MALE SLINGS FOR POSTPROSTATECTOMY URINARY INCONTINENCE

Thesis

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By

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بسم الله الرحمن الرحيم

وَقُــل رَّبِّ زِدْنِــي عِلْمـًا

صدق الله العظيم

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LIST OF ABBREVIATIONS

ACh	Acetylcholine
AR	Adrenoreceptor
AUS	Artificial urinary sphincter
BCG	Bacille-Calmette-Guerin
BCR	Bulbocavernosus reflex
BPH	Benign prostatic hyperplasia
CNE EMG	Concentric needle electromyography
CNS	Central nervous system
CSPANs	Caspaisin-sensitive primary afferent neurones
DLPP	Detrusor leak point pressure
EMG	Electromyography
eNOS	Endothelial nitric oxide synthase
ER	Extended release
ES	Electrical stimulation
ICS	International Continence Society
iNOS	Independent nitric oxide synthase
IR	Immediate release
nNOS	Neuronal nitric oxide synthase
NO	Nitric oxide
NOS	Nitric oxide synthase
OR	Odds ratio

LIST OF ABBREVIATIONS (Cont...)

Pabd	Intra-abdominal pressure
PAG	Periaqueductal grey
Pdet	Detrusor pressure = Pves-Pabd
PFMs	Pelvic floor muscles
PFMT	Pelvic floor muscle training
PMC	Pontine micturition center
PPA	Phenypropanolamine
PPI	Postprostatectomy incontinence
PPUI	Postprostatectomy urinary incontinence
Pves	Intravesical pressure
PVR	Postvoiding residual
RR	Risk ratio
SPN	Sacral parasympathetic nucleus
SUI	Stress urinary incontinence
TCA	Tricyclic antidepressant
TURP	Transurethral resection of prostate
UI	Urinary incontinence
UPP	Urethral pressure profile
UUI	Urge urinary incontinence
VLPP	Valsalva leak point pressure

INTRODUCTION

Postprostatectomy incontinence (PPI) is a devastating complication that is frustrating for both the patient and the surgeon. The specific incidence rate of postprostatectomy incontinence is difficult to ascertain. However, regardless of the type of prostatectomy; either being transurethral, transvesical or radical retropubic prostatectomy, or the nature of the prostate disease, several risk factors are common to all. The most significant risk factors include preexisting detrusor and/or sphincteric dysfunction, increasing age, and surgical expertise**.** ***(Diokno et al., ١٩٩٨).***

General management include behavioral techniques, pharmacological therapy and surgical intervention.As for surgical intervention, treatment options include placement of an artificial sphincter, collagen injections and male slings. The treatment of PPI continues to evolve with a notable preference towards the bulbourethral sling ***(Petrou et al., ٢٠٠٢).***

Currently, three different forms of male sling has been described: one using synthetic material and two using human fascia or dermis ***(Cespedes et al., ٢٠٠١).***

Being a disabling disorder, urodynamic studies in patients with PPI were reviewed to determine its etiology. Although sphincteric incompetence is the most common mechanism contributing to incontinence, bladder dysfunction may coexist or be an isolated cause of PPI. Therefore,

urodynamic studies are important to illustrate the exact cause(s) of incontinence in each individual patient. So that treatment based on the urodynamic evaluation is effective in restoring continence and improving the patient's quality of life ***(Winters et al., ١٩٩٨).***

AIM OF WORK

The aim of this study is to emphasize the role of bulbourethral slings in the treatment of PPI, as being a fast, less expensive and reliable method in comparison to other modalities.

ANATOMY

To understand postprostatectomy incontinence (PPI), it is first important to review the normal continence anatomy in the male, before and after prostatectomy. Normal continence in the male requires a stable, compliant detrusor, and a competent bladder outlet. Each of these anatomically distinct structures in turn requires normal innervation, normal smooth and striated musculature, and intact supporting structures and soft tissue components ***(Hadley et al., ١٩٨٦)***.

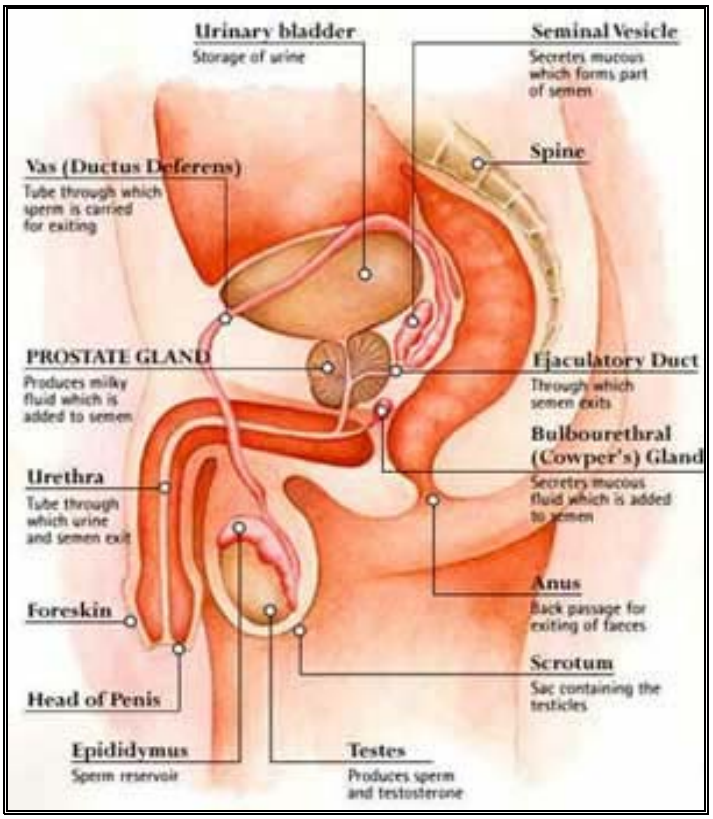

Figure (١.١): Sagittal section through the pelvis and perineum of an adult male ***(Light et al., ١٩٩٧)***

The urethral sphincter:

Traditionally, the urethral sphincter is considered to be composed of two components:

(١) **Proximal urethral sphincter**, which represents a direct continuation of the detrusor smooth muscle at the bladder neck and proximal urethra, consists of the bladder neck, prostate, and prostatic urethra to the level of the veromontanum. It is innervated by autonomic parasympathetic and sympathetic fibers. This portion of the continence mechanism is removed during prostatectomy, leaving only the distal sphincter to prevent urinary leakage ***(Brooks et al, ١٩٩٨)***.

A- The bladder neck:

The relatively large muscle fibers of the smooth muscle of the bladder wall form branching, interlacing bundles loosely arranged into inner longitudinal, middle circular and outer longitudinal layers. Near the bladder neck, the detrusor muscle is clearly separable into the three layers previously described. The large-diameter muscle fascicles are replaced by much finer fibers. In men, radially oriented inner longitudinal fibers pass through the internal meatus to become continuous with thinner longitudinal layer of the smooth muscle in the urethra (mentioned later). The middle layer forms a circular preprostatic sphincter that is responsible for continence at the

level of the bladder neck. This muscle is richly innervated by adrenergic fibers ***(Brooks et al., ١٩٩٨)***.

The outer longitudinal fibers are thickest posteriorly at the bladder base. In the midline, they insert into the apex of the trigone and intermix with prostatic capsule smooth muscles. Laterally, the fibers from this posterior sheet pass anteriorly and fuse to form a loop around the bladder neck, which is thought to participate in continence at the bladder neck. Some anterior fibers course forward to join the puboprostatic ligament ***(Delancey, ١٩٨٩)***.

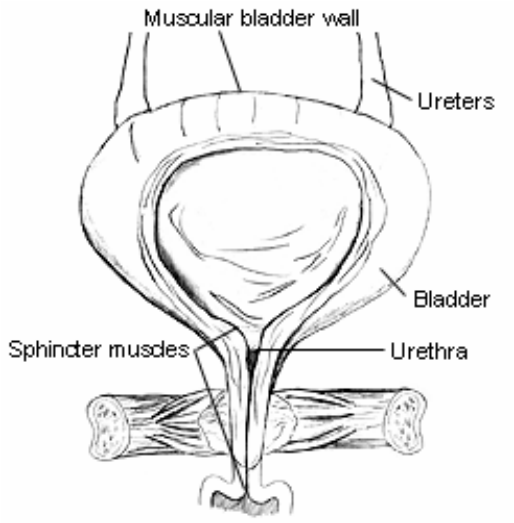

Figure (١.٢): Coronal section through the bladder, prostatic and membranous urethrae ***(Delancey, ١٩٨٩).***

B- The prostate and prostatic urethra:

The normal prostate weight ranges from ١٨-٢٢gm, measuring ٣cm in length, ٤cm in width, and ٢cm in depth and