Application of emerging technologies to urologic oncology
Haber, G.P.

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CHAPTER 11

SUMMARY

In this chapter, I will outline the major conclusions and study limitations for each of the projects described in this book.

For kidney cancer application, laparoscopic partial nephrectomy has emerged as a viable alternative to open partial nephrectomy while minimizing patient morbidity. It is a technically challenging procedure because of its intraoperative complexity and potential complications. Adequate prior laparoscopic experience is necessary. Long-term functional and oncological outcomes are awaited.

Given the technical and oncological issues involved, progress in laparoscopic surgery for bladder cancer has been appropriately slow and measured. Laparoscopic radical cystectomy provides oncologic outcomes comparable to contemporary open radical cystectomy series. This study is limited by a relatively small number of patients who have completed 5 years follow-up.

However, the extirpative portion of LRC is efficiently performed by purely laparoscopic techniques, most of the morbidity appears to be associated with the urinary diversion. A substantial learning curve is observed, particularly for the pure laparoscopic approach wherein the entire procedure is being performed completely intracorporeally. Open-assisted technique of LRC, wherein the urinary diversion is constructed extracorporeally via a mini-laparotomy incision, appears to be technically more efficient, associated with a quicker recovery profile, and decreased complication rates when compared to pure laparoscopy.

The perioperative complication rate of laparoscopic surgery for urological malignancy is low. Intraoperative and postoperative hemorrhage appears to be the most frequent complication. Despite increasing challenging cases over time, the complication rate has tended to decrease. Laparoscopy belongs in the mainstream of urologic surgery. These data provide a basis for proper preoperative risk counseling and stratification of patients and modification of procedure-specific technique to minimize complications and improve patient care.

Laparoscopic partial nephrectomy was performed safely in obese patients, with a perioperative complication rate similar to that of non-obese patients. The retroperitoneal
approach was associated with a shorter operative time and hospital stay in the obese and non-obese patients.

Laparoscopic oncologic renal surgery is technically challenging but feasible in patients with major disease involving the aorta and/or vena cava. There was no difference as regards perioperative parameters between the aortic and vena cava groups. In addition, previous treatment of the great vessels did not preclude subsequent laparoscopic intervention.

Concerning prostate cancer, laparoscopic radical prostatectomy using TRUS monitored cold cutting release of the lateral pedicle and NVB during nerve-sparing LRP, and delicate hemostatic suturing eliminates the need for all thermal in the proximity of the NVB. Bulldog placement on the lateral prostatic pedicle does not interrupt blood loss flow within the NVB. Preliminary potency data remain to be confirmed in a large number of patients.

Laparoscopic surgery substantially reduces abdominal wall trauma compared with open surgery. This translates into less postoperative pain, a faster recovery, fewer wound complications, and improved cosmetic outcomes. Single-port surgery can be performed through one incision that can be hidden within the umbilicus, rendering select transperitoneal procedures scarless. In addition to the superior cosmetic result, there is a potential to reduce comorbidities. This evolution will require the demonstration of benefit over existing standard practice, which then must be embraced by urology in order to be implemented.

Natural orifice transluminal endoscopic surgery (NOTES) has been widely discussed with limited clinical application due to the limitation of instrumentation at the leak of triangulation. The da Vinci® system (Intuitive Surgical, Sunnyvale, CA) offers 6-degrees of freedom provided by the wrist motions; this addition becomes important in the leak of triangulation. Robotic NOTES pyeloplasty, partial nephrectomy and radical nephrectomy are feasible and safe in the porcine model. It has the potential of a less morbid approach with scarless surgery. Although the procedures were all successful in the porcine model, some modifications are required for clinical applications.