Prostate Sparing Cystectomy versus Nerve Sparing Radical Cystectomy in Treatment of Invasive Bladder Cancer (A Prospective Randomized Controlled Study)

Thesis

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Mohamed Mahmoud Zaza

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List of Abbreviations

ASA	: American Society of Anesthesia
CIC	: Continuous intermittent catheterization
CIS	: Carcinoma in situ
CT	: Computed tomography
DDV	: Deep dorsal vein
DVT	: Deep venous thrombosis
ICSI	: Intra cytoplasmic sperm injection
IIEF	: International index of Eractile Function
IVP	: Intravenous pylography
MRI	: Magnetic resonance imaging
NCI	: National Cancer Institute
NSC	: Nerve sparing cystectomy
PSA	: Prostate specific antigen
PSC	: Prostate sparing cystectomy
QOL	: Quality of Life
RCT	: Randomized control studies
RF	: Renal failure
SD	: Standard deviation
SIF cells	: Small intensity florescent cells
sq. cc	: Squamous cell carcinoma
TCC	: Transitional cell carcinoma
TURP	: Transurethral resection of the prostate
WHO	: World Health Organization

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Introduction

Radical cystectomy continues to be the standard treatment for invasive as well as high grade or recurrent refractory cases of superficial TCC of the bladder.

However such surgery usually results in a substantial deterioration in the quality of life (QoL) of the patients because of the negative effects on continence and potency. This aspect is particularly important for surgery acceptance in young patients.

The neuro-anatomical studies and the consequent development of radical cystectomy with orthotopic neobladder with nerve sparing techniques resulted in a clear improvement in the final QoL of patients who underwent such surgery. However even in centers where nerve-sparing cystoprostatectomies are performed almost routinely, the probability of potency is no better than 50% and there is a constant 25%-30% incidence of nocturnal incontinence.

Therefore a technique of radical cystectomy and orthotopic bladder with sparing of the prostate has been developed in an attempt to improve the continence rate, potency and to maintain retrograde and possibly antegrade ejaculation.

Walsh described the anatomy of the pelvic innervation and showed how the neurovascular bundles containing cavernous nerves could be preserved during prostatectomy. Similarly the

nerve sparing cystoprostatectomy was developed after which various modified cystectomy techniques followed.

Spitz et al described a cystectomy with partial prostatectomy while preserving vasa deferentia, seminal vesicles and posterior prostate [152].

Muto et al [163] combined cystectomy with an adenoma enucleation according to Millin and Colombo et al. [157] and Vallancien et al. radical cystectomy preceded by transurethral resection (TUR) of prostatic tissue and prostatic urothelium with preservation of the prostatic capsule.

Aim of the Work

To evaluate the results of prostate sparing technique on cancer control, continence and potency in a selected group of sexually active patients with invasive bladder cancer in comparison with nerve sparing technique.

Anatomy

Anatomy of Urinary Bladder

The urinary bladder is a pelvic organ that is abdominal in position in young (< 6 years old) and a pelvic organ after the pelvis has developed sufficiently. It is situated behind the symphis pubis and depending on the degree of distension may be palpated in the lower abdomen[(1)]. While the body (fundus) of the bladder freely expands and contracts, the bladder neck is firmly fixed to the urethra and other ligaments in the deep pelvis[(1)].

When filled, the bladder has a capacity of approximately 500 ml and assumes an ovoid 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[(2)].

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 diverticula formation. The urachus is composed of longitudinal smooth muscle bundles derived from the bladder wall. Near the umbilicus[(3)].

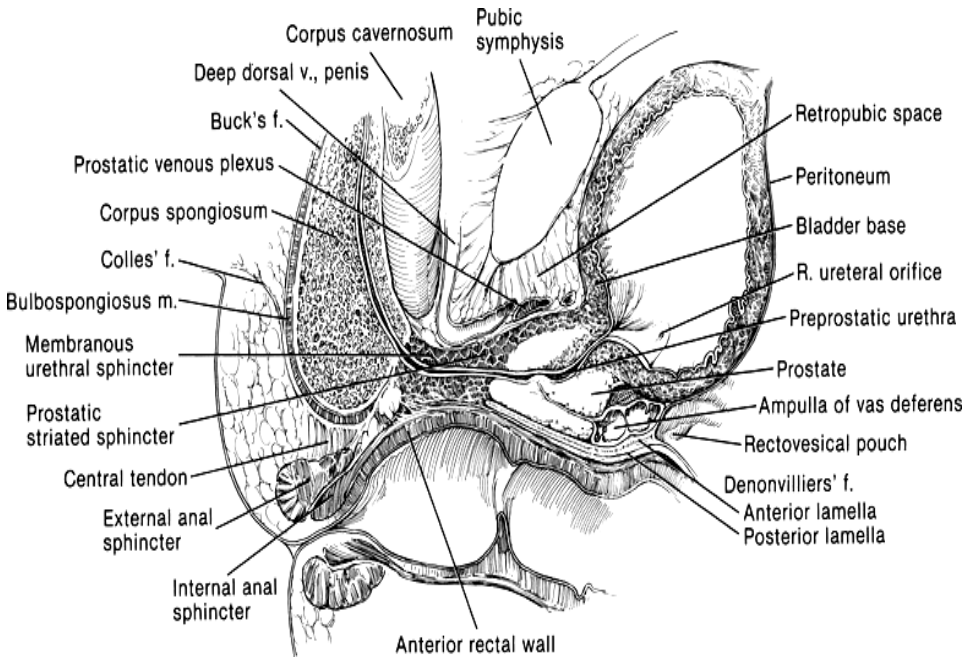

Figure (1): Sagittal section through the prostatic and membranous urethra, demonstrating the midline relations of the pelvic structures. ***(From Hinman F Jr: Atlas of Urosurgical Anatomy. Philadelphia, WB Saunders, 1993, p 356).***

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. In rare instances, luminal continuity with the bladder serves as a bacterial reservoir or results in an umbilical urinary fistula[4].

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. Posteriorly, the peritoneum passes to the level of the seminal vesicles and meets the peritoneum on the anterior rectum to form the rectovesical space[5].

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[4]. 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[6].

The lateral vesical ligaments are a continuation of the pelvic fascia and contain the inferior vesical artery and vesicodeferential arteries in the lateral extensions as\well as the vasa deferentia in males, and the pudendal plexuses of nerves and vessels. Inferiorly, this blends with the fascia of the obturator internus[6].

Aside of the fixation of the bladder to the lateral vesical ligaments or its base to the lateral pelvic wall and levator ani, the bladder is also fixed to the symphis pubis by the pubovesical ligaments in females, and pubo prostatic ligaments