Does the use of Povidone Iodine Suppositories decrease the infective complications of TRUS guided prostate biopsies? A randomized prospective study

Thesis

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List of Abbreviations

Abb.	Full term
BPH	Benign prostatic hyperplasia
CRP	C reactive protein
CZ	Central zone
DM	Diabetes mellitus
DRE	Digital rectal examination
E. coli	Escherichia coli
HTN	Hypertension
PSA	Prostatic specific antigen
PZ	Peripheral zone
TLC	Total leucocytic count
TRUS	Transrectal ultrasound
TRUS-Bx	Transrectal ultrasound guided prostate biopsy
TURP	Transurethral resection of the prostate
TZ	Transitional zone
US	Ultrasound
UTI	Urinary tract infection

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INTRODUCTION

Prostate cancer is the second most common cancer and the sixth leading cause of cancer deaths worldwide with an estimated 899,000 cases and 258,000 deaths annually. By 2030, these rates are anticipated to increase to 1,700,000 and 499,000 ***(Center et al., 2012).***

Prostate cancer has been the most common noncutaneous malignancy in U.S. men since 1984, now accounting for 27% of all such cancers ***(Siegel et al., 2014).***

In Europe, prostate cancer represents the most common non skin cancer among elderly males (>70 years) being of higher incidence in northern and western Europe (200 per 100.000) ***(Arnold et al., 2015).***

Prostate cancer incidence varies according to Race/ ethnicity with African-Americans incidence rates 59% higher than incidence rates among whites. African-Americans and Jamaicans of African descent have the highest incidence rates in the world ***(Siegel et al., 2014)***.

Prostate cancer is rarely diagnosed in men less than 50 years of age, accounting for only 2% of all cases. Prior to the PSA era, median age at diagnosis was 70 years, falling to 67 years over the past decade, with 63% diagnosed after age 65 ***(Ries et al., 2008)***.

Diagnosing prostate cancer rely on prostatic specific antigen (PSA) testing, digital rectal examination (DRE) and obtaining prostate biopsy for histopathological examination by transrectal Ultrasound guidance (TRUS) or Magnetic Resonance imaging diffusion techniques.

Prostate biopsy:

Obtaining prostate biopsy is the cornerstone in managing prostate cancer. It could be done using transrectal ultrasound guidance, transperineal ultrasound guidance or multiparametric MRI targeting. TRUS guided prostate biopsy is more feasible and less expensive than MRI.

TRUS of the prostate was first described by ***Watanabe and colleagues 1968***. TRUS evolved in the last 2 decades to become a fundamental tool in urology specially in management of prostate cancer which relies on many image guided interventions including prostate biopsy for both diagnosis and active surveillance, brachytherapy, cryotherapy and high-intensity focused ultrasound (US). TRUS guided placement of radiofrequency markers is mandatory in radiation therapy for real-time tumor tracking of the prostate ***(Linden et al., 2009; Das et al., 2014).*** Recently, a new use of TRUS is being implemented by injecting Polyethylene glycol hydrogel into anterior perirectal fat to decrease radiotoxicity in radiation therapy ***(Strom et al., 2014).*** TRUS has its valuable usage in some other benign cases as in evaluating treatment options in

benign prostatic hyperplasia (BPH) and some cases of infertility.

The use of digitally directed prostate biopsy, common until the late 1980s, evolved into the expanded clinical use of TRUS-directed prostate biopsies. TRUS-guided systematic sextant (six cores) biopsy protocol was described by ***Hodge and Associates (1989).***

Now the standard technique is 10-12 biopsies ***(Donovan et al., 2003).***

AIM OF THE WORK

The aim of this study is to assess the prevalence of different organisms among rectal flora in our community and the virulence of the most prevalent one. We will study the effect of combined standard antibiotic prophylaxis with and without the use of povidone iodine suppository prior to TRUS guided biopsy of the prostate in decreasing post biopsy complications specially infectious ones.

Chapter 1

ANATOMY OF THE PROSTATE

Gross anatomy:

The prostate gland is ovoid in shape (walnut), measures 3 cm in length, 4 cm in width, and 2 cm in depth and weighs 15 – 20 g. it lies below the urinary bladder where its base starts and prostate continues downwards till its most distal portion forming the apex at the level of urogenital diaphragm. The apex is in continuity with the striated urethral sphincter (**Fig. 1**)

A capsule made of collagen, Elastin and smooth muscle fibers encases the prostate except for the base and the apex and continues with the extension of the endopelvic fascia at the anterior and anterolateral surfaces of the prostate ***(Epstein, 1989).***

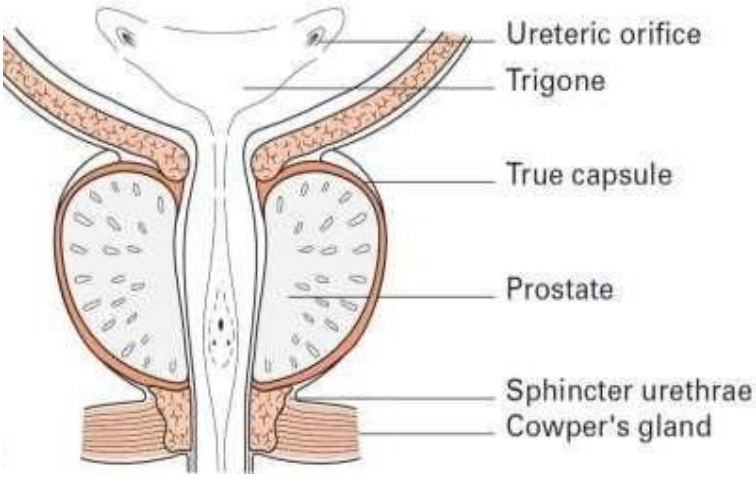

Fig. (1): Normal prostate in vertical section ***(Ellis and Mahadevan, 2013).***

Relations:

The prostate is fixed to the pubic bone anteriorly by the puboprostatic Ligaments near the apex of the prostate. The superficial branch of the dorsal vein is positioned in the retropubic fat outside the prostatic fascia. It drains into the dorsal vein complex.

The levator ani's pubococcygeal portion hugs the lateral aspects of the prostate and is related to its overlying endopelvic fascia. The prostate capsule and the pelvic fascia separate below the parietal and visceral endopelvic fascia juncture (**Fig. 2**).

Fatty, areolar tissue and the lateral branches of the dorsal vein complex take up the space of this separation between the prostate capsule and the pelvic fascia. The cavernosal nerves travel within the parietal pelvic fascia, also known as the lateral prostatic fascia, posterolateral to the prostate. Posteriorly, the prostate is related to ampulla of the rectum and pierced by ejaculatory ducts to open in prostatic urethra ***(Walz J. et al., 2007).***

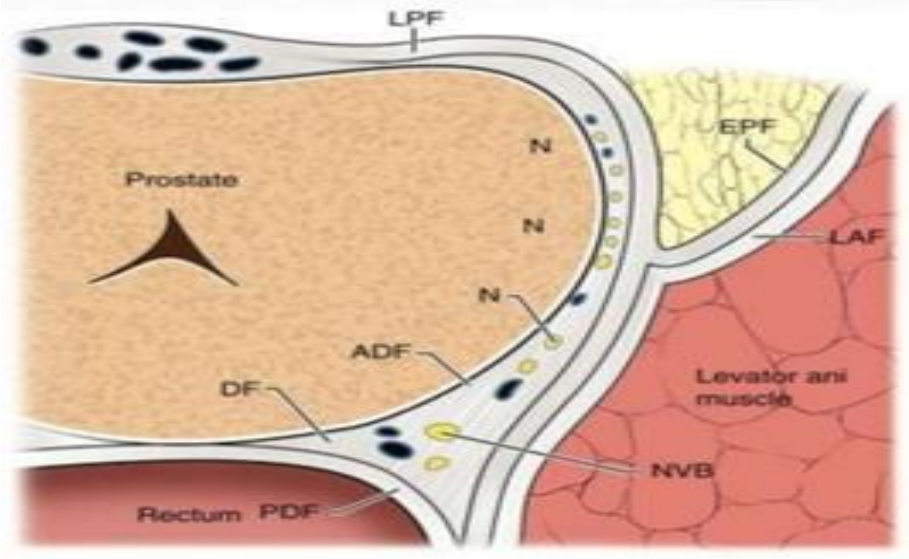

Fig. (2): Cross section of prostate with prostatic fascial layersoutlined, including the lateral prostatic fascia (LPF), endopelvic fascia (EPF), levator ani fascia (LAF), Denonvilliers fascia (DF), anterior lamina of Denonvilliers fascia (ADF), posterior lamina of Denonvilliers fascia (PDF), neurovascular bundle (NVB), and lateral nerves (N) ***(Walz J. et al., 2007).***

Zonal anatomy:

The Prostate is divided into 3 distinct zones according to **McNeal's concept** of zonal architecture ***(McNeal, 1981)*** (**Fig. 3**).

- **Transition zone**. The transition zone comprises 5% to 10% of the glandular tissue of the normal prostate. It is separated from other glandular compartments by a fibromuscular band. It surrounds the proximal urethra and is the region of the prostate gland which grows throughout life and is commonly responsible for the disease of benign prostatic enlargement