

## URINARY DIVERSION

Radical Cystectomy (RC) and subsequent Urinary Diversion (UD) have been assessed as the most difficult surgical procedure in urology<sup>1-3,5</sup>. Complications rates overall following RC and UD are significant, and when strict reporting criteria are incorporated, they are much higher than previously published<sup>6</sup>. Evidence suggests an association between surgical volume and outcome in RC; the challenge of optimum care for elderly patients with co-morbidities is best mastered at high-volume hospitals by high-volume surgeons<sup>7-9</sup>. Preoperative patient information, patient selection, surgical techniques, and careful postoperative follow-up are the cornerstones to achieve good long-term results. Nevertheless, excellent results are obtained in the hands of high-volume surgeons and with regular long-term follow-up<sup>10-12</sup>.

Complications following UD after pelvic irradiation have been attributed to radiation damage to the ureter and bowel, resulting in increased rates of anastomotic problems, upper urinary tract obstruction, and infection. Therefore, most centers use supra vesical urinary diversion with a transverse colonic segment or cutaneous ureterostomy[6]. In general, renal function after diversion into continent detubularized reservoirs compares favorably with ileal conduit diversion. However, the literature is insufficient to recommend one form of diversion over another<sup>13-19</sup>.

There remains a long-term risk of renal deterioration, which is often asymptomatic, and thus close follow-up is necessary for all patients who have undergone UD to identify correctable causes early. Those with renal pathology prior to surgery seem to be at greatest risk of postoperative renal deterioration. Serum creatinine is an imprecise measure of renal function. Isotopic GFR measurement detects renal function deterioration most accurately and at an early stage. Serum creatinine and ultrasound should be followed by diuresis renography if upper tract dilation is seen. Early intervention for physical obstruction often results in a sustained improvement in renal function<sup>20-24</sup>.

Patients who have undergone conduit diversion, continent cutaneous diversion, or Orthotopic bladder do

not seem to be at increased risk of secondary malignancy. By comparison, the risk is slightly higher after cystoplasty, albeit not increased enough to support endoscopic surveillance. However, the present knowledge regarding gastric cystoplasty is insufficient, and hence patients should be followed after such surgery. Yearly colonoscopy is recommended after uretersigmoidostomy, beginning 10 yr after the procedure<sup>25</sup>. At high-volume hospitals, orthotopic reconstruction has become the procedure of choice for UD in both men and women undergoing RC. In these patients, the construction of a neobladder allows the elimination of a stoma and preservation of body image without compromising cancer control. However, the patient must be committed to the labor-intensive rehabilitation process. He or she must also have adequate manual dexterity to perform self-catheterization should it become necessary<sup>6-8</sup>.

It is reasonable to advise against neo bladder reconstruction for a woman with invasive bladder neck involvement or suspected invasion of the vaginal wall or cervix. However, such patients may be considered for neo bladder diversion if intra operative frozen section of the urethral margin is negative. It appears that 60–70% of women undergoing RC might be candidates for OBS. OBS is an attractive option for selected women undergoing RC for Bladder Carcinoma. Oncologic outcomes appear to be excellent with appropriate selection criteria. Careful attention to patient selection, surgical technique, and follow-up are all-important to optimize functional results<sup>26</sup>.

Continent cutaneous diversion has a place as an option for reconstruction of the urinary tract in patients who undergo RC. However, in 2012 continent cutaneous UD is a second choice after OBS. The main indications seem to be patients in whom urethrectomy is required and in those in whom the prospect of possible urine leakage after OBS is repugnant. Multiple techniques have been described. However, many of them are too complicated to gain widespread acceptance. Simplicity characterizes the appendiceal outlet and the outlet of the different modifications of the Indiana pouch, and excellent functional results can be obtained. However,

complications from the pouch and the outlet are not infrequent. When involvement of the lower urinary tract by tumor excludes the use of a neobladder, a continent cutaneous reservoir may still offer some advantages over an ileal conduit. For patients who are not candidates for either type of continent diversion, the ileal loop remains a time-honored option<sup>27</sup>.

It is strongly recommended that RC and UD only be performed at high-volume hospitals (40–50 cases per year). It has been redefined to consider a minimum annual case load of 25 surgeries, performed by not more than two surgeons, to be the definition of a high-volume surgeon. Only an experienced team will master the challenges of RC and UD safely and guarantee a minimum of long-term complications by regular follow-up<sup>28</sup>.

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#### Abbreviations

- RC : Radical cystectomy  
 UD : Urinary Diversion  
 OBS : Orthotopic Bladder Substitution