Patient Preparation and Positioning on Robot-Assisted and Robotic Surgeries

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ABSTRACT

The field of robotic surgery is being developed and is increasingly being applied to many and different surgical procedures. This results in the need of looking for different patient placements, which will give the surgeon the best view of the area of clinical interest. The purpose of this paper is to study and investigate the various ways of patient preparation and positioning in the field of robotic surgery. Also, this paper proposes a classification and comparing between these different positions, depending on the procedure.

KEYWORDS

Patient Positioning, Patient Preparation, Review, Robot-Assisted Surgery, Robotic Surgery, Trendelenburg
INTRODUCTION

The introduction of robotic surgical systems and their integration into challenging and complicated surgeries have dramatically changed the concept of laparoscopic surgery since its limitations are abolished. The laparoscopic surgery with the help of the robotic systems provides three-dimensional high-resolution image, precision, versatility and superior articulation of the robotic arm in relation to the human wrist, maximizing ergonomics. With robotic surgery, the idea of minimal invasive surgery has been achieved, resulting in a faster recovery of the patient, thus reducing the length of hospitalization accordingly. Furthermore, the likelihood of infection is minimized, and blood loss is reduced to almost zero compared to a conventional surgery for the same operation. Robotic surgery also causes smaller incisions that have a better aesthetic effect and less post-operative pain. The main goal of patient positioning is to keep patient safe during the procedure, avoid compression injuries, maximize the mobility of robotic arms, and facilitate smooth and effective surgery. Proper patient preparation and positioning is important to prevent robotic system errors, that may occur if the patient is displaced after the attachment of the device. Moreover, safe placement of the patient has the best surgical effect. There are many dangers in robotic surgery, however, the correct positioning of the patient on the operating table, the pre-operative procedures and the patient’s position during surgery, significantly reduce the relative risks. The patient’s risk of sliding off the operating table or the risk of injury of the patient or staff member from a robotic arm of the device or any other component, or explosions of medical gases due to valve leakage, is small but not zero. Frequent inspections and maintenance of the equipment limit and even eliminate these risks. Also, re-positioning drastically reduces the time of the operation and the risk of nerve damage or other injury. Finally, with the correct placement, the patient is not injured, which in turn decreases the length of time he stays in the hospital postoperatively.

PATIENT POSITIONING IN GYNECOLOGICAL SURGERIES

The treatment of gynecological diseases with robotic surgery is not widely known. This has the effect that the surgeon is often responsible for the position of the patient during the surgery since there is no universal pattern or method. The most commonly position used, regardless of the surgery, is the following one (Figure 1).

Initially, the patient is placed in a supine position and then he is pulled down on the bed until the sacrum is in the middle of the operating table and the lower part of the buttocks in alignment with the lower break of the bed. The head, trunk and perineum are on the same axis of the surgery table, and then the person is placed in a lithotomy position with his feet attached on special Yellofin stirrups. Emphasis is also given on the upper limbs in order to minimize the pressure caused by an incautious placement. Finally, the patient’s position is re-examined and the operation begins.
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