Robotic surgery is rapidly gaining popularity throughout the United States. Increasing numbers of hospitals are offering robotic procedures for a variety of indications. Surgical patients, especially those considered higher risk, benefit from the minimally invasive nature of robotic surgery.

Contraindications to robotic surgery are the same as those for laparoscopic procedures. The only absolute contraindication is increased intracranial pressure. Relative contraindications, because exaggerated Trendelenburg position is required, include severe cardiac disease, severe emphysema or other chronic respiratory disease, glaucoma, or history of stroke or cerebral aneurysm.  

8.1. Preoperative Period

All patients are evaluated within a month of surgery by the urology and anesthesia services, at which time a complete history and detailed physical examination is performed. Inguinal and umbilical hernias are sought because they can be repaired at the time of the robotic procedure. Surgical scars from previous abdominal operations or trauma may indicate significant intra-abdominal adhesions. Surgical technique and potential benefits and risks are reviewed. Complications unique to robotic and minimally invasive surgeries should be described, including air embolus and shoulder discomfort secondary to referred diaphragmatic irritation by residual intraabdominal carbon dioxide. Early ambulation and pulmonary exercise are emphasized to minimize the risk of anesthesia and exaggerated Trendelenburg.

Operative risk is estimated according to the preoperative American Society of Anesthesiology (ASA) classification. Patients with significant cardiac history or symptomatology are scheduled for preoperative cardiology clearance. Those with history of significant lung disease or respiratory symptoms are evaluated by a pulmonologist. For patients undergoing cystectomy with urinary diversion, enterostomal therapy consultation is obtained. Most patients are admitted to the ambulatory surgery unit on the day of surgery, where an intravenous (IV) line is placed, and fluids and antibiotics are started. A blood type and screen is drawn, when appropriate.

8.2. Intraoperative Considerations

Robotic radical prostatectomy, radical cystectomy, and distal ureterectomy are all performed with the patient in exaggerated Trendelenburg and the abdomen insufflated with carbon dioxide gas to 15 mm Hg. Some patients may become hypotensive from diminished venous return to the heart. The physician may lessen the angle of Trendelenburg and/or incrementally decrease the amount of insufflation in an attempt restore blood pressure and continue the operation. Of course, the presence of an acute process such as hemorrhage must be considered.

Pneumothorax must be suspected if oxygen saturation declines. Intraoperatively, breath sounds are evaluated and the diaphragm is
inspected. The presence of a bulging diaphragm suggests significant pneumothorax, which can be confirmed with chest X-ray. If diagnosis is made visually in a clinically stable patient, the pneumothorax can be managed expectantly because carbon dioxide pneumothorax will resolve over two hours. Otherwise, a small chest tube is inserted and the operation continues.

8.3. Robotic Radical Prostatectomy

Radical prostatectomy is recognized as the gold standard surgical treatment for localized prostate cancer. The invasive nature of radical surgery with its resultant side effects and impact on quality of life has influenced many patients to seek alternate forms of treatment. Guillonneau and Vallancien have shown that laparoscopic prostatectomy is possible. However, this minimally invasive alternative to open surgery is a technically demanding procedure with a learning curve that is unacceptable for most urologists. The da Vinci robot (Intuitive Surgical Inc., Sunnyvale, CA) has been shown to significantly shorten the laparoscopic learning curve. Several studies comparing open and robotic prostatectomy have reported advantages for the robotic method, including decreased operative blood loss, less postoperative pain, and shorter hospital stay, while maintaining similar oncologic outcomes and complication rates.

8.3.1. Patient Selection

The indications for robotic radical prostatectomy are identical to those for open or laparoscopic radical prostatectomy. However, there is a learning curve that should influence case selection for as few as 20 to 25 cases in some series to as many as 150 cases. Although there are no anatomic contraindications that apply solely to robotic radical prostatectomy, there are some cases that may prove more difficult. These cases include patients with previous androgen deprivation therapy, previous transurethral resection of the prostate (TURP) or open simple prostatectomy, history of prostatitis, morbid obesity, large prostates, median lobes, or previous abdominal or pelvic surgery. Surgeons may be more selective regarding which cases they perform robotically at the beginning of the learning curve. As experience is gained, these factors become less important considerations.

An excellent gauge of increasing operative skill is the ability to handle obesity. Obesity, defined as a body mass index (BMI = weight in kilograms/height in square meters) greater than 30 kg/m², is a major health issue in the United States with a rising trend documented over the past 30 years. Ahlering and colleagues reported that obese patients undergoing robotic prostatectomy had significantly worse baseline urinary and sexual function, greater risk of developing significant complications, and did not recover urinary function as quickly or as well as nonobese patients. Although robotic prostatectomy was limited to men less than 100 kg early in our experience, men up to 135 kg with BMI 37.4 have been treated robotically.

8.3.2. Preoperative Period

Patients undergoing robotic radical prostatectomy proceed along a common pathway with few exceptions (Roswell Park Cancer Institute Robotic Radical Prostatectomy Pathway). Patients eat a clear liquid diet the day prior to surgery and take nothing by mouth after midnight. On the morning of surgery, patients take an enema for bowel preparation.

8.3.3. Postoperative Period

Following surgery, standard preprinted order forms are used [see Day Of Surgery Postoperative and Day Of Discharge forms (Figures 8.1 and 8.2). Patient specific variations in postoperative care are identified by open checkboxes, which are filled in by the physician. Sequential compression devices are worn, except when the patient is ambulating. All patients receive IV fluids, ranitidine for ulcer prophylaxis, ketorolac for pain prophylaxis, oral analgesics as needed for pain, oxybutynin as needed for bladder spasms, promethazine as needed for nausea, and diphenhydramine as needed for sleep. Patients may have sips of liquids in the immediate postoperative period. They receive assistance getting out of bed into a chair and ambulating, and are encouraged