysteroscopic series; (2) women with RPOC following delivery, miscarriage or termination of pregnancy, including incomplete abortion or missed miscarriage, in which retained tissue is the operative target; (3) hysteroscopic removal as the intervention; (4) reporting at least one outcome of interest (intrauterine adhesion, incomplete evacuation or re-intervention, subsequent conception, live birth).

Exclusion: comparator not curettage-based evacuation; population in which RPOC is not the operative target; no extractable outcome data; overlapping data with an included study; non-English records.

Information sources PubMed (MEDLINE), searched from inception to 9 October 2026; Europe PMC; the reference lists of all included studies and of relevant reviews identified during screening; and the ClinicalTrials.gov and WHO ICTRP trial registries, for ongoing and unpublished trials. Forward and backward citation tracking of the principal randomised trials was also performed. The authors had no institutional access to Embase, Web of Science or the Cochrane Library; this is acknowledged as a limitation.

Main outcome(s) Intrauterine adhesion (IUA), ascertained at second-look hysteroscopy as reported by each study. Dichotomous outcome, pooled as an odds ratio (OR) with 95% confidence interval (CI) using a DerSimonian–Laird random-effects model with Hartung–Knapp adjustment, together with 95% prediction intervals. Timing: at the study-reported follow-up, predominantly 1–6 months after the procedure.

Additional outcome(s) (1) Incomplete evacuation or re-intervention requiring repeat surgery; (2) subsequent conception; (3) live birth. Each was a dichotomous outcome pooled as an OR (95% CI) using the same random-effects model. Certainty of evidence was rated with GRADE, and the trustworthiness of each study was appraised against the OBGYN Editors' Integrity Group criteria.

Data management A standardised data-extraction form captured study design, setting, population,

intervention and comparator characteristics, baseline data and dichotomous outcome events (with 2×2 counts where available). Two reviewers extracted data independently, resolving discrepancies by discussion with a third reviewer; primary-study authors were contacted where necessary. Data were entered into a dedicated spreadsheet and cross-checked against source reports.

Quality assessment / Risk of bias analysis The Cochrane Risk of Bias tool (RoB 2) was applied to randomised trials and the Newcastle–Ottawa Scale (NOS) to cohort studies; single-arm and descriptive studies were appraised narratively. Each study's trustworthiness was additionally appraised against the consensus criteria of the OBGYN Editors' Integrity Group: for randomised trials, the five 'absolute' criteria (no retraction; prospective registration before randomisation; ethics approval; CONSORT adherence; consistency of the primary outcome with registration) together with the 'other quality' criteria, adapted similarly for observational studies. Two reviewers assessed risk of bias independently, with disagreements resolved by a third reviewer. Certainty of evidence was rated with GRADE.

Strategy of data synthesis Dichotomous outcomes were pooled as odds ratios (OR) with 95% confidence intervals (CI) using a DerSimonian–Laird random-effects model, applying a 0.5 continuity correction where any cell was zero; the OR was chosen a priori because baseline risks varied across populations. Heterogeneity was quantified with I^2 and τ^2 . Given the small number of studies per outcome, Hartung–Knapp variance correction and 95% prediction intervals were also reported. Pre-specified sensitivity analyses removed each study in turn and included/excluded the companion non-randomised cohort of the principal trial and a study of adjunctive hysteroscopy; a risk-ratio sensitivity analysis was also performed. Certainty of evidence was rated with GRADE.

Subgroup analysis Formal subgroup analyses were not pre-specified, because only four to six studies contributed to each outcome. Exploratory comparisons examined the influence of population (postpartum vs post-abortion/mixed), study design (randomised vs observational) and risk of bias, alongside inspection of heterogeneity (I^2 and τ^2) across studies.

Sensitivity analysis Pre-specified sensitivity analyses: (1) leave-one-out removal of each study in turn, for each outcome; (2) inclusion versus

exclusion of the companion non-randomised cohort of the principal trial (NTR4923; Wagenaar 2023b); (3) inclusion versus exclusion of a study of adjunctive hysteroscopy (Hu 2024; live birth); (4) a risk-ratio (RR) sensitivity analysis in place of the odds ratio; and (5) Hartung–Knapp variance correction with 95% prediction intervals, to account for the small number of studies. No participant was counted twice within any single analysis: the multiple reports of the NTR4923 trial were handled by using the randomised component in the primary analysis and the companion cohort in sensitivity analyses.

Language restriction English only (English[Language]); non-English records were excluded.

Country(ies) involved China.

Other relevant information This review was registered retrospectively; the data had already been extracted and analysed at the time of registration. The review was conducted and reported according to PRISMA 2020. No external funding was received. The authors had no access to Embase, Web of Science or the Cochrane Library.

Keywords retained products of conception; hysteroscopy; curettage; intrauterine adhesion; re-intervention; conception; live birth; meta-analysis.

Dissemination plans Publication as a systematic review in a peer-reviewed journal; the findings will also be presented at relevant obstetrics and gynaecology conferences.

Contributions of each author

Author 1 - Ji Lin - JL conceived the study, performed the search and analysis, and drafted the manuscript. PC and QH screened records and extracted data independently. SH resolved disagreements and appraised risk of bias.

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