

# INPLASY PROTOCOL

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We declare no conflicts of  
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## Locoregional Anesthesia Versus General Anesthesia in Endovascular Repair of Ruptured Abdominal Aortic Aneurysm: A Meta-Analysis

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### ABSTRACT

**Review question:** Which type of anesthesia for endovascular repair of ruptured abdominal aortic aneurysm is better: local/regional anesthesia or general anesthesia?

**Rationale:** Endovascular repair of ruptured abdominal aortic aneurysms (rAAAs) is mainly performed under general anesthesia (GA), which may exacerbate the hemodynamic instability and even cause hemodynamic collapse. Locoregional anesthesia (LA) was reported to provide more stable hemodynamics in that procedure. Therefore, we combine and analyze the current evidence to reveal the impact of the anesthesia modality on perioperative mortality in endovascular repair of rAAAs (REVAR).

**Methods:** We will be thoroughly searched the databases with following combinations of these terms (either as key words or MeSH terms): "Ruptured Abdominal Aortic Aneurysm", "rAAAs", "Aortic Aneurysm, Abdominal" and "Aortic Rupture", "stenting", "Blood Vessel Prosthesis Implantation", "endovascular repair", "local anaesthesia", "regional anaesthesia", "general anaesthesia", "spinal", "epidural", "MAC", "Monitored anesthesia care".

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 29 March 2020 and was last updated on 29 March 2020 (registration number INPLASY202030010).

### INTRODUCTION

**Objectives / Review question:** Which type of anesthesia for endovascular repair of ruptured abdominal aortic aneurysm is

better: local/regional anesthesia or general anesthesia?

**Rationale:** Endovascular repair of ruptured abdominal aortic aneurysms (rAAAs) is mainly performed under general anesthesia

(GA), which may exacerbate the hemodynamic instability and even cause hemodynamic collapse. Locoregional anesthesia (LA) was reported to provide more stable hemodynamics in that procedure. Therefore, we combine and analyze the current evidence to reveal the impact of the anesthesia modality on perioperative mortality in endovascular repair of rAAAs(REVAR).

**Condition being studied:** Abdominal aortic aneurysm is a potentially lethal condition that results in an estimated 150,000–200,000 deaths per year worldwide. In the treatment of ruptured abdominal aortic aneurysms (rAAAs), traditional open repair by replacement of the aneurysm with straight or bifurcated grafts carries a higher incidence of perioperative mortality than endovascular repair. Thus, endovascular repair of rAAAs (REVAR) has become the preferred approach for treating patients diagnosed with rAAAs with suitable anatomy. However, a recent systematic review reported that the perioperative mortality of REVAR is still as high as 24.5%. Therefore, there is still an urgent need to enhance the perioperative management and develop sound operative strategies for rAAA. REVAR is mainly performed under general anesthesia (GA), which may exacerbate the hemodynamic instability and even cause hemodynamic collapse. However, a study published in 2002 reported that more stable hemodynamics were achieved by performing REVAR under locoregional anesthesia (LA) rather than GA. Since then, several studies have explored the impact of the anesthesia modality on the perioperative outcomes of REVAR. Therefore, the present meta-analysis combine and analyze the current evidence to reveal the impact of the anesthesia modality on perioperative mortality in REVAR.

## METHODS

**Participant or population:** Patients with Ruptured Abdominal Aortic Aneurysm who underwent emergency endovascular repair

with stent grafts under local/regional Anesthesia or General Anesthesia.

**Intervention:** LA includes local anesthesia and regional anesthesia. Local anesthesia refers to skin infiltration with a local anesthetic agent such as lidocaine or levobupivacaine with or without sedation with propofol or midazolam. Regional anesthesia was defined as spinal or epidural anesthesia or a combination of both, or paravertebral blockade with sedation using propofol or midazolam.

**Comparator:** GA refers to intravenous anesthetic induction and maintenance with volatile agents or total intravenous anesthesia with propofol.<sup>7</sup> If a REVAR procedure was started under LA but later converted to GA, this was classified as REVAR under GA.

**Study designs to be included:** Prospective or retrospective cohort studies and randomized controlled trials (RCTs) will be included.

**Eligibility criteria:** Studies that reported the 30-day/in-hospital mortality rate or the multivariate adjusted odds ratio (OR) or hazard ratio (HR) for patients undergoing REVAR with stent grafts under LA versus GA.

**Information sources:** The following databases will be searched from database inception to January 2020: Embase, PubMed, Science Citation Index, The Cochrane Library, and Wanfang Data. Potentially relevant studies will be also identified through a manual search of the references of initially identified articles and all systematic reviews comparing endovascular versus open repair for rAAAs.

**Main outcome(s):** 30-day/in-hospital mortality

**Additional outcome(s):** None.

**Data management:** Two investigators (Rong D and Ge YY) independently extract all data from each article, including: first author's name, publication year, study

duration, country, number of patients, age, sex (male), and 30-day/in-hospital mortality. The adjusted OR or HR with the corresponding 95% confidence interval (CI) was directly extracted (if available). Any disagreements on data collection will be resolved via discussion with the senior investigator (Guo W).

**Quality assessment / Risk of bias analysis:** The Cochrane Collaboration risk assessment tool will be used to assess the quality or bias of RCTs. The quality of cohort studies will be assessed using the Newcastle Ottawa Quality Assessment Scale (NOS) that includes the following items: selection of the involved groups, comparability between two groups, and assessment of follow-up and outcomes. The NOS adopts a point system, with a maximum of 9 points; the risk of bias is considered to be low in studies with a score of 9 points, moderate in studies with a score of 7 or 8 points, and high in studies with a score of 6 or points less. Each study will be initially assessed separately by two independent reviewers (Deng JQ and Liu J), followed by a joint discussion to obtain the final quality assessment score for each individual study.

**Strategy of data synthesis:** Overall incidence rates(OR) with 95% confidence intervals (CI) will be calculated employing random-effects models regardless of the heterogeneity to get a relatively conservative results.

**Subgroup analysis:** Subgroup analysis will be conducted to explore the origin of substantial heterogeneity according to the publication year, Country, Sample size,etc.

**Sensibility analysis:** Sensitivity analysis will be performed using the leave-one-out approach.

**Language:** English and Chinese.

**Countries involved:** China.

**Other relevant information:** None.

**Keywords:** Abdominal aortic aneurysm; aortic rupture; anesthesia; endovascular aneurysm repair; meta-analysis.

**Contributions of each author:**

Author 1 - Conception and design the meta-analysis, Analysis and interpretation, Writing the article.

Author 2 - Analysis and interpretation,quality assessment, critical revision of the article.

Author 3 - Database Searching and data collection, critical revision of the article.

Author 4 - Database Searching and data collection, critical revision of the article.

Author 5 - Conception and design the meta-analysis, critical revision of the article.

Author 6 - Analysis and interpretation, critical revision of the article.

Author 7 - Conception and design the meta-analysis, data extraction, writing the article.