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Prostate Enlargement and Voiding Positions: A Mini- Review

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Abstract

Worldwide prostate enlargement is one of the major global health issues whose prevalence is age dependent in men and can be handled with lifestyle modifications along with proper clinical management. Emptying the urinary bladder to maximum in relation to voiding positions in patients of prostate enlargement remains the point of concern. A systemic search review was conducted through various medical database and various research studies related to voiding positions in males were compared and included and is concluded that body position during micturition do influence the maximum urinary flow rate during prostate gland enlargement. A better understanding of the voiding positions is a prerequisite for the development of novel, more effective medical treatment and comfort option for the patients who have undergone the prostate surgeries or already in state of surgery or at the first step of its benign enlargement and on the medication.

Key Words

Prostate, Men, Gland Enlargement, Benign, Voiding Positions, Anatomical Facts

Introduction

Walnut-shaped shaped prostate is fibro-muscular glandular organ having weight of approximately 3gms, is an important part of the male reproductive system which is essential for male's fertility, as it secretes a fluid that goes into semen. Anatomically (Fig.1) , it surrounds the urethra at the neck of the urinary bladder, having four lobes namely *anterior* (isthmus, band of fibrous tissue, connecting two lateral lobes), *posterior* (lies behind the ejaculatory ducts and median lobe, site of primary carcinoma) , *median* (lies behind the upper part of the urethra and Infront of ejaculatory ducts, because of much glandular tissue it is the common site of adenoma) and *lateral* (lies on each side of the urethra, contains some glandular tissue thus adenoma may arise here in old age). The prostate is enclosed by an outer layer of tissue, and it is present in front of the rectum, just below the bladder and is supported by urogenital diaphragm, pair of

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puboprostatic ligaments and rectovesical fascia. Prostate is devoid of adipose tissue and with abundant smooth muscle fibres. Moreover, wide variety of alteration can be seen in its epithelium and stroma in human prostate gland and every lobe have distinct histology such that different thickness in different lobe. Other structures present in relation to the prostate gland are ductus deferens, ganglia, urinary bladder, and urethra. (Panner, 2010; Gray, 2013; Deters, 2014).

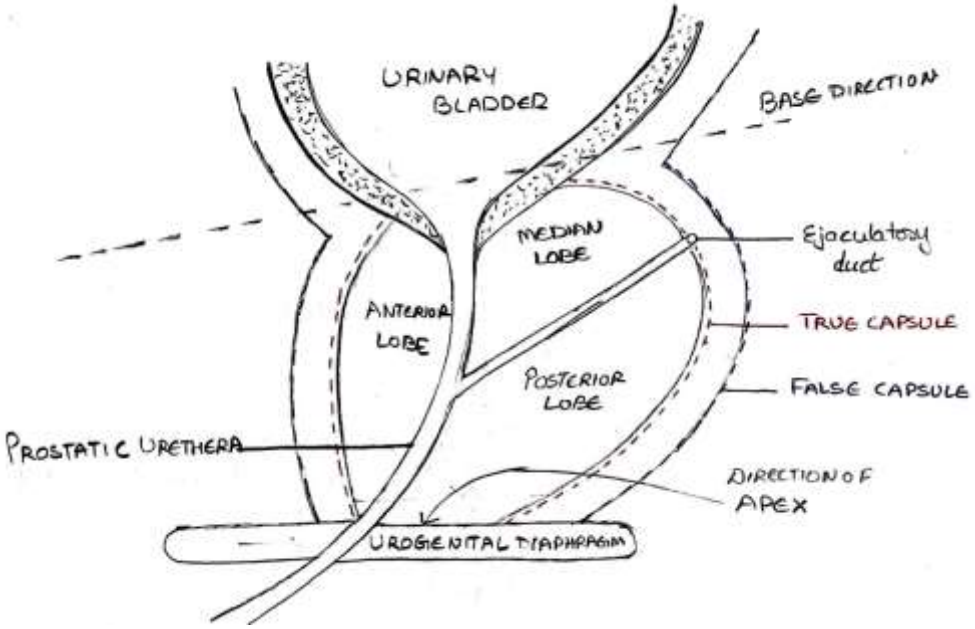

Fig.1 Anatomy of Prostate Gland (Sagittal Section)

Prostate Enlargement

With advancing age, the amount of active testosterone in men's blood decreases, which leaves a higher proportion of estrogen which further increases the activity of substances that promote prostate cell growth and as a result prostate enlarged. The enlarged prostate presses against and pinches or narrowing the urethra and obstruct the urinary flow due to which the bladder wall becomes thicker, may weaken, and lose the ability to empty completely, leaving some urine in the bladder and cause many of the problems associated with benign prostatic hypertrophy (BPH).Benign Prostate Hypertrophy (BPH) also known as benign prostatic hyperplasia or benign prostatic hypertrophy or benign prostatic obstruction is the most common benign tumour in men remains a global health issue with advancing age. The prostate goes through two main growth phases in man's life, first occurs early in puberty during which the prostate doubles in size and second phase of growth begins around the age of 25 years and continues

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during most of a man's life. Benign prostatic hypertrophy (BPH) often occurs within the second growth phase of prostate. More than 50% of men over 50 years and 90% of patients over 80 years suffer from BPH, the condition in which the prostate gland is enlarged and not cancerous (Rullis et al.1975; Berry et al.1984; Sakr et al.1994; Tanagho et al., 2003; Deters, 2014; Yim et al.,2015; McCaughan et al., 2018).

Acute Urinary Retention (AUR)

Benign prostatic hyperplasia is the cause for the acute urinary retention (AUR) in at least 65% of men presenting with AUR (Elhilali et al., 2004) and is associated with significant anxiety, discomfort, and patient's inconvenience. Its impact on patients' health-related quality of life is comparable to an attack of renal colic (Thomas et al., 2005). The main cause of acute urinary retention can be classified into three categories: firstly, any event which increases the resistance to the flow of urine, secondly interruption of bladder innervation and thirdly any situation which causes the bladder to over-distend. Use of non-steroidal anti-inflammatory drugs (NSAIDs) are known to have a direct effect on prostaglandin synthesis (especially PGE2) which plays an important role in contractions of the detrusor muscle (Barclay, 2005). Acute urinary retention related to benign prostate hypertrophy may be sequential to a sudden stimulation of alpha 1 - adrenergic receptors and the use of alpha blockers acts on the ‘‘dynamic’’ component of urinary bladder outlet obstruction by relaxing smooth muscle fibres located in the prostate and its capsule, bladder neck and prostatic urethra in BPH (Caine et al.,1975).

Anatomical Basis of Voiding Positions

Patients of prostate enlargement may find it harder to start and stop urinating, their urine streaming is not as strong as it used to be and they feel like they need to urinate often and even have the feeling of urinating thereafter. Failed to empty the urinary bladder leads to raise the level of stress which further shows its adverse effect on the progression of the disease. For men, the preferred position of voiding is dependent on several variables, including the type of available toilet facility, social behaviour, and associated musculoskeletal comorbidities. For example, a man may void in a sitting or standing position at home on a commode but may void in a standing position while in the office or outdoors. But uncertainty remains whether it is best for men to void in a sitting or standing position and how to determine the best voiding position. It has been observed that voiding habits of eastern and middle eastern countries are sitting and standing positions which were explained based on ritual or religious aspects but various studies

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opposing results of these theories still exist (Yamanishi et al. 1999; Unsal et al. 2004; Aghamir et al. 2005).

The first medical description of the influence of voiding position on bladder health dates from 1883 (Barnes,1883). Anatomically, contraction of the pelvic muscles is related to a disturbed urinary flow, so voiding position is very important to consider in the patients of prostate enlargements. The relaxation of pelvic muscles is better achieved by urinating in a sitting position during which muscle tension in the medial and anterior compartments of the hip is decreased (Wennergren et al., 1991; Rane, 2000; Uluocak et al.,2008; Salem et al.,2009; Amjadi et al.,2011).

Contraction of the detrusor is needed for urination; consequently, increased activity of the pelvic floor musculature negatively influences urodynamics. Common innervation (from the sacral plexus) of the anal sphincter and the pelvic floor musculature is associated with an increased activity of the pelvic floor muscles when anal sphincter contracts. So, in standing position (especially in public conveniences), the desire not to lose defecation or flatus can lead to increased activity of the pelvic floor musculature and consequently impaired micturition (Al-Hayek et.al.,2008; EL-Bahnasawy and Fadl, 2008; Salem et al.,2009; Amjadi et.al.,2006, 2011). The meta-analysis of various past studies concluded that patients with lower urinary tract symptoms (LUTS) performed better in the sitting voiding position than in the standing position. On the other hand, according to Yazici et al. (2013), uroflowmetric evaluation does not highlight any clinically important difference among different voiding positions either sitting or standing and further suggested that it should be left to the personal preference of the patient.

Conclusion

Strengthening the pelvic floor muscles and reducing pelvic tension can help improve bladder control, making it easier to urinate, which can be attained by life style modifications. Changing the voiding position may have an effect that is equivalent to the effects of pharmacological management. Voiding in the sitting position in comparison to standing is found to be the optimal position for elderly men as it is found to lower the post-void residual urine volume and is more comfortable but still medically preferable urinating posture for emptying the urinary bladder to maximum is controversial.

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