Salwa Akl

بسم اللّه الرحمن الرحيم

مركز الشبكات وتكنولوجيا المعلومات

قسم التوثيق الإلكتروني

Salwa Akl

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

Salwa Akl

بعض الوثائق الأصلية تالفة
وبالرسالة صفحات لم ترد بالأصل

قـالـوا سبحانـك

لاَ عِلمَ لنا إلا ماَ علَمتنا إنكَ أنت العَليمُ الحَكيم

سورة البقرة آية ٣٢

ULTRASONOGRAPHIC MEASUREMENT OF BLADDER WALL THICKNESS IN PATIENTS WITH INFRAVESICAL OBSTRUCTION

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By

ALI MOHAMMED ALI ABDEL KARIM

MBBCh Alex.

Faculty of Medicine
Alexandria University

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SUPERVISORS

Prof. Dr. Salah El-Said Gaafar

Professor of Urology
Faculty of Medicine
Alexandria University

Prof. Dr. Mohamed Essam Marzouk

Professor of Urology
Faculty of Medicine
Alexandria University

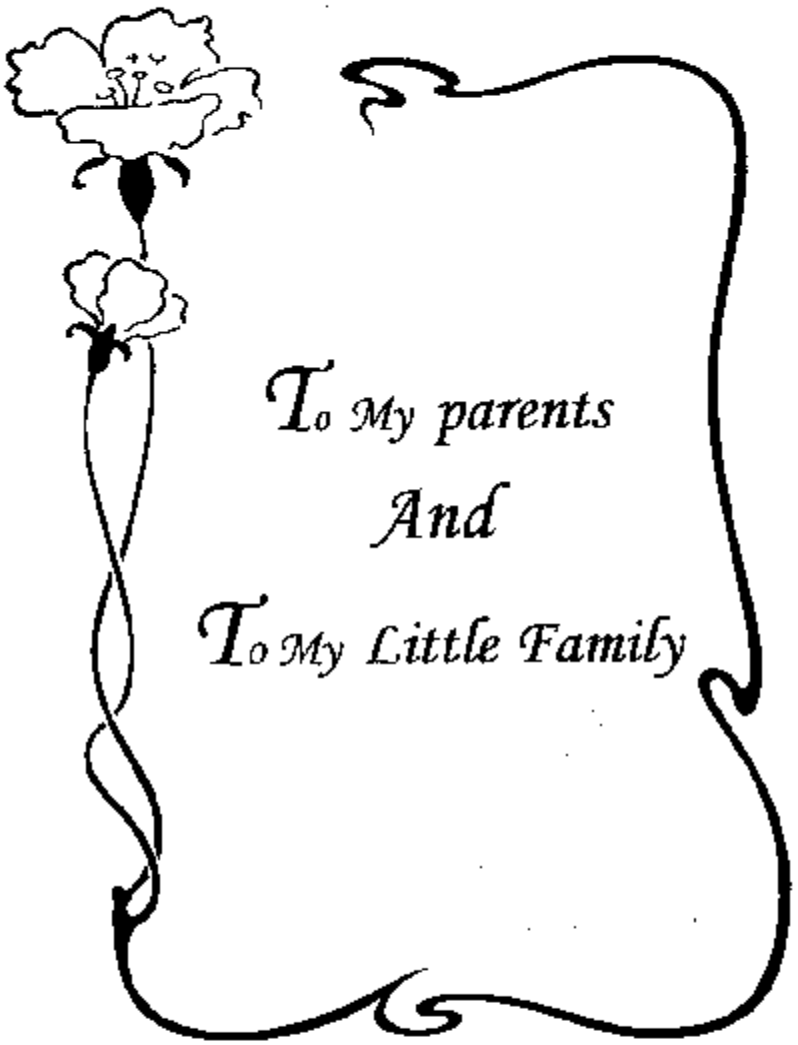
Dr. Khaled Mohamed Tawfik Fouda

Lecturer of Urology
Faculty of Medicine
Alexandria University

CO-WORKER

Dr. Hassan El-Brens Baddar

Lecturer of Radiodiagnosis
Faculty of Medicine
Alexandria University


To My parents
And
To My Little Family

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INTRODUCTION

Introduction

ANATOMY OF THE LOWER URINARY TRACT

The lower urinary tract consists of the urinary bladder and the urethra. The urinary bladder is a hollow viscous situated retropubically and suprapubically and serves two functions: namely storage and emptying of urine. Anatomically the bladder could be divided into two parts; the dome and the base. The bladder base is that part laying between the level of ureteric orifices and the bladder neck. The bladder neck is defined as the most inferior part of the bladder that leads to the urethra.

The urethra is a muscular tube extending from the bladder neck to the external urinary meatus. The urethral muscles by its configuration constitute two distinct mechanisms which are responsible for micturition and continence. These two mechanisms have been described according to their anatomical location as proximal and distal mechanisms. The proximal location lies at the level of the bladder neck, while the distal mechanism lies at the level of the urogenital diaphragm. Coordination between these two

mechanisms and the bladder musculature is essential for proper micturition to occur.

The detrusor muscle:

The detrusor muscle consists of smooth muscle bundles, the arrangement of which has been a subject of great debate. When examined microscopically, the detrusor muscle shows three different layers of smooth muscles namely, an outer longitudinal, a middle circular and an inner longitudinal layer[1-4]

On the other hand, some authors suggested that there is no separate three muscular layers but rather only one layer whose muscle bundles are perusing various directions, that is why it appears as three layers on histological sectioning. In other words, the apparently longitudinal surface bundles, after passing through different decussation and undergoing consequent arrangement form the circular layer and then ultimately ends as the inner longitudinal muscle layer.[5-7] This view is shared by Gosling et. al.[8,9] who stated this arrangement is ideally suited to cause reduction in all dimensions of the bladder on contraction of the muscle coat.

The trigonal musculature:

The trigone proper consists of two muscular layers which are superimposed over the detrusor muscle. The superficial layer (the superficial trigone) is a direct continuation of the ureteric muscles.[7] It is formed by the union of the longitudinal fibers in the floor of the intravesical ureter as they continue uninterrupted into the trigone. Below the ureteral orifice this sheet of muscles fans out and the upper fibers run transversely to the corresponding fibers from the other side, while the lower fibers pass downwards and medially passing over the posterior lip of the internal meatus to fuse with the fibers from the other side. All the fibers continue downwards through the entire length of the urethra in the female; while in the male most of the fibers are inserted into the verumontanom where they fuse with the musculature of the ejaculatory duct. [10]

The second trigonal layer (the deep trigone) is a direct continuation of Waldeyer's sheath, which is a fibromuscular structure that completely encircles the distal 3 to 4 centimeters of the juxtavesical ureter and follow the ureter through the ureteral canal.[7] This sheath together with its mate from the other side as well as variable contributions from the detrusor muscle, form a roughly triangular sheet of muscle that lies deep to the superficial layer.

The superficial and the deep trigonal layers, being a direct continuation of the ureteric muscles and the Waldeyer's sheath, are essentially mesodermal in origin as opposed to the detrusor muscle which is endodermal in origin. However, because the deep trigone receives variable contributions from the detrusor muscle, there is a link between these closely related yet embryologically distinct structures.[11]

The internal vesical sphincter:

This is one of the most controversial areas in urology. The controversy is not only how it functions but also on its mere existance. Its existence was denied by many authors on the ground that embryologically it has the same origin as the bladder and that there is no fetal stage that show any specialization at the transition region which forms an internal urethral or vesical sphincter.[6,7,12,15] Its existence was also denied on anatomical basis as it was found that vesical musculature was found to pass uninterrupted to the urethra.[4,5,6,8] On the other hand, the existence of an internal sphincter as an anatomical entity was confirmed by many authors.[16]

However, some authors came up with the idea of a functional internal vesical sphincter. According to Wesson,[17] the sphincteric action is produced by two loops of smooth muscle, an anterior

loop from the dorsal external longitudinal layer of the detrusor muscle and a posterior loop arising from the middle circular layer.

Striated muscles of the male urethra:

It is divided into an extrinsic and intrinsic parts.

The extrinsic part, is also called the periurethral muscle, which is actually a part of the pelvic diaphragm, lies in a horizontal plane (in man), is separated from the urethral wall by a connective tissue plane, and corresponds to the so called external urethral sphincter.[18] Its muscle fibers are different from those constituting the intrinsic part in being twice as much in diameter, in being fast twitch, and in having a different nerve supply.[8,19]

The intrinsic part of the striated sphincter, which is also called the rhabdosphincter, was ignored for many years by anatomy textbooks which described the extrinsic part as the only component, ignoring the functionally more important rhabdosphincter. [20]

Anatomical description of the human rhabdosphincter is available in both the old and recent literature. [21-24] In the male the rhabdosphincter was described as consisting of three parts:

a) A caudal part that forms a complete ring of obliquely oriented fibers around the membranous urethra, and is totally integrated in its wall.
b) A middle prostatic part that extends longitudinally along the anterior surface of the prostate.
c) A cranial part in which the muscle fibers extend along the anterior surface of the prostate and turn around the bladder neck to interdigitate with the posterior bundle of the detrusor base.

This was supported by the presence of skeletal muscle fibers in samples of transurethral resection (TUR) of the bladder neck,[25] and functionally as the bladder neck has been observed cystoscopically to contract in response to electrical stimulation of the pudendal nerve. [26,27]

Peripheral innervation of the lower urinary tract:

The bladder and urethra are supplied by visceral afferent and efferent axons that traverse the thoracolumber and sacral nerves, namely T12 - L2 and S2 - S4 respectively. In addition, the striated external urethral sphincter receives somatic efferents and afferents via the pudendal nerve from sacral spinal nerves usually S2 - S4. Precise segments of origin vary among individuals according to plexus design, that is in some individuals nerves originate about a