



Review article

Robotic radical hysterectomy in early stage cervical cancer: A systematic review and meta-analysis



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HIGHLIGHTS

- Meta-analysis of 26 non-randomized studies comparing robotic, laparoscopic, and abdominal radical hysterectomy for women with stage IA1–IIA cervical cancer.
- Robotic radical hysterectomy was associated with less estimated blood loss, febrile morbidity, and shorter hospital stay compared to abdominal approach.
- Robotic radical hysterectomy and laparoscopic radical hysterectomy appear equivalent in intraoperative and short-term postoperative outcomes.

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ABSTRACT

Objective. To compare intraoperative and short-term postoperative outcomes of robotic radical hysterectomy (RRH) to laparoscopic and open approaches in the treatment of early stage cervical cancer.

Methods. A search of MEDLINE, EMBASE (using Ovid interface) and SCOPUS databases was conducted from database inception through February 15, 2014. We included studies comparing surgical approaches to radical hysterectomy (robotic vs. laparoscopic or abdominal, or both) in women with stages IA1–IIA cervical cancer. Intraoperative outcomes included estimated blood loss (EBL), operative time, number of pelvic lymph nodes harvested and intraoperative complications. Postoperative outcomes were hospital stay and surgical morbidity. The random effects model was used to pool weighted mean differences (WMDs) and odds ratios (OR).

Results. Twenty six nonrandomized studies were included (10 RRH vs abdominal radical hysterectomy [ARH], 9 RRH vs laparoscopic radical hysterectomy [LRH] and 7 compared all 3 approaches) enrolling 4013 women (1013 RRH, 710 LRH and 2290 ARH). RRH was associated with less EBL (WMD = 384.3, 95% CI = 233.7, 534.8) and shorter hospital stay (WMD = 3.55, 95% CI = 2.10, 5.00) than ARH. RRH was also associated with lower odds of febrile morbidity (OR = 0.43, 95% CI = 0.20–0.89), blood transfusion (OR = 0.12, 95% CI 0.06, 0.25) and wound-related complications (OR = 0.31, 95% CI = 0.13, 0.73) vs. ARH. RRH was comparable to LRH in all intra- and postoperative outcomes.

Conclusion. Current evidence suggests that RRH may be superior to ARH with lower EBL, shorter hospital stay, less febrile morbidity and wound-related complications. RRH and LRH appear equivalent in intraoperative and short-term postoperative outcomes and thus the choice of approach can be tailored to the choice of patient and surgeon.

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1. Introduction

In spite of universally adopted screening programs, cervical cancer remains the third most common malignancy among women worldwide [1]. Early stage cervical cancer is defined as International Federation of Gynaecology and Obstetrics (FIGO) stages IA1–IIA, and represents the majority of patients at the time of presentation. Fortunately, the probability of survival at these stages is generally high provided the disease is appropriately evaluated and managed [2]. Radical hysterectomy is the standard surgical procedure for the treatment of early stage cervical cancer. Although effective, radical hysterectomy is associated with serious complications, of which urinary tract-related morbidities predominate [3].

Traditionally, laparotomy had been the only available approach for radical hysterectomy. The promising outcomes and evolving experience in minimally invasive surgery in the late 80's allowed surgeons to evaluate its validity in complex oncologic surgeries [3]. Initially, the laparoscopic approach was restricted to pelvic lymph node dissection as an adjuvant step to vaginal radical hysterectomy [4]. Subsequently, the effectiveness, safety, and benefits of short hospital stay associated with laparoscopic oncologic procedures were reported [5]. With further development of instruments and skill, laparoscopic surgery has proved to be at least as effective as traditional hysterectomy in managing

benign gynecologic conditions [6]. For endometrial cancer treatment, the laparoscopic approach yielded comparable outcomes to laparotomy without adversely impacting survival [3,7]. In spite of these benefits, the adoption of a laparoscopic approach for gynecological malignancies was tempered by the longer operative time compared to laparotomy [7].

In 2008, the first case series of robotic radical hysterectomy was published, demonstrating potential advantages of the new technique over traditional laparoscopy, including improved visualization, enhanced articulation and ease of dissection, and lower rates of complications [8]. Since then, robotic surgery has been widely disseminated in gynecologic oncology and many studies were conducted to test and validate this approach for indications including cervical cancer [9–37].

Currently, four available approaches of radical hysterectomy (open or abdominal, vaginal, laparoscopic, robotic) are variably implemented with conflicting evidence. Evidence to support the use of robotic surgery over other approaches in early cervical cancer is still lacking. The aim of this systematic review and meta-analysis is to compare intraoperative and postoperative complications between robotic radical hysterectomy and other surgical methods in the treatment of early stage cervical cancer. Radical vaginal hysterectomy has been adopted only in certain specialized centers, and this was not evaluated in this meta-analysis.

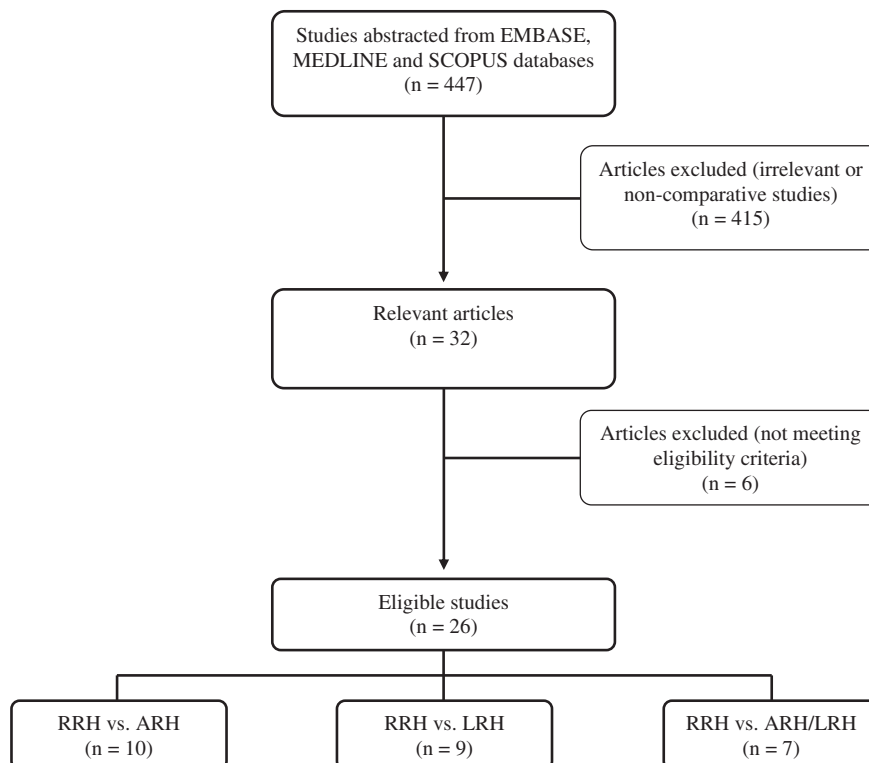


Fig. 1. Flow chart of study selection.

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