Patient Positioning for Robotic Urologic Procedures

Robert I. Carey and Raymond J. Leveillee

Advances in robotic-assisted laparoscopic surgery have exponentially increased since the introduction of the da Vinci® Surgical System (Intuitive Surgical Inc., Sunnyvale, CA). “Robotic” surgery has become more prevalent in many centers of surgical excellence around the world. The radical retropubic prostatectomy for treatment of prostate cancer has become a focal point of experience for robotic-assisted operations in the pelvis. The most common robotic-assisted renal operation has been the dismembered pyeloplasty. Although necessary long-term follow-up of these procedures has not yet been achieved, it is becoming increasingly apparent that robotic technology is changing the standard of care for complex urologic procedures. In this chapter, we describe logistical issues pertaining to patient positioning for these two most commonly performed urologic operations. Emphasis will be placed on patient and staff safety issues, ergonomics, and optimizing surgical exposure.

Proper positioning of the patient is a necessary first step for robotic-assisted laparoscopic procedures. Without proper patient positioning and port placement, robotic-assisted procedures are tedious to perform and patient outcomes are compromised. Obtaining the proper patient position is a dynamic process that requires the supervision of the surgeon. Not only should the patient be protected from injuries, but the optimal position must allow safe docking of the robot, as well as access for the bedside surgeon to the surgical assistant ports. This chapter will focus on the major points for positioning and port placement for the most common robotic-assisted urologic procedures. We will describe the positioning related to robotic-assisted laparoscopic renal procedures (pyeloplasty) as well as procedures in the pelvis (radical prostatectomy, pelvic lymph node dissection, ureterovesical re-implants).

10.1. Robotic-Assisted Laparoscopic Prostatectomy

For a robotic-assisted laparoscopic prostatectomy (RALP), patients are ultimately positioned in the supine position in a steep Trendelenburg incline, as shown in Figure 10.1. Initially, a compression hose and sequential compression devices are placed prior to the induction of general anesthesia for venous thromboembolism prophylaxis. Positioning starts with the table horizontal to the floor (neutral position) and the patient flat/supine with the buttocks at the end of the table break. The caudal end of the table is then lowered until it is perpendicular to the plane of the table. The legs are placed in Allen stirrups (Allen Medical Systems, Acton, MA) with the knees flexed and lowered so as not to interfere with the docking of the robot. Individual gel pads are placed bilaterally from the shoulders to the hips to minimize trauma at pressure points. The patient is held into position with a desufflated “bean bag” (Olympic Vac Pac, Olympic Medical, Seattle, WA). The elbows and wrists are positioned in such a way as to allow slight flexion, with the fingertips ideally situated on the anterolateral thigh. The arms are tucked at the side of the patient. One
should avoid placing the arms perpendicular to the chest (like a crucifix) in order to avoid injury to the brachial plexus. The elbows and wrists are protected with foam padding with slight bend at the elbow and wrist. The arms should be kept low at the side of the patient in order to avoid contact with the lateral working arms of the robot. This is especially important when using a four-arm robotic system. Although the lateral most trocars will be placed medial to the anterior superior iliac spine (ASIS), the patient’s arms should be placed in a position that allows the prepped field to be lateral to the ASIS. Three-inch cloth tape is used to further secure the bean bag to the cranial and caudal ends of the table. The chest is secured with the placement of a horizontal three-inch tape, as well as Velcro straps. The legs should be placed into their low lithotomy position prior to draping to ensure that the knees are flexed and properly angulated. At this point the stability of the patient in steep Trendelenburg should be tested, as seen in Figure 10.1. This allows a thorough inspection of all pressure points and allows the anesthesia team to visualize the extent to which the patient will be positioned once the drapes are applied. Once the patient is draped, small movements of the patient may go unnoticed. The shoulders should be fixed and well padded. The head should be stable. A picture of a positioned patient ready to be prepped is shown in Figure 10.2.

The patient is prepped from the mid-epigastrium to the genitalia and mid-thigh, including the perineum. Leg drapes are placed followed by a 3M™ Steri-Drape™ Urological Drape 1071 (3M Company, St Paul, MN) with a rectal bougie that is held in place with towel hammock secured to each leg, as seen in Figure 10.3. A 16 Fr, 10-mL Foley catheter is inserted on the field. The field is established for the bedside assistant to have access to the perineum for intraoperative rectal and urethral manipulation. The abdominal drapes are placed and a Mayo stand can be used...