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Review article

# Patient positioning for robot-assisted laparoscopic benign gynecologic surgery: A review

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ABSTRACT

Robotic surgical platforms are now in widespread use in the practice of gynecology all over the world. The introduction of robotic surgery has required some modifications of patient positioning when compared to standard laparoscopic surgery. Optimal patient positioning is likely to be the most essential step of robotic surgery as it provides the technical feasibility to have adequate access to the pelvic structures for performing the surgery. It is prudent to pay attention to preventing patient shifting in Trendelenburg position because of tendency of sliding down toward the direction of the head. Inappropriate patient positioning is associated with inadequate exposure of the operative field as well as detrimental complications that may lead to long-term side effects. These issues can be reduced with use of proper or strategic positioning technique. The purpose of this review is to highlight important points to properly position patient for robot-assisted laparoscopic benign gynecologic surgery and protect patient from position-related injuries.



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## Introduction

Hysterectomy is one of the most common surgical procedures performed for benign reasons in the practice of gynecology. Minimally invasive surgeries (MIS) should be the preferred approach when performing a hysterectomy according to the American Congress of Obstetricians and Gynecologists (ACOG) [1]. There has been a considerable increase in utilizing a robotic

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platform for hysterectomy since 2005, when the Food and Drug Administration (FDA) approved it for use in gynecologic surgeries. The adoption of robotic platforms in gynecology has facilitated its applicability for hysterectomies because of its short learning curve, improved ergonomics, three-dimensional visualization and increased articulation of endowrist instruments.

To perform successful robot-assisted surgery, an experienced team properly executes essential steps in preparing a patient for surgery; these are patient positioning, robotic port placement, and docking [2]. Optimal positioning enables the surgeon to properly perform the surgery by permitting access to the pelvic structures, decreasing compression injury rate, and maximizing movements of the robotic arms. After the robotic arms are attached to the ports, the surgeon should refrain from changing the patient's position as this may be associated with intraoperative complications [3–10].

This review aims to provide information regarding patient positioning for robot-assisted laparoscopic benign gynecologic surgery, particularly robot-assisted hysterectomy (RAH), and to highlight important points to protect patient from position-related injuries.

*Preoperative consideration*

Since the length of robotic surgery may take hours for a significant proportion of patients, RAH may possibly increase the risk of deep vein thrombosis (DVT). According to ACOG, individual and procedure-dependent risk factors should be taken into consideration for thromboprophylaxis [11]. A recent review by Ramirez et al. recommended that pneumatic compression devices should be used for all patients who undergo MIS [12]. We recommend use of compression stockings together with sequential compression devices, regardless of a patient's risk factor for DVT. Also, low–molecular weight heparin for a total of 28 days is postoperatively administered in the presence of risk factors for VTE, as suggested by Ramirez et al.

Studies have shown visualization of the operative field to remain unchanged with the use of nasogastric tube or preoperative

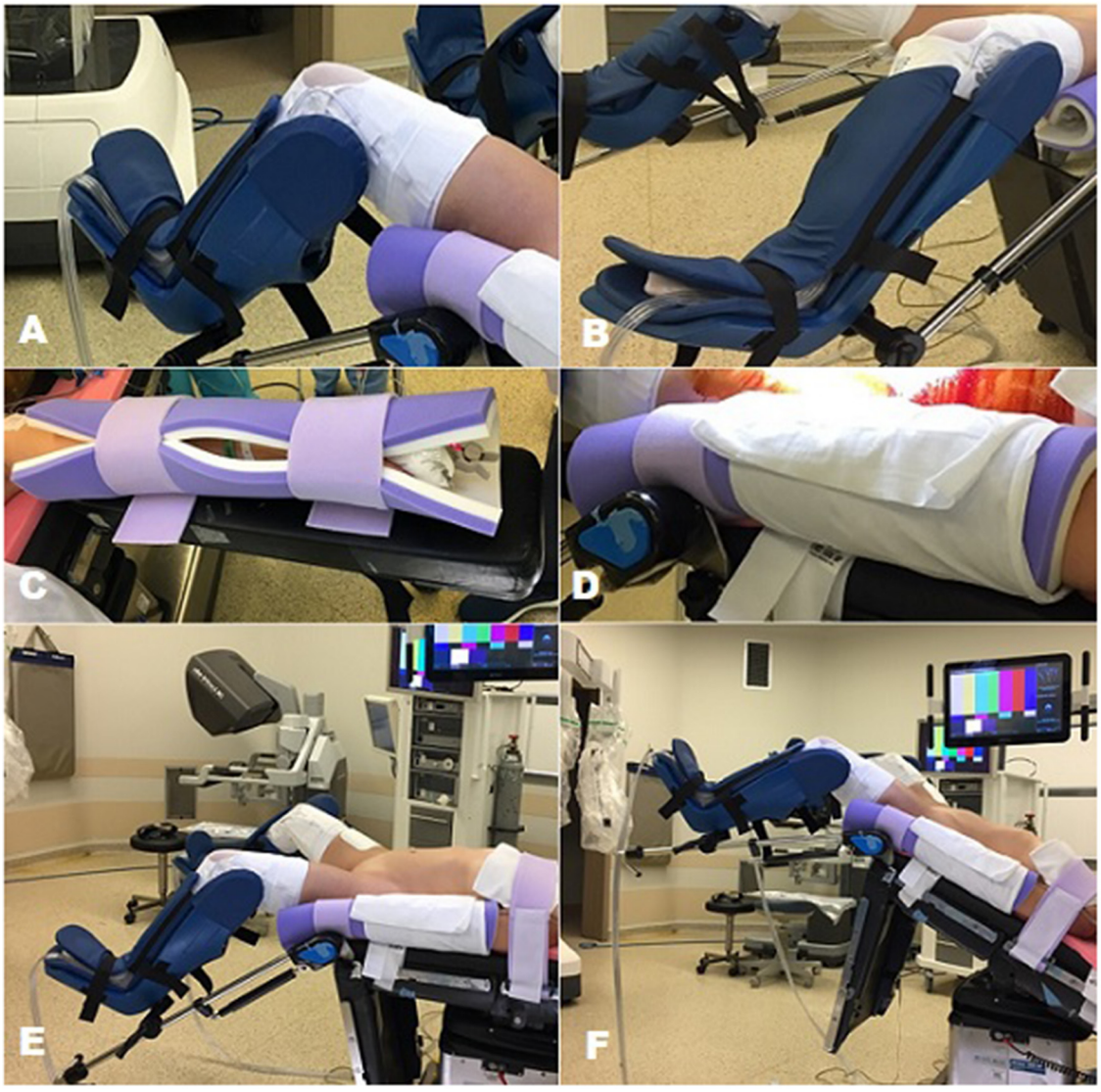


**Fig. 1.** Demonstration of patient positioning for robot-assisted laparoscopic benign gynecologic surgery. A and B- Allen stirrups are used to position patient's legs; the thigh-trunk angle is approximately 170 ° and the knees flexion is less than 90°. C and D- Patient's arms are covered with foam eggcrate; the hands are kept in loose position and protected putting small piece of pad into their palms. E and F- Patient lies in the modified lithotomy position before and after Trendelenburg position (Picture F aims to demonstrate steeper Trendelenburg position, but in general patient is brought to this position following the placement of trocars and the docking). (Pictures were taken in the operating room of Acibadem Mehmet Ali Aydinlar University).