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Protocol

Systematic Review and Meta-Analysis Assessing Perioperative and Oncologic Outcomes in Patients Undergoing Urologic Procedures with a History of Prior Abdominal/Pelvic Surgery: Study Protocol

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Abstract: Prior abdominal/pelvic surgery (PAS) has the potential to impact perioperative and oncologic outcomes in patients undergoing urologic surgery. There is a need to study outcomes in this population to determine if reoperation is safe and feasible. This review will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and has been registered with PROSPERO (ID: CRD42022361935). The search for articles will be conducted in PubMed, Scopus, and Web of Science, and additional articles may be identified by reviewing the manuscripts of the included literature. Outcomes of interest will be used to determine if reoperation is safe and feasible in this population.

Keywords: cystectomy; prostatectomy; nephrectomy; prior abdominal surgery; outcomes; systematic review; meta-analysis

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1. Introduction

An aging population is more likely to carry comorbidities with the potential to complicate surgical interventions [1–3]. Furthermore, a history of prior insults, such as previous abdominal or pelvic surgical interventions, has the potential to complicate any subsequent surgery [4–7]. In 2014, Goldfarb et al. published a grading system based on previous abdominal insults to stratify the risk of patients undergoing surgery [8,9]. It highlights the importance of considering prior abdominal/pelvic surgeries (PAS) when performing subsequent interventions.

Previous studies have assessed the impact of prior abdominal intervention on subsequent urologic surgeries [10–12]. For example, one study assessing outcomes following partial nephrectomy showed that PAS was associated with higher estimated blood loss [4]. Patients undergoing robot-assisted radical cystectomy with a history of PAS had more postoperative complications and a lower lymph node yield [10]. Other surgical specialties have conducted systematic reviews assessing the impact of PAS on future general surgery procedures [13]. To our knowledge, there is no systematic review with meta-analysis assessing the impact of PAS on perioperative and oncologic outcomes of a subsequent urologic–oncologic surgery.

This systematic review with meta-analysis will be accomplished with the scope of assessing if a history of PAS does or does not have an impact on perioperative outcomes and/or oncological adequacy in patients undergoing the most common major urologic–oncologic surgeries: simple/radical cystectomy, simple/radical prostatectomy, and partial/radical nephrectomy.

2. Methods

This systematic review will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [14]. The review was previously registered on PROSPERO (ID: CRD42022361935). This protocol was developed considering the PRISMA-protocol extension [15].

3. Eligibility Criteria

Table 1 summarizes the participants, interventions, comparators, outcomes, time, and settings considered, according to the PICOTS strategy.

Table 1. PICOTS Description for Systematic Review.

Population	Diagnoses: bladder, kidney, prostate disease
Interventions	Urologic surgery (simple/radical cystectomy, simple/radical prostatectomy, partial/radical nephrectomy)
Comparators	Comparison between patients with no-PAS and PAS
Outcomes	Perioperative outcomes: • Operative time (minutes) • Estimated blood loss (ccs) • Transfusion rate (*n*, %) • Intraoperative Complication rate (*n*, %) • Postoperative Complication rate (*n*, %) ○ Overall ○ Minor (CD I, II) ○ Major (CD ≥III) ○ 30-day, 90-day • Readmission rate (*n*, %) • Conversion rate (*n*, %) • Hospital length of stay (days) • Warm ischemia time (minutes)
	Oncologic/survival outcomes: • Positive surgical margins (*n*, %) • Lymphadenectomy rate (*n*, %) • Lymph node count (number of nodes) • Recurrence rate (*n*, %) • Overall survival (*n*, %) • Cancer specific survival (*n*, %)
Type of Studies	All available comparative studies, comparing outcome of interest: retrospective studies, prospective nonrandomized and prospective randomized controlled trials
Timing and setting	Studies published in the period 1 January 2000–15 September 2022, any setting

PICOTS: population, intervention, comparators, outcomes, time, setting; PAS: prior abdominal/pelvic surgery; CD: Clavien–Dindo.

3.1. Types of Participants/Population

We will include adult participants with an age $\geq$ 18 years old, with any bladder, prostate, or kidney disease requiring a major abdominal or pelvic surgery.

3.2. Type of Interventions and Comparators

We will assess the comparator intervention (no-PAS) versus the experimental intervention (PAS), creating a subgroup analysis for each surgical procedure: simple/radical cystectomy, simple/radical prostatectomy, partial/radical nephrectomy.

3.3. Type of Outcomes Measured

We will compare the following perioperative, oncological, and survival outcomes between no-PAS and PAS groups:

Perioperative outcomes of interest will include operative time (minutes), estimated blood loss (ccs), transfusion rate (*n*, %), overall complication rate (*n*, %), minor (Clavien–Dindo I–II), major (Clavien–Dindo $\geq$ III), early ($\leq$30-day), late ($\leq$90-day), readmission rate (*n*, %), hospital length of stay (days), warm ischemia time (minutes), and conversion rate (*n*, %).

Oncologic outcomes of interest will include positive surgical margins (*n*, %), lymphadenectomy rate (*n*, %), and lymph node count (number of nodes).

Survival outcomes will include recurrence-free survival (*n*, %), overall survival (*n*, %), and cancer specific survival (*n*, %).

4. Search Strategy

A systematic review will be performed according to the Preferred Reporting Items for Systematic Reviews in Meta-Analysis (PRISMA) [14] and Cochrane guidelines [16]. The search will be performed in PubMed, Scopus, and Web of Science. Additional articles may be identified by reviewing the manuscripts of the included articles.

The same search strategy will be used in all three queried databases. The PRISMA-S extension for search strategies in systematic reviews was considered [17], detailed in Supplementary Materials Table S1.

For the meta-analysis, only comparative studies, including retrospective and prospective randomized and nonrandomized studies, will be included. Noncomparative studies reporting outcomes of interest will be included and reported in a cumulative fashion.

Articles will be included if they were published after 1 January 2000, included $\geq$10 participants, studied patients who underwent PAS with subsequent urologic intervention as described in the PICOTS, and are in the English language. Systematic reviews, case reports, replies, editorials, cohort studies, and articles not conforming to the previously described PICOTS will be excluded.

5. Data Records and Management

Articles identified from the search of the three databases will be uploaded into the Covidence citation manager. Duplicated citations will be automatically removed. Then, two reviewers will independently screen the titles and abstracts based on the inclusion and exclusion criteria. Disagreements will be resolved by a third senior reviewer. Then, two independent reviewers will screen the full texts of the included articles; again, disagreements will be resolved by a third reviewer. Finally, two reviewers will extract relevant data and disagreements will be resolved by a third reviewer.

The following information will be collected: type of previous abdominal/pelvic intervention, the current urological intervention, article title, article journal, the number of patients, article level of evidence, type of study, period of surgeries, number of surgeons, and study design. Baseline characteristics of the patient populations will be collected. The outcomes of interest were discussed previously.

6. Risk of Bias

Two independent reviewers will utilize the Robins I and Robins II system for assessing the quality of nonrandomized and randomized studies, respectively [18,19].

7. Data Synthesis

Initially, we will group the studies based on urologic surgery as follows: simple/radical cystectomy, simple/radical prostatectomy, and partial/radical nephrectomy. Depending on the number of studies, we will consider other analysis groupings. In this study, we will compare the outcomes of no-PAS versus PAS.

For the intervention meta-analysis comparing no-PAS versus PAS, weighted mean difference (WMD) will be used to compare continuous variables (operative time, estimated blood loss, warm ischemia time, length of stay, lymph node count). Risk ratio (RR) and hazard ratio (HR) will be used in the comparison of categorical variables when appropriate (transfusion rate, complicate rate, readmission rate, positive surgical margins, lymphadenectomy rate, recurrence rate, overall survival). We will perform a cumulative intervention meta-analysis as well as subgroup analysis based on the type of intervention. The cumulative meta-analysis will be conducted using Review Manager V 5.4 (Cochrane Collaboration, Oxford, UK).

Depending on the articles we identify, we may also perform an inverse variance meta-analysis to examine the cumulative effect of PAS as a predictor for the outcomes of interest. This analysis will involve using Cox proportional hazards regression or logistic regression to analyze risk ratios and their 95% confidence intervals.

We will use the X^2 test to determine whether there is statistical heterogeneity for each comparison between studies. If the *p*-value is less than 0.10, we will conclude that there is heterogeneity and use a random effects model for our pooled analysis. If the *p*-value is greater than 0.10, we will use a fixed-effects model.

We will assess the publication bias using the inspection of the funnel plots.

In addition to the meta-analysis, we will describe the included articles in text form and consider presenting relevant outcomes of interest in data tables.

8. Ethics and Dissemination

We aim to publish the results of this study in peer-reviewed academic journals. We plan to use our social media to share the article once published in accordance with any copyright and embargo regulations. No ethical approval is required for this study as it does not involve original data. We aim to publish the most informative systematic review to date on this topic. It will conform to standardized PRISMA methodology and use the well-established Robins I and II tools for risk of bias assessment.

9. Patient and Public Involvement

Patients and the public will not be involved in the development or completion of this project.

10. Presentation of Results and Reporting

PRISMA guidelines [14] and their extension will be followed for the proper reporting of the outcomes of the present systematic review, and the PRISMA checklist will be presented.

11. Implication of the Review

While a history of previous abdominal surgery may complicate subsequent abdominal procedures, there is no systematic review with meta-analysis assessing the impact of PAS on subsequent urologic operations. This publication will aim to inform the urologic and greater surgical community on whether surgery is safe and feasible in this population.

The strengths of this study will include a comprehensive review of the literature assessing the impact of PAS on subsequent urologic surgery. Its potential limitations include heterogeneity in study designs, as well as mostly retrospective study designs.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/complications1010002/s1. Table S1: PRISMA-S Extension Checklist.

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