Robotic surgery has rapidly progressed into the mainstream of modern surgical practice. The da Vinci® Surgical System (Intuitive Surgical Inc., Sunnyvale, CA) has been particularly embraced by the urologic community. Some of the urologic applications include pyeloplasty, cystectomy with diversion, adrenalectomy, pelvic floor reconstruction, nephrectomy, and partial nephrectomy. However, the robotic system’s largest impact has been in its use for radical prostatectomy. It has been calculated that in 2005, 20% of all radical prostatectomies performed in the United States are performed using a robotic platform, and that number is projected to grow significantly. International usage is also gaining increased acceptance.

Complications are an inherent part of any surgery and the surgeon’s goal is to minimize the number of complications. Complication rates are reduced by selecting appropriate candidates for surgery, choosing the best operation for the specific indication, using meticulous technique, and recognizing and treating complications quickly and effectively when they do occur in order to minimize the impact of the problem. A robotic interface may reduce the rate of operative complications because it provides the surgeon with the following advantages: magnified, three-dimensional (3D) vision, digitized hand movements that can filter tremor, and superior maneuverability of robotic instruments. One of the potential disadvantages of the robotic system is that there is no tactile feedback, thus surgeons can not rely on the feel of the tissues to guide the dissection. This also removes the surgeon’s ability to manually gauge the appropriate tension required while suturing and knot tying. However, our opinion is that the superior visualization of the operative field allows the surgeon to adopt visual cues, thus replacing the need for tactile cues.

In this chapter, we will discuss complications that can occur during robotic surgery. We have identified specific points where complications can occur and make suggestions to limit them. Patient positioning, anesthetic considerations, robotic setup and port placement, and establishment of pneumoperitoneum will be addressed. Because radical prostatectomy and pyeloplasty are the most common procedures performed using the robotic platform, we will review the reported complications of each and describe techniques for avoiding them. The importance of an experienced operative team as well as the impact of surgeon experience, or the learning curve, are other noteworthy considerations.

22.1. Patient Positioning and Anesthetic Issues

Proper patient positioning on the operating table is essential to allow optimal exposure of the desired operative field, as well as to prevent neuromuscular injuries. This is even more critical if a da Vinci® robotic surgery platform is to be utilized. The patient’s position must provide access to the operative site while accommodating the robotic camera and working arms. Once the robot has been docked, there can be no...
adjustment of the patient’s position because the robotic surgical cart is locked in a fixed position adjacent to the patient. This requires that the patient be secured into position so there is no accidental movement during the procedure. This also is problematic for the anesthesiologist, who must carefully arrange intravenous (IV) access and arterial lines (if required) prior to positioning because access will be limited once the robotic portion of the procedure is initiated. For pelvic surgery, the patient is placed in a Trendelenburg position with the lower extremities in lithotomy stirrups. We place a gelfoam mat over the operating table, which provides padding to the pressure points as well as gently adheres to the patient’s skin. This assists in maintaining the desired position despite the angle of Trendelenburg. Other surgeons use straps placed over thoracic foam padding to secure the patient’s position. Bean bag devices are also used but risk the possibility of unnoticed leakage and deflation while covered by the drapes. The clavicle can be pushed into the brachial plexus if shoulder braces are used to prevent sliding in a steep Trendelenburg position. The elbows are wrapped in gel foam or other padding. The hands are flexed into a fist over a foam squeeze ball and the entire upper extremity is tucked at the patient’s side using the bed sheet (Figures 22.1–22.4). This helps prevent injury to the brachial plexus and ulnar nerve. For pelvic surgery, the robotic tower must be positioned between the patient’s legs, which are

**Figure 22.1.** Hand is flexed into a fist over a sponge ball.

**Figure 22.2.** Hand is wrapped with gauze to secure position.

**Figure 22.3.** Pressure points are adequately padded with gelfoam.

**Figure 22.4.** The bed sheet is used to secure the upper extremities at the patient’s side.