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قسم

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ROLE OF TRANSRECTAL ULTRASONOGRAPHY IN EVALUATION OF PROSTATIC DISORDERS

Thesis

Submitted in Partial Fulfilment of the Requirements of the M.D Degree in
"Radiology"

By

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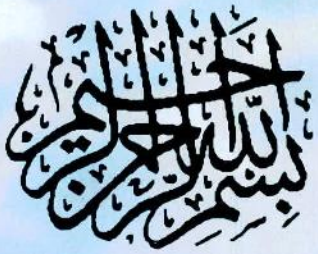

قُلْ هُوَ اللَّهُ أَحَدٌ ﴿١﴾ اللَّهُ الصَّمَدُ ﴿٢﴾ لَمْ يَلِدْ
وَلَمْ يُولَدْ ﴿٣﴾ وَلَمْ يَكُن لَّهُ كُفُوًا أَحَدٌ ﴿٤﴾

صدق الله العظيم

﴿ سورة الاخلاص ﴾

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CONTENTS

LIST OF ABBREVIATIONS

ACS : American Cancer Society .

AIDS : Acquired immune deficiency syndrome.

AUA : American urological Association .

BPH : Benign prostatic hyperplasia .

CNS : Central nervous system.

CT : Computerized tomography .

CZ : Central zone .

DHT : Dihydrotestosterone.

DRE : Digital rectal examination .

DRE+ : DRE is suspecious for cancer

DRE- : Digital rectal examination is not suspecious for cancer.

E-coil : Endorectal coil

EVAP : Ellipsoid volume with the transverse diameter representing the lenghth determined by the distance markers.

EVTV : Ellipsoid volume with the transverse diameter representing the lenghth determined by the distance markers .

F-PSA : Free serum prostate specific antigen .

FN : False negative .

FP : False positive .

HWL : Height , width and lenghth.

MHz : Mega Hertz.

MRI : Magnetic resonance imaging.

NPV : Negative predictive value.

PBR : Positive biopsy rate.

PPV : Positive predictive value .

PSA : Prostate specific antigen.

PSA+ : Elevated serum prostate specific antigen.

PSA-ACT: Prostate specific antigen- Alpha-1- antichemotrypsin.

PSAD : Serum prostate specific antigen density .

PSAF : Prostate specific antigen factor .

PSAT(PSA-TZ): Prostate specific antigen adjusted for the volume of the transition zone .

PVP : Periprostatic venous plexus

PZ : Peripheral zone .

SD : Standard deviation.

SE : Standard error .

SEER : Surveillance , epidemiology, and end results of the National Cancer Institute.

TN : True negative.

TNM : Tumor , node and metastasis .

TP : True positive .

TRUS : Transrectal ultrasonography.

TRUS+: Transrectal ultrasonography is suspecious for cancer.

TZ : Tranzition zone .

INTRODUCTION

The prostate is an exocrine gland composed of both glandular and nonglandular tissue. It is the most frequently diseased organ in men. The American Cancer Society estimated that there would be 334.500 new cases of prostate cancer in the United States in 1997 [Wingo et al., 1997] [1]. For benign prostatic hyperplasia (BPH), it is estimated that 17% of men aged 50-59 years, 27% of men aged 60-69 and 35% of men aged 70-79 will have symptomatizing benign prostatic hyperplasia [Jacobson et al., 1995][2].

A variety of conventional radiological techniques have been used for imaging of the prostate. Intravenous urogram, voiding cystourethrogram and retrograde urethrogram - but depending on evidence of prostatic enlargement or contour distortion to identify prostate pathology, they thus have a very limited role in the evaluation of prostatic disease [Carter et al., 1989] [3].

Recent development in ultrasound technology have made ultrasound one of the most reliable diagnostic modalities for evaluation of the prostate via the suprapubic, perineal, transurethral and transrectal approaches [Lee et al., 1987] [4].

Transrectal ultrasonography has emerged as the best imaging modality of the prostate. It is used for screening, diagnosis, staging and monitoring of prostate cancer and for guiding biopsy from suspicious lesions [Kammermier , 1991] [5].

The image of the prostate produced by modern transrectal ultrasound shows the peripheral and central zones of the prostate,

each anatomic zone has a particular sonographic appearance that reflects the architecture of the zone [McNeal, 1981] [6]. Transrectal ultrasonography appears to be a simple, non invasive and reproducible way of assessing prostatic volume in accuracy of 80-87% [Terris and Stamy, 1991] [7].

The value of detection of prostate cancer using transrectal ultrasonography is well known. Staging of prostate cancer is possible by transrectal ultrasnography through its capacity to characterize the tumor volume, location and extent [Lee and Rholl, 1986] [8].

AIM OF THE WORK

The aim of the present study is to evaluate the role of transrectal ultrasonography in the diagnosis of various prostatic diseases.

EMBRYOLOGY

About the fourth week of gestation the urogenital septum divides the cloaca into two parts: The rectum posteriorly and the primitive urogenital sinus anteriorly [Wilson , 1970] [9].

In the fifth week, the distal protions of the wolffian canal (which drains the mesonephric tube) and the mullerian canal 9paramesonephric tube) attach to the posterior aspect of the primitive urogenital sinus, this attachment forms an elevation called mullerian tubercle which is the origin of the verumontanum [Wilson , 1970] [9].

The mullerian tubercle divides the primitive urogenital sinus into vesico-urethral canal superiorly and definitive urogenital sinus inferiorly. The vesico-urethral canal gives the urinary bladder and the proximal posterior urethra. The definitive urogenital sinus forms the distal urethra [Wilson , 1970] [9].

The wolffian canal forms the vas defferens, the ampulla of the vas and the seminal vesicle. The mullerian canal regresses and it persists as a small blind cavity within the mullerian tubercle called the utricle [McNeal , 1983] [10].

Formation of the prostate begins in the tenth week of gestation by proliferation of the epithelium of the posterior urethra around the orifices of the wolffian canal to surround the urethral circumference, the prostatic glands are dominant posteriorly. The prostatic glands which are formed anterior to the urethra regress and are replaced by firomuscular stroma. The tubes of the prostatic gland open in the

urethra around the mullerian tubercle. The secretory function of the glands starts about the thirteenth week of gestation [Brandes 1989][11].

In the male fetus, the cranial portions of the mullerian ducts involute as a result of secretion of an antimullerian factor by the sertoli cells of the testes. The most caudal remnants persists as a well defined tube which units with the posterior wall of the urogenital sinus to form the utricla plate [Zagoria and Tung , 1997] [12].