LONG TERM METABOLIC COMPLICATIONS AFTER RADICAL CYSTECTOMY

ESSAY

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مَنْ عَمِلَ صَالِحاً مِّن ذَكَرٍ أَوْ أُنثَى وَهُوَ مُؤْمِنٌ فَلَنُحْيِيَنَّهُ حَيَاةً طَيِّبَةً وَلَنَجْزِيَنَّهُمْ أَجْرَهُم بِأَحْسَنِ مَا كَانُوا يَعْمَلُونَ

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AKNOLEDGEMENT

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List of Abbreviations

CIS	Carcinoma insitu
DIC	Disseminated intravascular coagulopathy
DVT	deep venous thrombosis
ED	Erectile Dysfunction
EGF	Epidermal growth factor
HPV	Human papilloma virus
IARC	International Agency for Research on Cancer
IVU	Intravenous urography
LRC	Laparoscopic Radical Cystectomy
NCI	National Cancer Institute
PCNL	Percutaneous nephrolithootomy
RC	Radical Cystectomy
SCC	Squamous Cell Carcinoma
TCC	Transitional Cell Carcinoma
UD	Urinary Diversion
UIAC	Union international against cancer
UTI	Urinary Tract Infection
WHO	World health organization

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INTRODUCTION

Urinary bladder cancer is a common disease worldwide. Urinary bladder cancer ranks ninth in the worldwide cancer incidence **(Ferlay et al., 2004).** It is the seventh most common malignancy in men and seventeenth in women. Approximately 357000 new bladder cancer cases (274000 males and 83000 females) occurred worldwide in 2002 **(Parkin, 2008).** At any point in time 2.7 million people have a history of Urinary bladder cancer **(Ploeg et al., 2009).**

Urinary bladder cancer is the second most common malignancy of all genitourinary tumors after prostate cancer and is nearly three times more common in men than in women **(Jemal et al., 2005).**

Bladder cancer is the fifth most common cancer in the United States. Incidence increased nearly 0.8% per year between 1975 and 1987 **(Rick Alter et al., 2008).**

Over 500000 individuals in the United States had urinary bladder cancer in 2004, and prevalence will likely increase as the population ages and treatment efficacy improves. Urinary bladder cancer is the fifth most expensive cancer (total costs) in the United States after breast, colo-rectal, lung, and prostate cancer, and consuming almost 3 billion dollars annually **(Konety et al., 2007)**.

Because of extended survival and ongoing monitoring needs, it is not surprising that urinary bladder cancer has the highest per-patient medicare costs (from diagnosis to death) of all cancers, with estimated per-patient lifetime costs of >96000 American dollar **(Botteman et al., 2003).**

In Egypt Carcinoma of the bladder is a main oncologic problem. At the National Cancer Institute (NCI), Cairo, urinary bladder cancer constitutes 30.3% of all cancers, 40.6% of male cancers, and 14.3% of female cancers **(El-Bolkainy, 2000)**.

According to the International Agency for Research on Cancer (IARC) statistical study: Egypt ranked first among Northern African and Arabian African countries in urinary bladder cancer incidence and mortality rates in both males and females **(Ferlay et al., 2004).**

Survival rate in cancer bladder increased yearly and a lot of complications developed after radical cystectomy and the metabolic aspect of these complication sometimes neglected by urologist like ***electrolytes imbalance, growth disorder, hyperamonia with altered sensorium, stones formation, drugs toxicity, malignant transformation, osteomalacia, and bacteruria***.

These complication may affect the survival and cure rates of the patients over the long term follow up and hence affecting the prognosis of the disease management.

AIM OF THE WORK

This study aims at evaluation and management regimens of long-term metabolic complications and outcomes, both functional and oncological, in patients treated with radical cystectomy and different types of diversion for invasive bladder cancer.

ANATOMY OF THE URINARY BLADDER

Anatomic Relationships

The urinary bladder of a normal subject is uncomfortably distended by half a pint of fluid. When fully distended, the adult bladder projects from the pelvic cavity into the abdomen, stripping the peritoneum upwards from the anterior abdominal wall. The surgeon utilizes this fact in carrying out an extraperitoneal incision or suprapubic puncture into the bladder. In children up to the age of about 3 years, the pelvis is relatively small and the bladder is, in fact, intra-abdominal although still extraperitoneal.

Urinary bladder when filled has a capacity of approximately 500 mL and assumes an ovoid in shape. The empty bladder is tetrahedral and is described as having a superior surface with an apex at the urachus, two inferolateral surfaces, and a posteroinferior surface or base with the bladder neck at the lowest point **(Brooks et al., 2007)**.

The urachus anchors the bladder to the anterior abdominal wall. There is a relative paucity of bladder wall muscle at the point of attachment of the urachus, predisposing to formation of diverticula. The urachus is composed of longitudinal smooth muscle bundles derived from the bladder wall. Near the umbilicus, it becomes more fibrous and usually fuses with one of the obliterated umbilical arteries. Urachal vessels run longitudinally, and the ends of the urachus must be ligated when it is divided. An epithelium-lined lumen usually persists throughout life and uncommonly gives rise to aggressive urachal adenocarcinomas **(Begg**

1930). In rare instances, luminal continuity with the bladder serves as a bacterial reservoir or results in an umbilical urinary fistula **(Brooks et al., 2007).**

The superior surface of the bladder is covered by peritoneum. Anteriorly, the peritoneum sweeps gently onto the anterior abdominal wall. With distention, the bladder rises out of the true pelvis and separates the peritoneum from the anterior abdominal wall. It is therefore possible to perform a suprapubic cystostomy without risking entry into the peritoneal cavity.

Posteriorly, the peritoneum passes to the level of the seminal vesicles and meets the peritoneum on the anterior rectum to form the rectovesical space **(Brooks et al., 2007).**

Anteroinferiorly and laterally, the bladder is cushioned from the pelvic side wall by retropubic and perivesical fat and loose connective tissue. This potential space (of Retzius) may be entered anteriorly by dividing the transversalis fascia and provides access to the pelvic viscera as far posteriorly as the iliac vessels and ureters. The bladder base is related to the seminal vesicles, ampullae of the vas deferentia, and terminal ureter. The bladder neck, located at the internal urethral meatus, rests 3 to 4 cm behind the midpoint of the symphysis pubis. It is firmly fixed by the pelvic fasciae and by its continuity with the prostate; its position changes little with varying conditions of the bladder and rectum **(Brooks et al., 2007).**

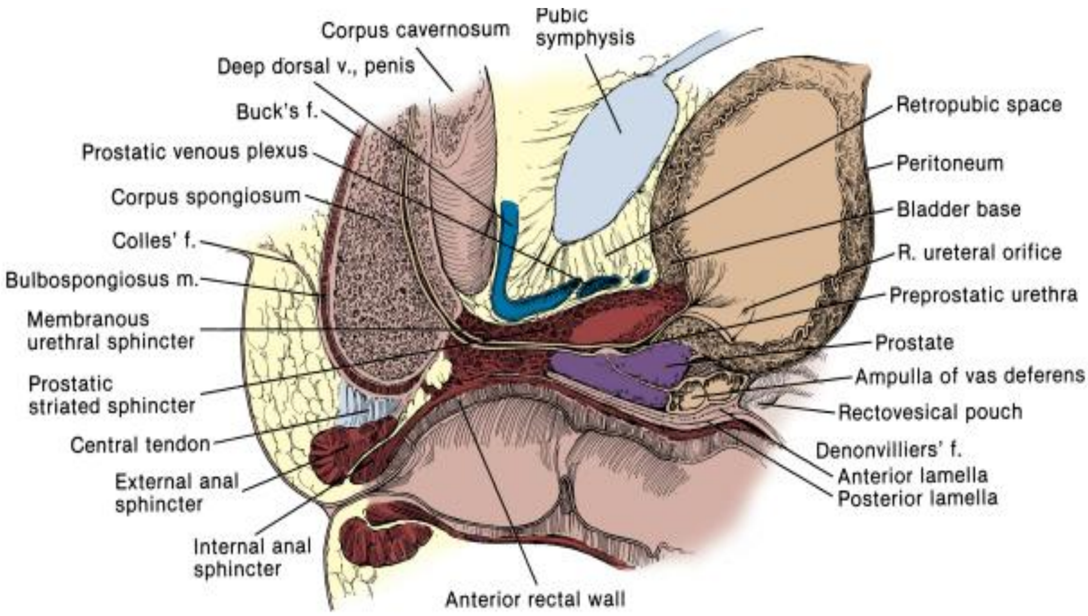

Fig. (1): Sagittal section through the prostatic and membranous urethra, demonstrating the midline relations of the pelvic structures (From Hinman F Jr: Atlas of Urosurgical Anatomy. Philadelphia, WB Saunders, 1993, p 356.).

In the female, the peritoneum on the superior surface of the bladder is reflected over the uterus to form the vesicouterine pouch and then continues posteriorly over the uterus as the rectouterine pouch. The vagina and uterus intervene between the bladder and the rectum, so that the base of the bladder and urethra rest on the anterior vaginal wall. Because the anterior vaginal wall is firmly attached laterally to the levator ani, contraction of the pelvic diaphragm (e.g., during increases in intra-abdominal pressure) elevates the bladder neck and draws it anteriorly. In many women with stress incontinence, the bladder neck drops below the pubic symphysis. In infants, the true pelvis is shallow and the bladder neck is level with the upper border of the symphysis. The bladder is a true intra-abdominal organ that can project above the umbilicus when full. By puberty, the bladder has migrated to the confines of the deepened true pelvis **(Brooks et al., 2007).**

Internal Structure

The internal surface of the bladder is lined with transitional epithelium, which appears smooth when the bladder is full but contracts into numerous folds when the bladder empties. This urothelium is usually six cells thick and rests on a thin basement membrane. Deep to this, the lamina propria forms a relatively thick layer of fibroelastic connective tissue that allows considerable distention. This layer is traversed by numerous blood vessels and contains smooth muscle fibers collected into a poorly defined muscularis mucosa. Beneath this layer lies the smooth muscle of the bladder wall. The relatively large muscle fibers form branching, interlacing bundles loosely arranged into inner longitudinal, middle circular, and outer longitudinal layers. However, in the upper aspect of the bladder, these layers are clearly not separable, and any one fiber can travel between each of the layers, change orientation, and branch into longitudinal and circular fibers. This meshwork of detrusor muscle is ideally suited for emptying the spherical bladder **(Brooks et al., 2007).**

Near the bladder neck the detrusor muscle is clearly separable into the three layers described earlier. Here, the smooth muscle is morphologically and pharmacologically distinct from the remainder of the bladder, because the large-diameter muscle fascicles are replaced by much finer fibers. The structure of the bladder neck appears to differ between men and women. In men, radially oriented inner longitudinal fibers pass through the internal meatus to become continuous with the inner longitudinal layer of smooth muscle in the urethra **(Brooks et al., 2007).**