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Endovascular versus Open Surgical Revascularisation for Acute Mesenteric Ischaemia: Protocol for a Systematic Review and Meta-analysis

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ADMINISTRATIVE INFORMATION

Support - No external funding; study performed with institutional resources.

Review Stage at time of this submission - Risk of bias assessment.

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 22 April 2025 and was last updated on 22 April 2025.

INTRODUCTION

Review question / Objective Does endovascular revascularisation reduce short-term mortality and morbidity compared with open surgical revascularisation in adults with acute arterial mesenteric ischaemia?

Rationale Despite wider adoption of catheter-based thrombectomy, thrombolysis and stenting, comparative outcome data versus open embolectomy/bypass remain fragmented. A consolidated evidence synthesis is needed to inform guideline recommendations and operative decision-making in this high-mortality emergency.

Condition being studied Acute arterial mesenteric ischaemia (AMI): sudden interruption of blood flow to the small bowel causing transmural necrosis, sepsis and multi-organ failure.

METHODS

Search strategy MEDLINE (Ovid), Embase, CENTRAL, Scopus, Web of Science searched from 1990-Aug 2024 using terms: ("mesenteric isch*" OR "superior mesenteric artery" OR "intestinal isch*") AND ("endovascular" OR "thrombectomy" OR "angioplasty" OR "stent*" OR "catheter thrombolysis") AND ("open surgery" OR "embolectomy" OR "bypass"). Backward citation screening, forward citation tracking in Scopus, ClinicalTrials.gov, WHO ICTRP and grey literature via ProQuest Dissertations.

Participant or population Adults ≥18 y with angiographically or operatively confirmed acute arterial AMI (embolic or thrombotic).

Intervention Endovascular revascularisation (catheter-directed thrombolysis ± mechanical thrombectomy, angioplasty or stenting).

Comparator Open surgical revascularisation (open embolectomy, thrombectomy, patch angioplasty or bypass graft).

Study designs to be included Prospective or retrospective comparative cohort studies.

Eligibility criteria Exclude randomised trials, non-comparative series/reports, chronic or venous AMI, paediatric cohorts, abstracts without full data, studies lacking mortality or bowel-viability outcomes.

Information sources Electronic databases; trial registries; conference proceedings; reference lists; direct author contact for missing data.

Main outcome(s) Primary: all-cause mortality (in-hospital or ≤30 days), risk ratio with 95 % CI.

Additional outcome(s) Bowel-resection rate, second-look laparotomy, any re-intervention, length of hospital stay, Clavien-Dindo ≥III complications, direct hospital costs.

Data management Search results managed in Rayyan; duplicate removal via EndNote. Extraction in duplicate to a piloted Excel sheet; data dictionary stored on OSF.

Quality assessment / Risk of bias analysis Two reviewers apply ROBINS-I for all comparative cohorts; discrepancies resolved by consensus or third reviewer.

Strategy of data synthesis Random-effects DerSimonian–Laird meta-analysis; heterogeneity by I^2; Hartung-Knapp adjustment if <10 studies; narrative SWiM where pooling infeasible; GRADE for certainty.

Subgroup analysis By aetiology (embolic vs thrombotic).

Sensitivity analysis Remove high ROBINS-I risk, leave-one-out influence, fixed-effect model, exclusion of studies with imputed data.

Language restriction None.

Country(ies) involved Brazil.

Other relevant information Registered in PROSPERO CRD42023454389; full protocol PDF and materials available on Zenodo (10.5281/zenodo.15264126).

Keywords acute mesenteric ischaemia; endovascular; open surgery; systematic review; meta-analysis.

Dissemination plans Results to be submitted to a peer-review vascular-surgery journal and presented at the 2025 SVS Vascular Annual Meeting; preprint will be posted on medRxiv.

Contributions of each author

Author 1 - Nailton Oliveira - conceived the review, designed methodology, supervised the project, drafted the protocol.conceived the study, drafted the protocol, searching, select and writing.
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Author 2 - Marcio Amaral - developed search strategy, piloted selection/extraction forms, co-wrote the first manuscript draft.conceived the study, drafted the protocol, searching, select and writing.
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