



Review

Superiority of robotic surgery for cervical cancer in comparison with traditional approaches: A systematic review and meta-analysis



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HIGHLIGHTS

- To review the safety and effectiveness of da Vinci robotic surgery for cervical cancer in comparison with the traditional surgery.
- Compared to open surgery, robotic surgery have advantageous in length of hospital stay, incidence of complications, volume of blood loss and blood transfusion.
- In comparison with laparoscopic surgery, robotic surgery could offer benefits in terms of the length of hospital stay.

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ABSTRACT

Objectives: To review the safety and effectiveness of da Vinci robotic surgery for cervical cancer in comparison with the traditional open surgery and conventional laparoscopic operation.

Methods: Based on Medline, the Cochrane library, Embase, and the Journal of Robotic Surgery prior to December 30st, 2015, we searched for controlled trials and observational studies. A systematic review with meta-analyses was conducted to compare the clinical efficacy between the da Vinci robotic surgery, open surgery, and laparoscopic surgery for cervical cancer. Data were pooled using the random effects meta-analysis.

Results: Compared with the open surgery, the robotic surgery for cervical cancer would be advantageous in terms of the length of hospital stay, incidence of complications, volume of blood loss and blood transfusion. The operative time of robotic surgery was longer than that of the open surgery, but the prediction intervals indicated that they could be shorter in future studies. Meanwhile, compared with conventional laparoscopic surgery, the robotic surgery could offer more benefits in terms of the length of hospital stay, while no difference was found in terms of the incidence of complications and the volume of blood loss.

Conclusions: Compared to open surgery, the robotic surgery would be advantageous for cervical cancer patients in terms of the length of hospital stay, the incidence of complications, blood loss and blood transfusion. Compared with conventional laparoscopic surgery, the robotic surgery would result in longer OT, more BL and shorter LOS. The study quality was poor.

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1. Introduction

For the surgical treatment of cervical cancer, open radical hysterectomy with pelvic lymph node dissection has been considered

as the gold standard in the past century since it was first described by Wertheim [1]. The laparoscopic surgery is known to be advantages over the laparotomy, with reduced pain, improved aesthetics, shorter length of hospital stay, and faster recovery to normal

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activities [2,3]. On the other hand, the laparoscopic surgery also has some requirements, such as the of higher levels operating skill for the surgeons [4], and the longer learning curve than the open operation [5].

In 2005, the Food and Drug Administration approved for the utilization of the da Vinci Surgical System (Intuitive Surgical Inc., Sunnyvale, CA, USA) in the gynecologic procedures. Henceforward, many studies have demonstrated the advantages of robotic assistance in overcoming some of the limitations of minimally invasive laparoscopic surgery by enabling surgeons to perform more complex procedures through improved visualization, more accurate control of instruments and the increased ease-of-use [6–8]. At present, da Vinci robot surgery for cervical cancer has been universally used. It have been verified that the robot-assisted surgery was associated with fewer conversions and reduced estimated blood loss (BL) than the conventional laparoscopic surgery, [9,10]. Although several studies analyzed the differences between the robotic gynecological surgery and the traditional operation method in terms of the clinical results, there was no large sample, randomized, and controlled trial concentrated on this aspect. Therefore, the present study sought to carry out a systematic review and meta-analysis to explore the safety and effectiveness of robotic surgery for cervical cancer patients. The clinical outcomes of robotic surgery were systemically compared with the traditional

open surgery and conventional laparoscopic operation.

2. Methods

2.1. Literature searches

A computerized literature search was conducted from the inception to December 30th 2015 including the Medline, Embase, and the Cochrane library. The search terms comprised the followings: (robot-assisted* or robot* or Davinci or da Vinci) AND (open or laparotom* or traditional or laparoscop*) AND (radical hysterectomy, hysterectomy). We limited the search to English-language studies and in the patients with cervical cancer. In addition, the reference lists of the selected articles were hand-searched to identify additional relevant reports. Google and other Internet search engines were also used to search for additional information.

2.2. Selection and exclusion criteria

The study inclusion criteria were listed as followings: ①Original papers contained independent data. The study was designed as the randomized controlled trials (RCTs) and, when unavailable, observational studies (prospective, retrospective, and controlled clinical trials); ②Subjects should be cervical cancer patients who were

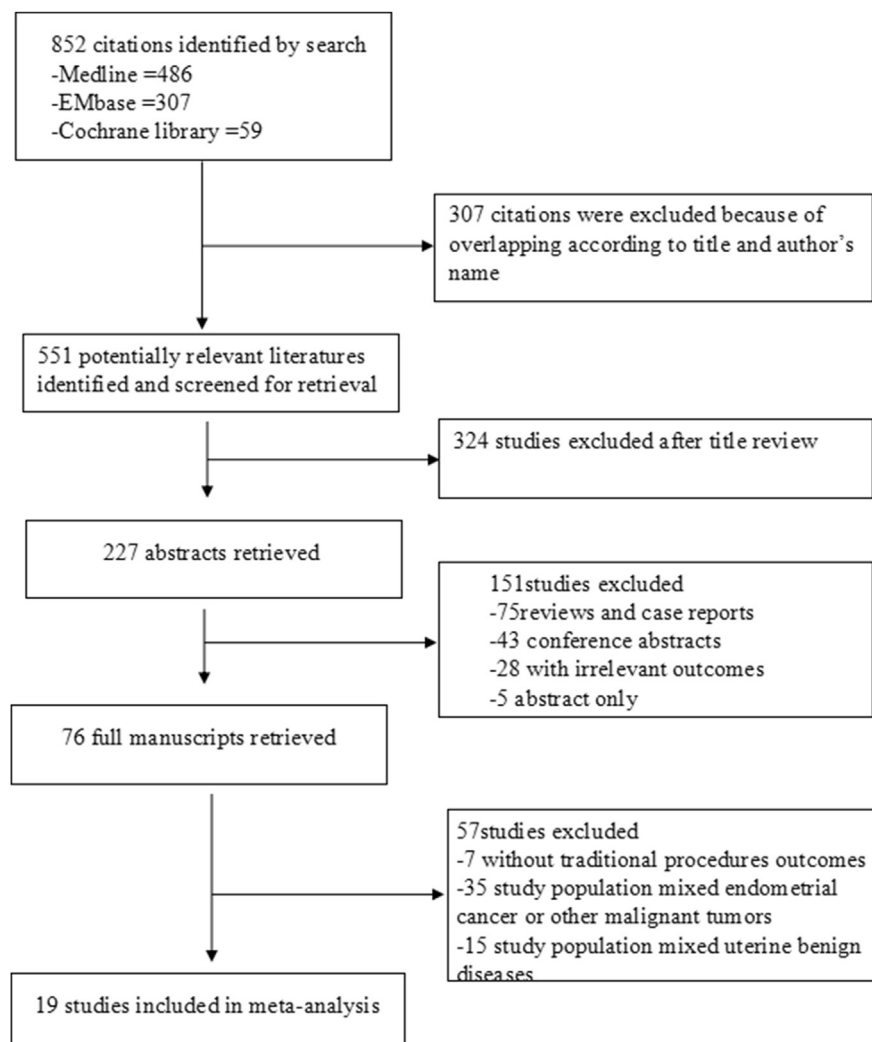


Fig. 1. The search strategy and number of studies identified for inclusion in this meta-analysis.

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