

# INPLASY PROTOCOL

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## Application of robotic surgery and traditional laparoscopic surgery in lymph node dissection for gynecological cancer: a meta-analysis

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**Review question / Objective:** Robotic surgery; laparoscopic surgery; lymph node dissection; gynecological cancer.

**Condition being studied:** It's unclear how many lymph nodes are removed during laparoscopic and robotic surgery, thus in order to help with clinical management, this meta-analysis looks at how many lymph nodes are removed throughout each procedure to see whether there are any differences.

**Information sources:** PubMed, Cochrane Library, Web of science, Embase, China National Knowledge Infrastructure (CNKI) and Wanfang Data Knowledge Service Platform (WANFANG Data).

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 December 2022 and was last updated on 11 December 2022 (registration number INPLASY2022120046).

### INTRODUCTION

**Review question / Objective:** Robotic surgery; laparoscopic surgery; lymph node dissection; gynecological cancer.

**Condition being studied:** It's unclear how many lymph nodes are removed during laparoscopic and robotic surgery, thus in order to help with clinical management, this meta-analysis looks at how many lymph nodes are removed throughout each

procedure to see whether there are any differences.

## METHODS

**Participant or population:** It took two researchers to do a literature search, screening, and extraction of relevant material. When there were questions or conflicts, a third person was consulted before making a decision. Basic features (author, year, research kind, field of research on gynecological cancers, number of patients, age, and place of diagnosis) and outcome indicators are included in this data (number of retrieved pelvic lymph node and para-aortic lymph node, operative time, estimated blood loss, recurrence rate and mortality rate).

**Intervention:** The study type is cohort study and randomized controlled trial (RCT) study; the language is limited to English; the observation group was treated by robotic surgery for gynecological cancer, while the control group was treated by laparoscopic surgery for gynecological cancer, including cervical cancer, ovarian cancer and endometrial cancer.

**Comparator:** Not applicable.

**Study designs to be included:** The study type is cohort study and randomized controlled trial (RCT) study.

**Eligibility criteria:** The language is limited to English; the observation group was treated by robotic surgery for gynecological cancer, while the control group was treated by laparoscopic surgery for gynecological cancer, including cervical cancer, ovarian cancer and endometrial cancer. **Exclusion criteria:** repeated publication; research without full text, incomplete information or inability to conduct data extraction; animal experiments; reviews and systematic reviews.

**Information sources:** PubMed, Cochrane Library, Web of science, Embase, China National Knowledge Infrastructure (CNKI) and Wanfang Data Knowledge Service Platform (WANFANG Data).

**Main outcome(s):** Researchers found that robotic surgery was able to retrieve more pelvic and para-aortic lymph nodes than traditional laparoscopic surgery, which is consistent with earlier investigations. When it comes to blood loss, robotic surgery is far less risky than traditional laparoscopic surgery despite the fact that the operating duration is not significantly different. As a result, there was no statistically significant difference in the recurrence rates of the two surgical modalities, and the mortality rate associated with robotic surgery was lower than that of laparoscopic surgery.

**Quality assessment / Risk of bias analysis:** The Newcastle-Ottawa Scale (NOS) for evaluating the quality of published literature is carried out separately by two academics [14], and it was used to evaluate the quality of 16 cohort studies, NOS includes 4 items (4 points) for "Research Subject Selection", 1 item (2 points) for "Comparability between Groups" and 3 items (3 points) for "Result Measurement", with a full score of 9 points and  $\geq 7$  is regarded as High-quality literature,  $< 7$  is divided into lower-quality literature. The quality of the remaining two RCT studies was assessed against the Cochrane Risk Assessment Scale using the Review manager 5.3 software risk assessment tool. Meta-analysis was performed using Stata 15.0. Using OS and PFS as the main evaluation indicators, subgroup analysis was performed based on the source of ctDNA specimens, ctDNA detection methods, and FIGO staging. I<sup>2</sup> test were used to assess the heterogeneity between studies. If the studies were homogenous ( $P \geq 0.1$  and  $I^2 \leq 50\%$ ), the fixed effect model would be used for combined analysis; If the studies were heterogeneous ( $P < 0.1$  and  $I^2 > 50\%$ ), sensitivity analysis or subgroup analysis would be used to find the source of heterogeneity. When the heterogeneity is still large, we used the random effect model or gave up the results and used descriptive analysis. When the number of individual outcome indicators included in the literature was more than 10, the publication bias of each indicator was analyzed using a funnel chart and Egger's bias test.

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**Strategy of data synthesis:** The data was analyzed with the help of the STATA (version 15.1) program. This study used the combined effect size of SMD (with a 95 percent confidence interval) as a continuous variable to measure the number of retrieved pelvic lymph nodes and para-aortic lymph nodes, as well as the amount of time spent operating and estimated blood loss, and the odds ratio (with a 95 percent confidence interval) as a binary variable to measure the rates of recurrence and mortality, respectively. The I<sup>2</sup> statistic is used to determine the degree of heterogeneity. If the results of the test for heterogeneity were  $P \geq 0.1$  and  $I^2 \leq 50$  percent, this showed that the studies were homogeneous, and a fixed effects model was used for the combined analysis; if the results were  $P > 50\%$ , this indicated that the studies were heterogeneous. Because of this, sensitivity analysis or subgroup analysis was required to identify the source of heterogeneity. It is recommended that the random effects model be employed or that the merging of results be abandoned and replaced with descriptive analysis. Egger's bias test was used to analyze the publication prejudice.

**Subgroup analysis:** subgroup analysis of comparison in the number of pelvic and para-aortic lymph nodes retrieved and by robotic surgery and laparoscopic surgery; the comparison of operation time and estimated blood loss between robotic surgery and laparoscopic surgery.

**Sensitivity analysis:** The remaining investigations were subjected to a summative analysis to see whether any of the included studies had a disproportionate influence on the meta-overall analysis's results, which was accomplished using sensitivity analyses that eliminated each included research one at a time. According to the meta-analysis, no research had a substantial influence on its results, suggesting that the findings were steady and credible.

**Country(ies) involved:** Department of Gynecology, Guigang People's Hospital,

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**Keywords:** robotic surgery; laparoscopic surgery; lymph node dissection; gynecological cancer.

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