

Open Journal of Urology



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ISSN 2160-5440 (Print) ISSN 2160-5629 (Online) https://www.scirp.org/journal/oju

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March 2022

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A Review on Urinary Incontinence after Surgery for Benign Prostatic Hyperplasia

Constantin Martial Essissima Foé, Yunfen Liao, Guoxi Zhang

First Affiliated Hospital of Gannan Medical University, Ganzhou, China Email: cessissimafoe@yahoo.fr, lyf130@126.com, gyfyurology@126.com

How to cite this paper: Foé, C.M.E., Liao, Y.F. and Zhang, G.X. (2022) A Review on Urinary Incontinence after Surgery for Benign Prostatic Hyperplasia. *Open Journal of Urology*, **12**, 169-184. https://doi.org/10.4236/oju.2022.123017

Received: February 1, 2022 Accepted: March 4, 2022 Published: March 7, 2022

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Abstract

Background: Benign prostatic hyperplasia (BPH) is characterized by the abnormal proliferation of cells, leading to structural changes. It is one of the most common diseases in ageing men. Its clinical presentations are dominated by lower urinary tract symptoms (LUTS). The therapeutic methods can be grouped into two options: the medical option and the surgical option in which prostate enucleation is found. In recent years many studies have reported the onset of urinary incontinence (UI) after prostate enucleation. The management of UI occurring after prostate enucleation is embarrassing for both the practitioner and the patient, and generates additional costs. Purpose: Cite the causes of UI after prostate enucleation for BPH, as well as ways to prevent the onset of UI after this surgery, specifically by the study of the vesicosphincteric system aimed at improving the technique of enucleation; our review will also deal with the therapeutic means of UI. Method: We retrieved studies from Science Direct, Wiley and Pubmed. Results: There are multiple etiologies of UI after prostate enucleation including urethral sphincter insufficiency (USI) and bladder dysfunction (BD). The management of UI after surgery could be conservative, surgical, or use new technologies. Urodynamic assessment before prostate enucleation for BPH is relevant. Conclusion: UI is a common post-operative complication of prostate enucleation. The study of the vesicosphincteric system leads us to believe that prostate enucleation for BPH, partially sparing the mucosa and the external urethral sphincter could decrease the incidence of UI after surgery.

Keywords

Benign Prostatic Hyperplasia (BPH), Urinary Incontinence (UI), Urethral Sphincter Insufficiency (USI), Bladder Dysfunction (BD), Detrusor Overactivity (DO), Prostate Enucleation

1. Introduction

Prostate adenoma or benign prostatic hyperplasia (BPH) is a new formation developed at the expense of prostate gland. Pathologically, BPH is characterized by the abnormal proliferation of cells (hyperplasia), leading to structural changes which can consist of stromal tissue, fibroblasts, smooth muscle cells and fibromuscular stroma or glandular tissue [1] [2]. The prevalence of BPH increases with age and it is one of the most common diseases in ageing men [3] [4]. Studies have observed histological prevalence of 9%, 50% and 80% in the 4th, 6th and 9th decades of life, respectively [5]. Racial and ethnic variations are not evident in the incidence of BPH and symptoms severity [6]. It has been observed that lifestyle can modify the natural history of BPH [7] [8].

Its clinical presentations are dominated by lower urinary tract symptoms (LUTS) [9] [10] which can be classified in voiding symptoms (obstructive) and storage symptoms (irritative). International Prostate Symptoms Score (IPSS) and Quality of Life (QoL) index show objectively the severity of LUTS and the most bothersome symptoms. There are various therapeutic methods which can be grouped into two options: the medical option and the surgical option [11] [12], whereby, each option has several unique approaches. Over the past decades, surgical management, especially endoscopic, has continued to develop [13] [14] admitting effective surgical techniques which facilitate patient's short hospital stay and enhance rapid healing. It is important to note that the surgical treatment has well codified indications; surgical treatments are warranted when symptoms have not responded to conservative management, drug therapy, or when complications of BPH are diagnosed. The concerned complications are: obstructive renal insufficiency, recurrent acute retention despite medical treatment, acute retention of urine with failure of weaning of bladder drainage, recurrent macroscopic hematuria, recurrent urinary tract infections, bladder lithiasis or urinary incontinence by overflow.

However, in recent years many studies have reported complications related to surgical treatment, including urinary incontinence (UI) [15] [16]; several data reported that temporary UI occurs in more than 20% of patients after prostatic enucleation [17] [18]. UI is defined by the International Continence Society as a complaint of involuntary loss of urine [19]. Clinically, there are three main types of urinary incontinence: stress urinary incontinence (SUI), urinary incontinence due to urgency and mixed urinary incontinence [19].

UI is a common post-operative complication of prostate enucleation [17] [18], source of disappointment and psychological pressure for the attending physician and the concerned patient. However, publications revealed some predisposing factors in patients to urinary incontinence after enucleation for BPH including: advanced age, commorbidities (such as diabetes), a large size of the prostate gland, a long operating time, as well as significant blood loss during the operation. Several measures to prevent urinary incontinence after prostate enucleation have been reported: retaining the bladder neck, avoiding partial or complete

damage to the external sphincter, avoiding radial strain of the sphincter, cutting the urethral mucosa at 12 points with sharp energy, and precise low-energy hemostasis. Although there are methods of preventing and treating urinary incontinence after prostatic enucleation for BPH, the prevalence of post-surgical urinary incontinence remains high.

Anatomical and physiological study of the urethral sphincter reveals that the smooth muscle tissue located under the mucous membrane and near the external sphincter participates in urine control. We assume that the mucosa near the external sphincter has the effect of filling the gap left by the contraction of the sphincter. Based on the above two considerations, we believe that the mucosa near the external urethral sphincter plays an important role in urinary control; thus, we assume that prostatic enucleation for BPH, partially sparing the mucosa and the external urethral sphincter could decrease the incidence of post-surgical UI. The reduction of urinary incontinence after surgery for BPH would undoubtedly be a source of satisfaction for the surgeon, the patient and an economic gain for society with regard to the diagnosis and management of this urinary incontinence.

2. Anatomy of the Vesico-Sphincteric System in Men

The bladder: The bladder is a hollow muscular organ whose function is to collect urine produced by the kidneys and stored at low pressure between urination. It is a stretchy and elastic organ.

External configuration: in adults, when it is empty, it is flattened and located entirely in the pelvic cavity applied to the posterior surface of the pubic symphysis and to the antero superior part of the pelvic floor [20] [21]. When it is distended, it is ovoid in shape and protudes in the abdomen. In men, it is in front of the seminal vesicles and rectum, and above the prostate (**Figure 1**).

Capacity: in adults, the maximum anatomical capicity is 2 to 3 liters. The physiological capacity is approximately 150 ml for the first need to urinate and 300 ml for the normal need.

Means of fixity and bladder compartment: the bladder is well maintained, with the exception of its upper surface by:

- Bladder fascia: it covers the infero-lateral surfaces and the fundus of the bladder;
- Umbilico-vesical ligament;
- Other ligaments: the median umbilical ligament, pubo-prostatic ligament in men, the lateral bladder ligaments, the sacrogenital ligaments;
- The pelvic diaphragm and perineum: they are the most important means of fixity; in men, the puboperinealis muscle and the perineum effectively support the prostate, which support the bladder.

Internal structure of the bladder: The bladder contains 3 orifices: 2 ureteral orifices approximately 2 cm apart from each other, and connected by the interureteric fold; 1 urethral orifice, forming with the 2 ureteral orifices, the bladder trigone. The wall of the bladder presents the same histological organization of that of the terminal third of the ureter, namely 3 tunics: a mucosa, a smooth muscle, an adventitious or serosa (**Figure 2**).



Ramesh, B. and Jnaneshwari, T.L. (2016) Textbook and Atlas of Laparoscopic Hysterectomy. 1/e, 27, 6.

Figure 1. External configuration of the bladder.



Jones, O. (2020) Teach me anatomy. The Urinary Bladder. Figure 2. Internal configuration of the bladder.

- The serosa: covers only the upper surface and partially the posterior and lateral surfaces;
- The muscularis or detrusor: formed of 3 concentric smooth muscle layers; a surface layer of longitudinal layers, a deep plexiform layer and the middle layer, the most important because it constitutes muscle thickening in the neck, the smooth sphincter of the bladder neck. This muscular structure is part of vesical sphincter that assures continous urinary continence, bladder neck closure during ejaculation and allow to avoid retrograde ejaculation;
- The mucous membrane: urothelium.

Male urethra: The urethra is a multi-layered fibro-muscular duct which allows urine to be excreted from the body. It starts from the bladder neck, descends through the prostate and the pelvic floor to enter the bulb of the penis. In men, the urethra is about 20 cm long and is divided into four parts: the prostatic urethra measuring approximately 4 cm, the membranous urethra measuring approximately 3 cm, the perineal urethra which follows the membranous urethra, the penile urethra which measures approximately 15 cm (**Figure 3**).

The urethral sphincter is found distal to the prostate tip. It is in close relationship with but independent of the pelvic floor musculature. The urethral sphincter consists of two muscle types [22] [23]:

- the outer striated muscle fibres extending to the apex and the anterior surface of the prostate;
- an inner muscle layer consists of smooth muscle fibres and elastic tissue. The smooth muscle layer has its proximal limits at the level of the verumontanum [24].



Furr, J., *et al.* (2020) Functional Anatomy of the Male Urethra for the Reconstructive Surgeon. Springer, Cham, 17-24.

Figure 3. Sagital view of the male urethra.

The sphincter system: There are two well identified urinary sphincter systems: a proximal internal urethral sphincter assimilited to the vesical sphincter and the distal urethral sphincter assimilated to the external urethral sphincter [25].

The internal sphincter is made up of two layers: a longitudinal layer which intervenes during urination by opening cervix and shortening the urethra. It starts at the bladder neck and prolongs the smooth muscle of the trigone to join the verumontanum; a thicker circular layer at the level of the bladder neck in men, to form the preprostatic sphincter. Classically, these fibers behave like an authentic sphincter, that is to say an independent structure having its own innervation, capable of contracting and relaxing to ensure closure or opening of the cervix and the urethra [26].

The external sphincter consists of two parts: peri-urethral sphincter which is a part of the pelvic floor and is separated from the wall of the urethra by a plane of connective tissue: this is called the "external sphincter" classically described in books, located below the tip of the prostate; the para-urethral sphincter made up of the entire striated musculature from the bladder neck to the middle fascia of the perineum and is intimately associated with the urethral musculature and forms a sleeve externally lining the smooth sphincter [27].

Vasculature of the vesico-sphincteric system: The vesical vasculature is provided by branches of the internal iliac artery (**Figure 4**):

- A latero-superior sphincter pedicle to the lateral part of the bladder;
- A posterior pedicle formed by vesical branches of the inferior bladder artery;
- An antero-inferior pedicle deriving from a branch of the internal pudental artery.

The spongy urethra is supplied by the dorsal arteries of the penis, collateral to the internal pudental artery.

The vasculature of the striated sphincter is also provided by the pudental arteries.



Jones, O. (2020) Teach me anatomy. The Urinary Bladder.

Figure 4. Arterial supply to bladder.

The global venous return takes place in the venous plexus of santorini, and from there, in the internal pudental veins [28] [29].

Lymphatic drainage passes through the para-vesical nodes, then the internal iliac nodes and those of the promontory.

Innervation of the vesico-sphincteric system: The innervation of the vesico-sphincteric system is complex [30].

The coexistence within the lower urinary tract of a smooth musculature and a striated musculature requires a double innervation: vegetative and somatic.

• Vegetative innervation includes: hypogastric nerves, sympathetic fibers, pre and post-ganglion sympathetic neurons; parasympathetic afferents are formed by the pelvic nerves.

Somatic innervation is ensured by the branches of the pudental plexus, formed by the union of S2, S3 and S4, giving the nerves of the elevator of the anus (S3 and S4), the nerves of the sacrococcygeal muscle (S4) and the pudental nerve. Their medullary centers are located in the ventral horn of the 2nd, 3rd and 4th sacral segments.

3. Physiology of Continence and Male Micturition

The bladder must be able both to hold urine without weakness and to expel urine effortlessly.

The vesico-sphincteric function is subjected to a neurological control developed at 2 levels: automatic control, reflex, which regulates the alternation of filling and urination; brain control, voluntary, which makes it possible to order or refuse voiding reflex [31].

The filling phase: When filling, the bladder spreads out loosely in the small pelvis, its base becoming horizontal, and its neck remaining closed even during heavy coughing efforts. Continence is ensured by a simple gradient largely positive urethrovesical pressure.

Holding forces consist of 2 components:

- Urethral pressure: the maximum value is around 60 to 80 cm of water, increases during bladder filling, and collapses during urination [32];
- Urethral resistance, which is greater in men than women which is explained by the greater urethral length on the one hand, and by the presence of denser peri-urethral tissues such as the prostate on the second hand.

The filling phase is under the control of the sympathetic system, resulting in the relaxation of the detrusor (alpha receptors) and especially tonic contraction of the smooth muscle fibers of the cervix and urethra (beta receptors).

Urinary continence at rest: The bladder pressure for filling remains low, not exceeding 15 cm of water for a volume of 300 ml. This ability to store a large volume at low pressure is called 'compliance', thus helping to protect the upper urinary tract, and is explained by the elastic properties of the bladder [32].

Stress urinary continence: Some efforts, such as coughing, laughing, walking, or switching to orthostatism, raise the abdominal and intravesical pressure

up to 100 cm of water and more, which may overwhelm the restraining forces described above. However, there is a synchronous increase in urethral pressure to ensure continence. This phenomenon is explained by a somatic reflex called continence ("guarding reflex") resulting in the contraction of the perineo-sphincteric musculature [32].

The voiding phase: During urination, the bladder contracts concentrically. Its base turns into a funnel and its cervix opens with the urethra, allowing urine to pass. Bladder pressure rises between 30 and 60 cm of water, when urethral pressure collapses [32].

The voiding reflex: It corresponds to the intervention of the parasympathetic system, with 2 main effects:

- Powerfull and organized contraction, qualified as 'phasic', of all the detrusor smooth muscle cells;
- Collapse of the sphincter tone by reflex inhibition of the antagonistic system, sympathetic and somatic. This reflex coordination of the parasympathetic activation, coupled with the inhibition of the sympathetic and the somatic is organized at 2 levels: at the medullary centers and in the peripheral ganglion plexuses for sympathetic/parasympathetic coordination, at the brainstem centers for parasympathetic/somatic coordination.

Brain control of the voiding reflex: The need to urinate arises from stimulation of the detrusor tension receptors, carrying informations to the parietal cortex via the extralemniscal route.

Brain control is used to trigger or inhibit the voiding reflex organized in the centers of braintem, thanks to the connexion linking them to the cortical and subcortical centers. This is how reflex urination can be triggered [31].

These anatomical and physiological studies of the vesico-sphincteric system suggest that prostatic enucleation for BPH, partially sparing the urethral mucosa at the level of external sphincter, could reduce the incidence of UI occuring after surgery.

4. The Different Types of UI

There are five types of UI: stress UI (SUI), UI due to urgency, mixed UI (MUI), overflow and functional urinary incontinence [33].

In our review, we will talk about the three main types of UI: SUI, UI due to urgency and MUI.

SUI: Efforts such as coughing, giggling, walking can increase intra-abdominal pressure and lead to urinary incontinence. This form of incontinence is characterized by weakness of the muscles of the perineum and the urinary sphincter [34].

UI due to urgency: It is characterized by an involuntary leakage of urine through the urethral canal, accompanied or immediately preceded by an urgent and irrepressible need to urinate, resulting in urination which cannot be postponed and retained. This type of incontinence fits into the "overactive bladder syndrome" which is characterized by the onset of a sudden and difficult urge to

urinate, even impossible to control, defined by the term "urgency" [34]. **MUI:** It associates SUI with urinary urge incontinence.

5. Pathophysiology

The onset of LUTS after BPH enucleation is heterogeneous and has multiple origins, and may be the result of hypoxic rearrangement, neuromuscular changes, from chronic outlet obstruction. The distension of the bladder from bladder outlet obstruction (BOO) may cause muscle and epithelial modifications of gene expression and protein synthesis; this process alters the physiology and cellular structure of cell. The result is smooth muscle hyperplasia and bladder wall thickening with poor contractility, small capacity, and low compliance. Also, we think that BOO increases nerve growth factor, driving a neurotrophic effect on bladder neurons to help overcome outlet resistance during micturition. However, these hyperactive neuronal pathways may persist and be the source of irritative storage symptoms and detrusor overactivity. Also, vascular compression from chronic bladder distension may reduce perfusion to the bladder wall and cause neuronal death and severe denervation. This situation could lead to detrusor underactivity [35].

If they are entirely caused by the BOO, OAB symptoms should disappear following relief of obstruction; if, however, they are not, then they may persist following surgery. Thus, correct pre-operative characterization of LUTS is important before offering prostate enucleation for BPH [12].

This is how many studies have demonstrated the importance of UDS assessments in patients before surgery for BPH, or with persistent LUTS following BOO surgery [36] [37].

6. Diagnosis

Clinical diagnosis:

- Anamnesis: it focuses on the age of the patient, the medical and surgical history. A voiding calendar: the frequency (with schedule) and the volume of urination as well as the volume of drinks are carefully recorded in parallel with the frequency and importance of incontinence episodes as well as the quantity of pads used give both patient and physician a clear and objective table of incontinence.
- Voiding calendar: also useful to monitor the effect of the treatment instituted. It must be established over at least three consecutive days.
- Symptoms (Table 1) and quality of life scores (Table 2): they make it possible to assess the severity of incontinence, as well as its impact on the patient's daily life. Subsequently, will be used to evaluate the effectiveness of the choosen treatment.
- Physical examination: it includes an abdominal and rectal status as well as a summary neurological status; the examination of the external genitalia is of course essential.

Table 1. International Prostatic Symptoms Score (IPSS).

Over the past month	Not at all	Less than one time in five	Less than half the time	About half the time	More than half the time	Almost always
Incomplete emptying; How often have you had the sensation of not emptying your bladder completely after you finished urinating?	0	1	2	3	4	5
Frequency; How often have you had to urinate again less than two hours after you finished urinating?	0	1	2	3	4	5
Intermittency; How often How often you have found you stopped and started again several times when you urinate?	0	1	2	3	4	5
Urgency; How often have you found it difficult to postpone urination?	0	1	2	3	4	5
Weak stream; How often have had to push or strain to begin urination?	0	1	2	3	4	5
Sleeping; How many times did you most typically get up to urinate from the time you went to bed a t night until the time you got up in the morning?	0	1	2	3	4	5
from the time you went to bed a t night until the time you got up in the morning?	0	1	2	3	4	5

Symptoms scores

Total International Prostate Symptoms Score: 1 - 7 mild symptoms; 8 - 19 moderate symptoms; 20 - 35 severe symptoms.

Table 2. Quality of life index.

Quality of life (Qol)	Delighted	Pleased	Mostly satisfied	Mixed	Mostly dissatisfied	Unhappy	Terrible
If you were to spend the rest of your life with your urinary						_	_
condition just the way it is now, how would you feel about that?	0	1	2	3	4	5	6

Paraclinical diagnosis:

- Biology: uroanalysis gives informations of possible micro-haematuria, glucosuria or leukocyturia, bacterial culture, PSA dosage.
- Imaging: by transabdominal ultrasound, the post-voiding residue can be assessed; CT and MRI are special in this indication.
- Endoscopy: performing a urethrocystoscopy is necessary to verify the absence of urethral stenosis, urethral bridle, or bladder abnormality that may explain the lack of bladder compliance. Finally, urethrocystoscopy allow us to assess urethral fibrosis, a bladder neck sclerosis and urethral tenderness.
- Urodynamic diagnosis: it must be performed before any surgical treatment in order to specify the mechanism of urinary incontinence; it includes at least a flowmetry with measurement of the post-voiding residue, urethral profilometry with measurement of the maximum closing pressure of the urethra, cystomanometry with measurements of the bladder capacity and sensitivity and a measurement of the "leak point pressure" (intravesical or abdominal pressure associated with a urine leak) assessing the functional value of the

sphincter system.

Etiologies

There are multiple etiologies of UI after surgery for BPH, including: urethral sphincter insufficiency (USI) and/or bladder dysfunction (BD). BD can be a decreased compliance (DC) or detrusor overactivity (DO) [38] [39]. Some data have reported that more than 60% of UI were due to BD, probably as a result of a chronic obstruction caused by BPH [40].

Older patients have greater rates of BD and patients older than 70 years of age may be considered a high risk group [38] [39].

7. Management

Conservative management

- Behavioral, lifestyle modification (weight loss if necessary, decrease in consumption of caffeine and tobacco, regular physical activity, changes in fluid intake) or reevaluation can be used as the first line of treatment.
- Re-education: there are many physiotherapy techniques (pelvic floor muscle training, electrostimulation) and it is recommended to combine several in order to obtain maximum efficiency.
- Drugs: the choice of the drug introduced must be adapted to the physiopathological mechanism involved in the patient's UI. In case of stress incontinence, we can use duloxetine; in case of overactive bladder, we can use oxybutinin, trospium hydrochlorid, flavoxate, tolterodine and solifenacin.

If obstruction is suspected, it would be prudent to determine whether urethral or meatal stricture or bladder neck contracture, as these parts may require endoscopic resection or incision, dilation or complex re-construction.

Surgical management

- Peri or intra-urethral injections: the goal of intra injections of fillers is to create resistance to the flow of urine by increasing urethral coaptation. Several products were used: bovine collagen, silicone, carbon ziconium, hyaluronic acid, autologous fat, macroplastic, polydimethylsiloxane and non-silicone polyvinylpyrrolidone [41].
- Peri-urethral balloons: this is a system of two silicone balloons implanted on either side of the urethra by the perineal route, connected by a tube to an injection port or chamber allowing to fill or empty the balloon. They aim to compress the urethra in the region of the deficient striated external sphincter.
- The artificial sphincter: this is the standard treatment for UI for sphincter insufficiency. Its implantation technique has been standardized but remains complex and not without risk [41].
- External urinary diversion.

Sub-urethral strips: Sub-urethral strips appear as protheses at lower risk than artificial sphincter and at lower cost. The principle is to increase, by compression and therefore decrease in the diameter of the residual urethra, the number of sphincter cells available to ensure continence [42].

Neuromodulation: Sacral neuromodulation (SNM) involves the placement of an electrode into the third sacral (S3) foramen which is connected to a generator and battery, electrically stimulating the nerve root and suppressing the reflexes responsible for involuntary detrusor contractions. Currently, it is recommended in those who have failed or cannot tolerate conservative and medical treatment [42].

8. Discussion

Studies agree that the diagnosis of UI occurring after enucleation of the prostate for BPH is simple [9] [10]. Publications on the factors predisposing to the occurrence of UI after surgery seem to draw similar conclusions: advanced age, commorbidities such as diabetes, a large size of the prostate gland, a long operating time, as well as significant blood loss during the operation [15] [16] [36] [38].

The etiologies are multiples and similar in many publications [28] [39] [40]. However, these etiologies are dominated by BD [40], probably as a result of a chronic obstruction caused by BPH. Several means of prevention have been published: retaining the bladder neck, avoiding partial or complete damage to the external sphincter, cutting the urethral mucosa at 12 points with sharp energy, and precise low-energy hemostasis. Despite all these measures, the prevalence of UI occurring after prostate surgery for BPH remains high.

The study of the vesico-sphinteric system [20] [21] [22] [31] [32] [33], notably of the external urethral sphincter reveals that the mucosa near the external sphincter has the effect of filling the gap left by the contraction of the sphincter. Based on the above two considerations, we believe that the mucosa near the external urethral sphincter plays an important role in urinary control; thus, we assume that prostatic enucleation for BPH, partially sparing the mucosa and the external urethral sphincter could decrease the incidence of post-surgical urinary incontinence. This new surgical approach could help to reduce the incidence of UI occurring after prostate surgery.

This new approach is the subject of much scientific interests in many hospital centers in China, notably at the First Affiliated Hospital of Gannan Medical University where the prostate enucleation technique is well mastered. The technique of prostate enucleation is not yet widespread in many countries of sub-saharan Africa and should be the subject of interests over the next decade.

9. Conclusion

Urinary incontinence is a common post-operative complication of prostate enucleation; its diagnosis is simple. Risk factors are known: advanced age, commorbidities such as diabetes, a large size of the prostate gland, a long operating time, as well as significant blood loss during the operation. Despite the publication of many methods to avoid the occurrence of UI after prostatic enucleation, the prevalence remains high. After a study of the vesico-sphincteric system, we assume that prostatic enucleation for BPH, partially sparing the mucosa and the external urethral sphincter could decrease the incidence of post-surgical urinary incontinence. This hypothesis could be the subject of many studies.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Oelke, M., Höfner, K., Udo, J., Karl-Ulrich, L. and Ulf, T. (2007) Benign Prostatic Hyperplasia: Terminology and Assessment. *Deutsches Arzteblatt*, 104, 2261-2267. https://www.aerzteblatt.de/int/article.asp?id=56652
- [2] Ashfaq U.H. and Rasool Z. (2013) A Histological Study of Prostate. *International Journal of Research in Medical Sciences*, 1, 557-562. https://doi.org/10.5455/2320-6012.ijrms20131144
- [3] Lokeshwar, S.D., Harper, B.T., Webb, E., Jordan, A., Dykes, T.A., Neal Jr., D.E., *et al.* (2019) Epidemiology and Treatment Modalities for the Management of Benign Prostatic Hyperplasia. *Translational Andrology and Urology*, **8**, 529-539. https://doi.org/10.21037/tau.2019.10.01
- [4] Lim, K.B. (2017) Epidemiology of Clinical Benign Prostatic Hyperplasia. Asian Journal of Urology, 4, 148-151. <u>https://doi.org/10.1016/j.ajur.2017.06.004</u>
- [5] Berry, S.J., Coffey, D.S., Walsh, P.C. and Ewing, L.L. (1984) The Development of Human Benign Prostatic Hyperplasia with Age. *Journal of Urology*, 132, 474-479. <u>https://doi.org/10.1016/S0022-5347(17)49698-4</u>
- [6] Platz, E.A., Kawach, I., Rimm, E.B., Willett, W.C. and Giovannucci, E. (2000) Race, Ethnicity and Benign Prostate Hyperplasia in the Health Professional Follow-up Study. *Journal of Urology*, 163, 490-495. <u>https://doi.org/10.1016/S0022-5347(05)67909-8</u>
- [7] Parsons, J.K. (2007) Modifiable Risk Factors for Benign Prostatic Hyperplasia and Lower Urinary Tract Symptoms: New Approaches to Old Problems. *Journal of Urology*, **178**, 395-401. <u>https://doi.org/10.1016/j.juro.2007.03.103</u>
- [8] Kristal, A.R, Arnold, K.B., Schenk, J.M., Neuhouser, M.L., Goodman, P., Penson, D.F., et al. (2008) Dietary Patterns, Supplement Use, and the Risk of Symptomatic Benign Prostatic Hyperplasia: Results from the Prostate Cancer Prevention Trial. American Journal of Epidemiology, 167, 925-934. https://doi.org/10.1093/aje/kwm389
- [9] Vasanwala, F., Wong, M.C., Ho, H.S. and Foo, K.T. (2017) Benign Prostatic Hyperplasia and Male Lower Urinary Symptoms: A Guide for Family Physicians. *Asian Journal of Urology*, 4, 181-184. <u>https://doi.org/10.1016/j.ajur.2017.05.003</u>
- [10] Zhang, W., Zhang, H., Li, H., Wu, F., Wang, H., Zhao, M., *et al.* (2019) Prevalence of Lower Urinary Tract Symptoms Suggestive of Benign Prostatic Hyperplasia (LUTS/BPH) in China: Results from the China Health and Retirement Longitudinal Study. *BMJ Open*, 9, e022792. <u>https://doi.org/10.1136/bmjopen-2018-022792</u>
- [11] Gravas, S., Cornu, J.N., Gacci, M., Gratzke, C., Herrmann, T.R.W., Mamoulakis, C., et al. (2020) EAU Guidelines on Management of Non-Neurogenic Male Lower Urinary Tract Symptoms (LUTS), incl. Benign Prostatic Obstruction (BPO). European Association of Urology, 94, 15-46. http://uroweb.org/guidelines/compilations-of-all-guidelines

- [12] Macey, M.R. and Raynor, M.C. (2016) Medical and Surgical Treatment Modalities for Lower Urinary Tract Symptoms in the Male Patient Secondary to Benign Prostatic Hyperplasia: A Review. *Seminar of Interventional Radiology*, **33**, 217-223. https://doi.org/10.1055/s-0036-1586142
- [13] Huang, S.W., Tsai, C.Y., Tseng, C.S., Shih, M.C., Yeh, Y.C., Chien, K.L., et al. (2019) Comparative Efficacy and Safety of New Surgical Treatments for Benign Prostatic Hyperplasia: Systematic Review and Network Meta-Analysis. British Medical Journal, 367, Article No. 15919. <u>https://doi.org/10.1136/bmj.15919</u>
- [14] Carmignani, L., Clementi, M.C., Signorini, C., Motta, G., Nazzani, S., Palmisano, F., et al. (2019) Safety and Feasibility of Thulium Laser Transurethral Resection of Prostate for the Treatment of Benign Prostatic Enlargement in Overweight Patients. Asian Journal of Urology, 6, 270-274. <u>https://doi.org/10.1016/j.ajur.2018.05.004</u>
- [15] Song, W., Wu, J., Gai, J., *et al.* (2018) Holmium Laser Enucleation of the Prostate Prevents Postoperative Stress Incontinence in Patients with Benign Prostate Hyperplasia. *International Journal of Clinical and Experimental Medicine*, **11**, 2572-2576.
- [16] Nam, J.K., Kim, H.W., Lee, D.H., Han, J.Y., Lee, J.Z. and Park, S.W. (2015) Risk Factors for Transient Urinary Incontinence after Holmium Laser Enucleation of the Prostate. *The World Journal of Men's Health*, **33**, 88-94. https://doi.org/10.5534/wjmh.2015.33.2.88
- [17] Anan, G., Kaih, Y., Iwamura, H., Ito, J., Kohada, Y., Mikami, J., *et al.* (2020) Preoperative Pelvic Floor Muscle Exercise for Early Continence after Holmium Laser Enucleation of the Prostate: A Randomized Controlled Study. *BMC Urology*, 20, Article No. 3. <u>https://doi.org/10.1186/s12894-019-0570-5</u>
- [18] Sapetti, J., Sakat, J., Saad, E., Zerbib, M., Belas, O., Doru-Pop, C., *et al.* (2019) Urinary Incontinence after HOLEP: Incidence, Evolution and Predictive Factors. *Progrès en Urology*, **29**, 101-107. <u>https://doi.org/10.1016/j.purol.2018.12.008</u>
- [19] International Continence Society (2019) The 2019 Compilation of the International Continence Society Standardisations Consensus Statements, Educational Modules, Terminology and Fundamental Documents, with the International Consultations on Incontinence Algorithms. International Continence Society, Bristol. *Neurourology and Urodynamics*, **29**, 4-20.
- [20] Partin, A.W., Peters, C.A., Dmochowsky, R.R., Kavoussi, L.R. and Wein, A.J. (2020) Campbell Walsh Wein Urology. 12th Edition, Elservier, Amsterdam.
- [21] Shermadou, E.S., Rahman, S. and Leslie, S.W. (2021) Anatomy, Abdomen and Pelvis, Bladder. [Updated 2021 July 31]. In: *StatPearls*, StatPearls Publishing, Treasure Island. <u>https://www.ncbi.nlm.nih.gov/books/NBK531465</u>
- [22] Strasser, H. and Bartsch, G. (2000) Anatomy and Innervation of the Rhabdosphincter of the Male Urethra. *Seminar in Urologic Oncology*, 18, 2-8.
- [23] Rocco, F., Carmignani, L., Acquati, P., Gadda, F., Dell'Orto, P., Rocco, B., *et al.* (2007) Early Continence Recovery after Open Radical Prostatectomy with Restoration of the Posterior Aspect of the Rhabdosphincter. *European Urology*, **52**, 376-383. https://doi.org/10.1016/j.eururo.2007.01.109
- [24] Ganzer, R., Blana, A., Gaumann, A., Stolzenburg, J.U., Rabenalt, R., Bach, T., *et al.* (2008) Topographical Anatomy of Periprostatic and Capsular Nerves: Quantification and Computerised Planimetry. *European Urology*, 54, 353-361. https://doi.org/10.1016/j.eururo.2008.04.018
- [25] Walz, J., Epstein, J.I., Ganz, R., Graefen, M., Guazzoni, G., Kaouk, J., et al. (2006) A Critical Analysis of the Current Knowledge of Surgical Anatomy of the Prostate Related to Optimisation of Cancer Control and Preservation of Continence and Erec-

tion in Candidates for Radical Prostatectomy: An Update. *European Urology*, **70**, 301-311. <u>https://doi.org/10.1016/j.eururo.2016.01.026</u>

- [26] McGuire, E.J., Woodside, J.R., Borden, T.A. and Weiss, R.M. (1981) Prognostic Value of Urodynamic Testing in Myelodysplastic Patients. *Journal of Urology*, **126**, 205-209. <u>https://doi.org/10.1016/S0022-5347(17)54449-3</u>
- [27] Dorschner, W., Biesold, M., Schmidt, F. and Stolzenburg, J.U. (2009) The Dispute about the External Sphincter and the Urogenital Diaphragm. *Journal of Urology*, 162, 1942-1945. <u>https://doi.org/10.1016/S0022-5347(05)68074-3</u>
- [28] Sam, P., Nassereddin, A. and LaGrange, C.A. (2020) Anatomy, Abdomen and Pelvis, Bladder Detrusor Muscle. StatPearls, Treasure Island.
- [29] Matin, S.F. (2006) Recognition and Preservation of Accessory Pudendal Arteries during Laparoscopic Radical Prostatectomy. *Urology*, 67, 1012-1015. https://doi.org/10.1016/j.urology.2005.11.010
- [30] De Groat, W.C., Griffiths, D. and Yoshimura, N. (2015) Neural Control of the Lower Urinary Tract. *Comprehensive Physiology*, 5, 327-396. https://doi.org/10.1002/cphy.c130056
- [31] Cortes, G.A. and Flores, J.L. (2021) Physiology, Urination [Updated 2021 July 26]. In: *StatPearls*, StatPearls Publishing, Treasure Island. <u>https://www.ncbi.nlm.nih.gov/books/NBK562181/</u>.
- [32] Yao, M. and Simoes, A. (2021) Urodynamic Testing and Interpretation [Updated 2021 August 11]. In: *StatPearls*, StatPearls Publishing, Treasure Island. https://www.ncbi.nlm.nih.gov/books/NBK562310
- [33] Abrams, P., Cardozo, L., Fall M., Griffiths, D., Rosier, P., Ulmsten, U., et al. (2002) The Standardisation of Terminology of Lower Urinary Tract Function: Report from the Standardisation Sub-Committee of the International Continence Society. American Journal of Obstetrics and Gynecology, 187, 116-126. https://doi.org/10.1067/mob.2002.125704
- [34] Mangir, N. and Chapple, C. (2020) Management of Urinary Incontinence in Men. *Trends Urology & Men's Health*, 11, 18-22. <u>https://doi.org/10.1002/tre.740</u>
- [35] Singla, N. and Singla, A.K. (2016) Evaluation and Management of Lower Urinary Tract Symptoms after Outlet Surgery for Benign Prostatic Hyperplasia. *Current Bladder Dysfunction Report*, **11**, 242-247. https://doi.org/10.1007/s11884-016-0376-1
- [36] Han, H.H., Ko, W.J., Yoo, T.K., Oh, T.H., Kim, D.Y., Kwon, D.D., et al. (2014) Factors Associated with Continuing Medical Therapy after Transurethral Resection of Prostate. Urology, 84, 675-680. https://doi.org/10.1016/j.urology.2014.04.027
- [37] Seaman, E.K., Jacobs, B.Z., Blaivas J.G. and Kaplan, S.A. (1994) Persistence or Recurrence of Symptoms after Transurethral Resection of the Prostate: A Urodynamic Assessment. *Journal of Urology*, **152**, 935-937. https://doi.org/10.1016/S0022-5347(17)32614-9
- [38] Bruschini, H., Simonetti, R., Antunes, A.A. and Srougi, M. (2011) Urinary Incontinence Following Surgery for BPH: the Role of Aging on the Incidence of Bladder Dysfunction. *International Brazilian Journal of Urology*, **37**, 380-387. https://doi.org/10.1590/S1677-55382011000300012
- [39] Ficazzola, M.A. and Nitti, V.W. (1998) The Etiology of Post-Radical Prostatectomy Incontinence and Correlation of Symptoms with Urodynamic Findings. *Journal of Urology*, 160, 1317-1320. <u>https://doi.org/10.1016/S0022-5347(01)62525-4</u>
- [40] Goluboff, E.T., Chang, D.T., Olsson, C.A. and Kaplan, S.A. (1995) Urodynamics and the Etiology of Post-Prostatectomy Urinary Incontinence: The Initial Columbia

Experience. *Journal of Urology*, **153**, 1034-1037. https://doi.org/10.1016/S0022-5347(01)67629-8

- [41] Downey, A. and Inman, R.D. (2019) Recent Advances in Surgical Management of Urinary Incontinence. *F1000Research*, 8, Article No. 1294. https://doi.org/10.12688/f1000research.16356.1
- [42] Kretschmer, A., and Gratzke, C. (2018) Therapeutic Options for Stress Urinary Incontinence Following Surgery for Benign Prostate Enlargement. *Aktuelle Urologie*, 49, 334-338. <u>https://doi.org/10.1055/a-0642-1701</u>

Abbreviations

BD: bladder Dysfunction BOO: Bladder Outlet Obstruction BPH: Benign Prostatic Hyperplasia DC: Decrease Compliance DO: Detrusor Overactivity IPSS: International Prostate Score Symptoms LUTS: Lower Urinary Tract Symptoms MUI: Mixed Urinary Incontinence QoL: Quality of Life SUI: Stress Urinary Incontinence UI: Urinary Incontinence USI: Urethral Sphincter Insufficiency



Prostate Cancer in North of Benin: Epidemiological, Diagnostic Aspects and Difficulties of Management

Gandaho K. Isidore*, Tamou Sambo Bio, Toré Sanni Rafiou, Dandji Patrick, Soumanou Fouad, Allodé Alexandre

Surgery Department and Speciality Department, Medicine Faculty of University of Parakou, Parakou, Benin Email: *elvhick@gmail.com

How to cite this paper: Isidore, G.K., Bio, T.S., Rafiou, T.S., Patrick, D., Fouad, S. and Alexandre, A. (2022) Prostate Cancer in North of Benin: Epidemiological, Diagnostic Aspects and Difficulties of Management. *Open Journal of Urology*, **12**, 185-192. https://doi.org/10.4236/oju.2022.123018

Received: February 7, 2022 **Accepted:** March 12, 2022 **Published:** March 15, 2022

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Abstract

Background: In low incomes country, management and follow up of prostate cancer were hard due to difficult to earn drug and difficult access of new test imaging. We explore the epidemiological and diagnostic aspects of prostate cancer at regional university hospital of Parakou from 1st January 2017 to 1st January 2019. Objective: To study diagnostic and clinical aspects of prostate cancer at regional university hospital of Parakou. Methodology: This study was descriptive with prospective data collection (1st January 2017 to 1st January 2019). Patients who were admitted to the department were included. Demographic, clinical and anatomopathological variables were studied. Result: Eighty-one patients were included; the hospital prevalence is 1.6%. The mean year old of patients was sixty-nine years old ± 10 years old (farthest 45 years old and 95 years old). More than half patients were seventy years old. The medical past history of family cancer were found in 6.1% of cases. The complaints were voiding difficult in 54.3% of cases, urinary frequency in 46.9% of cases, complete urine retention in 28.4% of cases and bones pain in 14.8% of cases. The average time of consultation was 24.3 months (farthest 2 months and 48 months). The mean of prostate specific antigen (PSA) was 93.1 ng/ml (farthest 4 ng/ml and 1000 ng/ml). Adenocarcinoma was found in 84.1% of cases. Classic X-ray imaging was used in most cases to detect metastasis. Five patients had done thoracic-abdominal-pelvis tomography. Sixty-six patients (81.5% of cases) were prostate cancer metastasis. Conclusion: Prostate cancer was frequently disease in seventy years old patients. Diagnostic was late in this study. Awareness campaign of patients for early consult was recommended.

Keywords

Prostate Cancer, Late Diagnostic, Metastasis, PSA

1. Introduction

Prostate cancer is malign cancer. It is public health disease on the world. First cancer after fifty years old, prostate cancer is 4th row leading to death cancer on the world and 2nd row leading to death cancer in France after lung cancer [1] [2]. Prostate cancer can occur exceptionally before the fifty years old [3]. In Benin, prostate cancer was the first urology cancer; the prevalence of hospital was 12% [4].

Popularization of prostate specific antigen and digital rectal examination in the occidental countries involved early screen of disease and efficient management [5]. Nevertheless, in low incomes countries as Benin, the diagnostic was late; efficient management is difficult and only palliative management could be done.

This study was initiated to make point on specificities about prostate cancer in North of BENIN.

2. Methodology

This study was descriptive and prospective from 1st January 2017 to 1st January 2019. All patients who had prostate cancer were admitted at regional university hospital Borgou in Parakou. It was the unique hospital which had urology department in the north of BENIN.

We have included in this study: all patients who had prostate cancer and positive anatomopathological screen; all patient were suspected to digital rectal examination, prostate specific antigen ≥ 10 ng/ml and imaging test prove metastasis.

The patients who were secondary prostate cancer and they do not approved study were excluded.

We had studied these items: demographic profile (age, ethnic group, married or none, past medical history of patients, occupation), the complaints, physical feeling and imaging test.

The data was collected as soon as the patients were admitted using a pre-established survey form and filled in, depending on the results available.

We used software Epi info to collect data. The qualitative variables were expressed on proportion confidence interval (IC) 95% and the quantitative variables were expressed in mean with standard deviation. For the different association, significant level was 5%.

Indeed, we submitted our study project to the Local Ethics Committee for Biomedical Research of the University of Parakou (CLERBUP) which gave a favorable opinion. Anonymity was respected regarding the information obtained after informed approbation. Every patient was single examined.

3. Results

Eighty-one patients were admitted on thirty-one months. The 32.4 cases were admitted per year. The mean year old was 69 ± 10 years old (farthest 45 years old

and 95 years old). Eight patients on ten were more than sixty years old. One patient was less than fifty years old as shown in **Figure 1**.

Hypertension and diabetes were the most comorbidity in 33.3 percent and 12.3 percent every one; four patients (4.9%) had cerebrovascular accident.

The past medical history of family prostate cancer in first degree was found in five patients (6.1%). Moreover three patients were medical past history of breast cancer.

In consumer habit, we found milk in forty-four patients (54.3% of cases); we were found animal fat consumption in thirty-one patients (38.3 percent), alcohol in twenty-two patients (27.2%) and tobacco in six patients (7.4%).

All patients were coming to advanced stage of disease. Thirty-four patients (42% of cases) had used phytotherapy and twenty-two patients (27.2% of cases) done self-medical prescription. The average time of consultation was two months to forty-eight months. The mean was 24.3 months. Sixty-six patients (93.8% of cases) were complaints as shown in Table 1.

Fifteen patients (18.5% of cases) were normal digital restal examination. All patients had high level total prostate specific antigen (TPSA) (upper to 4 ng/ml). This value varied from 4 ng/ml to 1000 ng/ml. The mean was 93.1 ng/ml.

Three patients on quart were increased high level TPSA belong to 20 ng/ml. Among which twenty-three were TPSA belong to 100 ng/ml. We did biopsy in fifty-eight patients (80.7% of cases). The others patients (twenty-three) were more than seventy years old; TPSA was higher (upper to 100 ng/ml) and had had clinical complaints of prostate cancer.

Adenocarcinoma was found in 93.1 of cases. Epithelial intra neoplasia (PIN) high-rank was found in four patients (6.4% of cases). The mean of Gleaseon score was 6.95 (farthest 6 and 9). Prostate cancer was bad prognosis (Gleaseon score upper to 7) in 26.6% of cases.





We did thoracic-abdominal-pelvis tomography (TAP-tomography) coupler to bone scintigraphy in one patient and thoracic-abdominal-pelvis tomography in five patients. The others patients were done classic X-ray imaging and abdominal-pelvis ultrasound to detect metastasis of lung, pelvis bones, spinal column and liver as shown in **Table 2**.

	Frequency	Percentage (%)
Fortuitous discovery (number = 5)		
Prostatic adenomectomy piece	3	3.7
Awareness campaign	2	2.5
Urologic complaints		
Voiding difficult	44	54.3
Nycturia	38	46.9
Frequency urgency	32	39.5
Complete retention urine	24	29.6
Frequency voiding	20	24.7
Voiding pain	16	19.8
Hematuria	7	8.6
Non urologic complaints		
Bones pain	12	14.8
Neurological deficient	4	4.9
Chronic cough	2	2.5
Lower limb oedema	2	2.5
Pathological break	1	1.2

Table 1. Distribution of patients according to the complaints.

Table 2. Distribution of patients according to imaging test.

		Frequency	Percentage	disorders (%)
	pelvis	64	79	34 (53.1)
	Spinal cord	60	74.1	37 (61.7)
	Dorsal rachis	6	7.4	5 (83.3)
Classic X-ray imaging	Femur	2	2,5	1 (50.0)
	Humerus	1	1,2	1 (100.0)
	Grill costal	34	42	16 (47.1)
	Lung	64	79	29 (45.3)
TAP-Tomography		5	6.2	2 (40.0)
Tomography-TAP-Bones scintigraphy		1	1.2	0 (0)

4. Discussion

The frequency of new cases of prostate cancer per year was 32.4. Zango *et al.* [6] in Burkina-Faso had found thirteen new cases per year. The hospital prevalence was 5% and 16.3% in Guinee-Conakry [7] and Ivory Coast respectively. The incidence was underestimated because the patients who had clinical complaints and came to consultation included in these studies. They have excluded prostate cancer in early stage. The incidence was increased in developed country because of improvement of the diagnostic means and the management of this disease. Indeed Yaturu [8] in USA had found two and hundred-thirty-two thousand ninety new cases in two thousand five years. Rozet [9] *et al.* were found in France seventy thousand of new cases in two thousand fifteen years. Awareness campaign of patients and update of cancer register will help our government in management of cancer and specially on prostate cancer.

Prostate cancer was oldest man disease. The most cases were discovered after fifty years old. In this study, the patients aged sixty years old and more were 85.5%. The mean of year old was 69 years old \pm 10. In Togo [10], the mean year old was 68.5 years old. Abdessamad in Morroco [11] and Rigaud [12] were found seventy-two years old and seventy years old respectively. Prostate cancer was unusual in young people aged fifty years old. We were found two cases in this study. In Senegal, Alioune et al. [13] were found a mean year old of 44.3 in their study on early screen prostate cancer in forty years old men. Prostate cancer in young people was family cancer (inborn) or chromosome alteration [13]. Likelihood of prostate cancer depending of relationship on degree, number of relatives reached and age of the relative at the time of the cancer carrier diagnosis. The family form of prostate cancer in developed country was estimated 13% to 26% [14] [15]. Ndoye et al. [16] found it in both brothers who had first degree relationship. In this study, five patients (6.1%) had had genetic predisposition and cancer family in first degree relationship (father ascending) were found in four cases and the son one case.

Hypertension and diabetes were co-morbidity factors in 45.6% of cases. Hounnasso *et al.* [17] were found hypertension and diabetes in 33.3% and 6%. These comordbidity factors lead to difficult to management of prostate cancer. Because the patient was spent lot for their management and then due to progressive complication specific to diseases.

Prostate cancer was asymptomatic start disease. Cussenot [18] was told that the discovery of complaints revealed advanced cancer. In this study seventy-six patients (93.8%) were complaints. These results were the same that Niang *et al.* [19] study.

Complete urine retention was found in 28.4% in cases. In Senegal, Ndoye *et al.* [16] were found 23.53% in cases. Unlike the subsahara studies, in Morroco Abdessamad [11] was found it in 1.9% in cases. The higher rate of complete urine retention in subsahara studies can be explained by late of consultation due to lack of knowledge disease, asymptomatic start disease and lack of financial means.

In this study the most of patients (51.8%) were consulted one to six months. The time of consultation was increased and be equivalent to other studies [20].

These results were explained lack of knowledge disease, illeteracy, phytoterapy self-prescription. In most of cases (42%) were used phytoterapy before to consult.

The mean of PSA level was 93.1 ng/ml. This result depends on study type: weak for localized cancer, a higher for metastasis cancer. In the subsahara studies the rate was higher 212 ng/ml to 1754.7 ng/ml [16] [21]. These results had proved that the diagnostic of prostate cancer was done in advanced stage [22] [23]. In normogram, if PSA level was beyond 20 ng/ml the patient had bones metastasis risk and it was sure if PSA level > 100 ng/ml [24].

PSA level rate was correlated to cancer stage, regional lymph nodes or metastasis [25]. In this study fifty-six patients (77.8% of cases) were increased PSA level beyond 20 ng/ml and 26.4% of cases had PSA level beyond 100 ng/ml. As a result of normogram 77.8% of cases in this study were metastasis cancer or had risk to develop metastasis cancer.

The main type histologic of prostate cancer was adenocarcinoma [10] [20] [21].

Ndoye *et al.* [16] in Senegal were found adenocarcinoma in 97.7% of cases and sarcoma was second histologic type. In this study, adenocarcinoma was found in 84% of cases; the 16% remaining was undefined cancer which need to immuno-histochemical test.

Osteophilic of prostate cancer and osteoblast of bones metastasis to this cancer lead to detect easily metastasis on scintigraphy. This imaging was major to detect bones metastasis. But in low incomes countries it was not accessible. Only one patient was done in this study.

Tengue *et al.* [10] in Togo were realized scintigraphy in 7.8% of cases. Ndoye *et al.* [16] in Senegal did this imaging test in five patients on one-hundred-two patients (4.9% of cases). These rates prove that scintigraphy was not accessible in low incomes countries.

The classic X-ray imaging was the main test to detect metastasis in this study. The other studies were confirmed [10] [16]. However in Morocco study the scintigraphy was the main imaging Ref. [11]. In last time, classic X-ray imaging was the first line indication to detect bones metastasis in osteophilic cancers but now it has lost its in dication in the assessment of extension of these cancers Ref. [25]. Among the nineteen patients whose PSA level beyond 100 ng/ml, eight patients were realized classic X-ray imaging. Three patients on eight (37.5%) had had normal classic X-ray imaging lead to under staging of cancer.

5. Conclusion

Prostate cancer was serious oldest man cancer. It was under staging in low incomes countries because of lack knowledge of patient, inadequacy of the technical platform. Awareness campaign of patients for early consult was recommended.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Abrams, P., Cardozo, L., Fall, M., Griffiths, D., Rosier, P., Ulmsten, U., *et al.* (2002) The Standardisation of Terminology of Lower Urinary Tract Function: Report from the Standardisation Sub-Committee of the International Continence Society. *Neurourology and Urodynamics: Official Journal of the International Continence Society*, 21, 167-178. <u>https://doi.org/10.1002/nau.10052</u>
- [2] Siegel, R.L., Miller, K.D. and Jemal, A. (2015) Cancer Statistics, 2015. A Cancer Journal for Clinicians, 65, 5-29. https://doi.org/10.3322/caac.21254
- [3] Richard, F. (1994) Epidemiological of Prostate Cancer and Its Public Health Implications: Prostate Cancer. *La Revue du Praticien*, **44**, 575-579.
- [4] Ouattara, A., Hodonou, R., Avakoudjo, J., Cisse, D., Zango, B., Gandaho, I., et al. (2012) Epidemiological of Urologic Cancers at University Hospital Hubert Koutoukou Maga Cotonou, Republic of Benin. Hospital Series Analysis of One-Hundred-Fifty-Eight Cases. Progrès en Urologie, 22, 261-265. https://doi.org/10.1016/j.purol.2011.12.003
- [5] Villers, A. and Chautard, D. (2000) Free PSA: Frequently Use Is Premature for Prostate Cancer Screen. *Progrès en Urologie*, **10**, 618-621.
- [6] Zango, B., Ambou, T.K., Ompo, O.L., Sanon, A.J., Traore, A.C., Bonkoungou, B., et al. (2001) Management of Prostate Cancer at National Hospital of Bobo-Dioulasso Sanou Souro: About One-Hundred-Twenty-One Cases. Science et Technique, Sciences de la santé, 24, 79-87.
- [7] Diallo, A.B., Bah, I., Barry, A.M., Dombeu, N.Y., Barry, M. and Diallo, M.B. (2008) Epidemiological Profile of Prostate Cancer in Guinea. *African Journal of Urology*, 14, 161-167.
- [8] Yaturu, S., Djedjos, S., Alferos, G. and Deprisco, C. (2006) Bone Mineral Density Changes on Androgen Deprivation Therapy for Prostate Cancer and Response to Antiresorptive Therapy. *Prostate Cancer and Prostatic Diseases*, 9, 35. https://doi.org/10.1038/sj.pcan.4500846
- [9] Rozet, F., Bastide, C., Beuzeboc, P., Cormier, L., Fromont, G., Hennequin, C., *et al.* (2015) Management of Prostate Cancer of Low Risk. *Progrès en Urologie*, 25, 1-10. https://doi.org/10.1016/j.purol.2014.10.007
- [10] Tengue, K., Kpatcha, T.M., Botcho, G., Leloua, E., Amavi, A.K., Sikpa, K., et al. (2016) Epidemiological Profiles, Diagnostic, Management and Evolving Prostate Cancer in Togo. *African Journal of Urology*, 22, 76-82. https://doi.org/10.1016/j.afju.2015.06.006
- [11] Abdessamad, M.A. (2017) Clinic and Prognosis of Metastasis Prostate Cancer. Thèse Méd, Faculté de Médecine et de Pharmacie, Université Sidi Mohamed Ben Abdellah, N° 172.
- [12] Rigaud, J., Le Normand, L., Karam, G., Glemain, P., Buzelin, J.-M. and Bouchot, O. (2002) Prognosis Factors of Prostate Cancer Treated by First Line Homone Thera-

py. Progrès en Urologie, 12, 232-239.

- [13] Alioune, S., Yaya, S., Ibou, T., Boubacar, F., Babacar, D., Ahmed, F.P., *et al.* (2011) Early Detection of Prostate Cancer in Forty Years Old to Senegal. *Progrès en Urologie*, 21, 260-263. <u>https://doi.org/10.1016/j.purol.2010.05.011</u>
- [14] Carter, B.S., Bova, G.S., Beaty, T.H., Steinberg, G.D., Childs, B., Isaacs, W.B., *et al.* (1993) Hereditary Prostate Cancer: Epidemiologic and Clinical Features. *The Journal of Urology*, **150**, 797-802. <u>https://doi.org/10.1016/S0022-5347(17)35617-3</u>
- [15] Schaid, D.J. (2004) The Complex Genetic Epidemiology of Prostate Cancer. Human Molecular Genetics, 13, 103-121. <u>https://doi.org/10.1093/hmg/ddh072</u>
- [16] Ndoye, M., Niang, L., Gandaho, K.I., Jalloh, M., Labou, I. and Gueye, S. (2014) Evolving Prostate Cancer in Senegal. Diagnostic Aspect in Great Yoff Hospital. *Progrès en Urologie*, 24, 271-275. <u>https://doi.org/10.1016/j.purol.2013.08.317</u>
- [17] Hounnasso, P.P., Avakoudjo, D.J.G., Traore, M., Pare, A.K., Ouattara, A., Vodounou, A., *et al.* (2014) Anatomy Pathologic Outcomes of Prostate Biopsy: About 127 Cases. *Journal de la Société de Biologie Clinique du Bénin*, **21**, 93-96.
- [18] Cussenot, O., Rozet, F., Ruffion, A., Mottet, N., Bordier, B., Malavaud, B., et al. (2013) The Management of Prostate Cancer: A Retrospective Chart Review in 808 French Men Undergoing Biopsy. Progrès en Urologie, 23, 347-355. https://doi.org/10.1016/j.purol.2012.12.007
- [19] Niang, L., Ndoye, M., Ouattara, A., Jalloh, M., Labou, M., Thiam, I., *et al.* (2013) Prostate Cancer: What Management in Senegal? *Progrès en Urologie*, 23, 36-41. <u>https://doi.org/10.1016/j.purol.2012.09.002</u>
- [20] Fofana, A., Kouame, B., Gowe, E.E., Kramo, N.A.F., Konan, K.P.G., Moro, A.C., *et al.* (2017) Metastasis Prostate Cancer: Socio-Economic Aspect, X-Ray Imaging and Evolving in Ivory Cost. *African Journal of Urology*, 23, 281-285. https://doi.org/10.1016/j.afju.2016.11.002
- [21] Aouagbe, H.B., Hounnasso, P.P., Avakoudjo, J.D.G. and Ouake, A. (2015) Diagnostic Aspect of Prostate Cancer in Urology Department of CNHU HKM of Cotonou. *Revue Africaine d Urologie et d Andrologie*, 1, 10-16.
- [22] Coulange, C. (2006) Good Use of PSA (Antigen Specific of Prostate): Guidelines of Urology Association of French (AFU). *Memoires de l'Academie Nationale de Chirurgie*, 5, 19-21.
- [23] Lopez, J.-G. and Perrin, P. (1999) Prostate Cancer: Diagnostic, Evolving, Management of Principles. *La Revue du Praticien*, **49**, 297-301.
- [24] Salomon, L., Bastide, C., Beuzeboc, P., Cormier, L., Fromont, G., Hennequin, C., et al. (2013) Oncology-Urology Guidelines of CCAFU: Prostate Cancer. Progrès en Urologie, 23, S69-S101. <u>https://doi.org/10.1016/S1166-7087(13)70048-4</u>
- [25] Rozet, F., Hennequin, C., Beauval, J.-B., Beuzeboc, P., Cormier, L., Fromont-Hankard, G., *et al.* (2018) French Guidelines of AFU Oncology Committee-Update 2018-2020: Prostate Cancer. *Progrès en Urologie*, 28, S79-S130. https://doi.org/10.1016/j.purol.2018.08.011



Massive Vesical Hernias and Its Management: Case Series and Literature Review

Adolfo Castro-Rosas¹, Juan Carlos Angulo-Lozano^{1,2*}, Nezahualcoyotl Gonzaga-Carlos¹, Maria Fernanda Virgen-Rivera¹, Mariel Gonzalez-Calatayud¹, Jose Francisco Virgen-Gutiérrez¹, Jorge Jaspersen-Gastelum¹

¹Urology Department of Mexico General Hospital "Dr. Eduardo Liceaga", Mexico City, Mexico ²School of Medicine, Anahuac University, Mexico City, Mexico Email: *juanca_al55@hotmail.com, *juan.angulo@anahuac.mx

How to cite this paper: Castro-Rosas, A., Angulo-Lozano, J.C., Gonzaga-Carlos, N., Virgen-Rivera, M.F., Gonzalez-Calatayud, M., Virgen-Gutiérrez, J.F. and Jaspersen-Gastelum, J. (2022) Massive Vesical Hernias and Its Management: Case Series and Literature Review. *Open Journal of Urology*, **12**, 193-202.

https://doi.org/10.4236/oju.2022.123019

Received: January 27, 2022 **Accepted:** March 19, 2022 **Published:** March 22, 2022

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Abstract

Background: Bladder hernias are infrequent and should be treated by the urologist, or an experienced surgeon. An inguinoscrotal hernia of the bladder should be suspected in male patients with voiding symptoms and a fluctuant mass in the scrotum that changes its volume during urination. The most common characteristics found on the series were patients with advanced age, sedentary, and overweight. **Case Presentation:** We present a case series of 4 patients with inguinoscrotal herniation of the bladder, the surgical management, and outcome. **Conclusion:** The surgical technique used was inguinal plasty with Lichtenstein technique and either laparoscopic or open surgery mesh-plug placement. None had surgical complications, and none had recurrence at their follow-up.

Keywords

Inguinal Plasty, Bladder Herniation, Lichtenstein Technique, Functional Urology

1. Introduction

Inguinoscrotal herniation of the bladder is defined as the protrusion of the urinary bladder into the inguinal canal with extension to the scrotum [1]. Anatomic classification of bladder herniations includes paraperitoneal, intraperitoneal, and extraperitoneal [2]. Bladder herniation represents 0.5% - 5% of reported inguinal hernias and is considered a rare condition, and scrotal affection of the hernia represents a small fraction of bladder hernias [2]-[7]. Bladder hernias tend to occur in older individuals (63.5 years) and have longer symptomatic periods (5.3 years) [8]. It is usually diagnosed due to urinary symptoms or imaging, with most of these hernias asymptomatic [9] and the gold standard being cystography [10] [11]. Symptoms described in the literature range from double-phase urination (the patient passes more urine after initial voiding application pressure on the hernia) to nocturia, frequency, urgency, and hematuria. However, massive cystoceles are rare, and less than 35 cases have been published in the literature [2]-[7]. In this case series, we present four patients with inguinoscrotal herniation of the bladder with its surgical management, risk factors description, and clinical evolution. They all had a favorable outcome, and there were no complications or recurrence at their follow-up. The objective is to recognize the signs and symptoms that typically present in inguinoscrotal herniations of the bladder as it is uncommon and can have life-threatening complications.

2. Case Report

2.1. Case 1

A 69-year-old man with no family or personal, relevant history presents to the office with a one-year history of a growing mass in the right inguinoscrotal region, non-tender and auto-reducible. Pain presented three months ago elicited with abdominal effort. He refers that the mass volume diminishes during urination. There are no neurologic, pulmonary, or cardiac abnormalities on physical examination. The abdomen was soft and non-tender. On inguinoscrotal examination, the right scrotum has increased volume with dimensions of a palpable mass of 8×10 cm (Figure 1). It is reducible by pressure and protrudes with the Valsalva maneuver. Cystography reports a deforming bladder that slides into the inguinoscrotal region with a residual urine volume of 45 mL (Figure 2). Diagnosis



Figure 1. Genitals of the patient with a bulge on his right scrotum.



Figure 2. Cystography with a full bladder during Valsavla maneuver showing a sliding hernia to the groin.

of inguinoscrotal hernia of the bladder is made. Open surgical technique of right inguinal plasty is performed, with manual reduction of the bladder through the defect, without any signs of strangulation, the bladder is repositioned. Polypropylene mesh-plug placement is performed with the Lichtenstein technique for herniorrhaphy. He is discharged the day after surgery without any immediate complications.

2.2. Case 2

A 77-year-old male patient from Mexico City with a history of controlled systemic arterial hypertension and insulin-controlled type 2 diabetes mellitus presents to the office with symptoms that started three years ago. He refers to dysuria, tenesmus, and frequency and increased volume in the right scrotum, which has progressed with a moderately intense stabbing type of pain aggravated with cough and decreases after urination. Neurological examination is without alterations, and pulmonary examination is unremarkable. On physical examination, the abdomen is soft and non-tender. An increase in volume is observed in the right scrotal region with a 7×8 cm mobile mass, reducible and protruding to the Valsalva maneuver (**Figure 3**). A pelvic ultrasound is performed and reports a prostate of 58 cc, with intravesical protrusion of 17 mm and residual urine of 43%. Subsequently, a cystography is performed and reports a bladder deformation that slides through the inguinal canal into the scrotum, with a residual urine volume of 21 mL (**Figure 4**).

A massive right inguinoscrotal hernia of the bladder was diagnosed, and surgery was performed on November 24th, 2020. Inguinal plasty with mesh-plug and Lichtenstein repair technique is performed without further complications, and the patient was discharged 48 hours after surgery.



Figure 3. Expanded scrotum of the patient before urination.



Figure 4. Cystography of the patient with a significant portion of the bladder herniated before urination.

2.3. Case 3

A 44-year-old male patient from Mexico City with no significant family or personal history presents to the office. The patient began five months ago with increased volume in the right inguinal region that descends to the ipsilateral scrotal pouch with mild, intermittent, oppressive pain that decreases upon urination. The patient reports the need to urinate in a sitting position and press the scrotal region to finish urination. On physical examination, the patient is oriented without any neurological alterations, the pulmonary examination is normal with rhythmic cardiac sounds without murmurs or pathological sounds, the abdomen is depressible to palpation with no pain, and an increase in volume is observed in the right inguinoscrotal region with pain to reduction and protrusion to the Valsalva maneuver (Figure 5). Cystography reports that the right inferolateral portion of the bladder protrudes through the inguinal canal into the right scrotum (Figure 6). Massive inguinoscrotal herniation of the bladder is diagnosed. Surgery is performed. Right inguinal plasty is completed, the bladder is repositioned into the retropubic space, and two polypropylene meshes are placed with the Lichtenstein technique. The patient was discharged and had a follow-up of 3 months; he had no complications.

2.4. Case 4

83-year-old masculine is referred to the Urology department by his primary care physician because of a bulge in the left inguinal region; the patient has a history of 29 years smoking a with 4-pack-a-year rate, discontinued at age 45, hypertension



Figure 5. Genitals before surgery with a palpable mass in the right scrotum.



Figure 6. Right herniation of the bladder on cystography during the elimination phase.

diagnosed eight years ago in actual treatment and well-controlled and hypercholesterolemia in therapy with atorvastatin. He had a transurethral prostatectomy resection in 2004 and coronary catheterism due to an acute myocardial infarction in 2017. One year ago, the patient started with lower urinary symptoms (IPSS: 13). He was treated with tamsulosin daily. He noticed a progressively growing mass in the left inguinal region, which was diminished by urination. He denies hematuria, dysuria, or weight loss. He is orientated and cooperative on physical examination with no neurologic alterations, the cardiopulmonary examination is unremarkable, and the abdomen is soft and non-tender. A painless bulge on the left inguinal region is reducible and aggravated by the Valsalva maneuver. He is asymptomatic. Cystography reports herniation of the left lateral portion of the bladder into the inguinoscrotal region (Figure 7). CT scan was also performed because there were cystic findings during renal ultrasonography and reported herniation of the left anterolateral portion of the bladder into the ipsilateral inguinal canal (Figure 8). Laparoscopic surgery with tension-free mesh repair was performed. The next day he was discharged and had a 3-month follow-up without any immediate or late complications.

3. Discussion

Bladder herniation is a rare condition. Wakely *et al.* found an incidence of 75 in 5000 cases of inguinal hernias. The bladder is present in 14% of inguinal hernias in the general population and at least in 10% of cases of patients over 50 years [12] [13]. On the other hand, one of the first available descriptions of bladder



Figure 7. Cystography with a massive left sliding hernia of the bladder during the elimination phase.



Figure 8. CT scan of the patient shows herniation of the bladder anteriorly to the pelvic bone in the left scrotum.

hernias was made by Levin in 1951, where he reported 32 cases [14]. Such condition was found in patients over 50 years, and it was more frequent on the right side in 3 of our 4 cases, while bilateral herniation was exceptional. This condition usually presents asymptomatic and is found incidentally during surgery [12] [13]. All anatomic parts of the hernia can be herniated except the trigone [12].

Bladder hernia etiology is variable and has many risk factors. It has been determined that outflow obstruction of the urinary tract (prostatic hyperplasia, prostatitis, sclerosis of the bladder neck, or urethral stenosis) causes muscular tone impairment in the bladder, thus debilitating support structures. This is the most important common cause in elderly and obese patients [13] [14]. 3 (75%) cases were associated with lower urinary tract symptoms (LUTS) in our case series. Most bladder hernias are extraperitoneal, paraperitoneal, and less frequent are intraperitoneal subsequently [14]. In our case series, all were extraperitoneal bladder hernias. Clinical findings vary with a broad spectrum of symptoms from asymptomatic to incapacitating pain, and non-specific symptomatology like urinary frequency, dysuria, nocturia, and hematuria [14] [15]. There were 2 (50%) patients with lower urinary tract symptoms.

Clinical findings and imaging studies can diagnose; the gold standard has been retrograde cystography since Levine reported the first cases [12] [15]. Cystoscopy is fundamental to evaluate the urethra, prostate, the neck of the bladder, bladder mucosa, and ureteral orifices. Imaging studies diagnosed this case series of bladder herniations; 100% had retrograde cystography, and 25% had a CT scan.

Treatment should always be surgical repair and inversion back to the retropubic space in the abdomen [14]. Massive inguinoscrotal herniation has some surgical limitations and is more challenging to treat because of the pelvic muscle and abdominal muscle dysfunction that caused weakness. In some cases where there is urethra compromise, a surgical incision in the bladder can facilitate catheter placement to dissect the bladder and identify the urethra to place drainage for 7 to 14 days [14]. All the cases were uncomplicated hernias, and all of them were repaired by the Lichtenstein technique. Resection of the everted portion can be made depending on the size, location, and width of the neck of the bladder; advantages of reduction instead of resection include contamination, preservation of bladder capacity, and reduced urethral injury [14]. The absolute indication for resection of a massive inguinoscrotal hernia is the presence of a tumor in some portion of the hernia, inflammation, necrosis of the bladder, or diverticulum of the herniated part of the bladder. A relative indication of the incision is a narrow neck of the bladder, less than 0.5 cm in its maximum diameter [14] [15].

Possible complications related to bladder hernias are vesicoureteral reflux, bladder torsion, strangulation of the bladder, gangrene, empyema, lithiasis, infarction, perforation of the viscera, hydronephrosis, pyonephrosis, renal failure, and bladder carcinoma [13] [14]. There were no early or late complications in the cases reported in this study.

Risk factors for bladder herniation include men, obesity, age > 50, and previous inguinal herniation [13] [15]. 3 out of 4 were older than 50 years (75%) none were obese or had a history of inguinal herniation (0%). Half presented LUTS (50%). None had associated complications.

4. Conclusion

Herniation of the bladder is rare and is even rarer to have a sliding inguinoscrotal hernia; bladder hernias are commonly diagnosed at the time of an inguinal herniorrhaphy. Inguinoscrotal hernias are diagnosed clinically with the presence of a bulge in the scrotum that can be reduced and is diminished by urination. Cystography and CT scans are used as diagnostic tools to evaluate the extension and composition of the hernia. Herniorrhaphy with free tension-mesh placement by the Lichtenstein technique is still the gold standard treatment for this condition. It has a good outcome for the majority of the patients, as seen in this case series.

Funding Statement

No one funded this study. Information was collected by informed consent.

Acknowledgements

I want to thank Janeth Leon, who helped me translate this paper and corrected grammatical errors.

Ethical Considerations

This article complies with the requirements of the Declaration of Helsinki since care was taken to protect the health of the population in all aspects during the protocol.

No procedure was performed that should be considered harmful and unnecessary for the patient during the protocol; on the contrary, the improvement of her health status was always sought. The procedures were carried out to comply with the regulations of the General Health Law regarding health research, complying with the corresponding articles.

The patients signed an informed consent agreement to publish their cases anonymously.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Thompson Jr., J.E., Taylor, J.B., Nazarian, N. and Bennion, R.S. (1986) Massive Inguinal Scrotal Bladder Hernias: A Review of the Literature with 2 New Cases. *Journal of Urology*, **136**, 1299-1301. <u>https://doi.org/10.1016/S0022-5347(17)45321-3</u>

- Gomella, L.G. (1985) The Surgical Implications of Herniation of the Urinary Bladder. *Archives of Surgery*, **120**, 964-967. <u>https://doi.org/10.1001/archsurg.1985.01390320084018</u>
- [3] Laniewski, P.J., Watters, G.R. and Tomlinson, P. (1996) Herniation of the Bladder Trigone into an Inguinal Hernia Causing Acute Urinary Obstruction and Acute Renal Failure. *Journal of Urology*, **156**, 1438-1439. https://doi.org/10.1016/S0022-5347(01)65613-1
- [4] Karaman, Z.C., Saray, A., Dorak, C. and Tamac, N.I. (1993) Ultrasonographic Diagnosis of Massive Bladder Hernia. *Journal of Clinical Ultrasound*, 21, 534-536. https://doi.org/10.1002/jcu.1870210812
- [5] Vindlacheruvu, R.R., Zayyan, K., Burgess, N.A., Wharton, S.B. and Dunn, D.C. (1996) Extensive Bladder Infarction in a Strangulated Inguinal Hernia. *British Journal of Urology*, 77, 926-927. <u>https://doi.org/10.1046/j.1464-410X.1996.07035.x</u>
- [6] Casas, J.D., Mariscal, A. and Barluenga, E. (1998) Scrotal Cystocele: US and CT Wndings in Two Cases. *Computerized Medical Imaging and Graphics*, 22, 53-56. <u>https://doi.org/10.1016/S0895-6111(98)00007-X</u>
- [7] Papatheofani, V., Beaumont, K. and Nuessler, N.C. (2020) Inguinal Hernia with Complete Urinary Bladder Herniation: A Case Report and Review of the Literature. *Journal of Surgical Case Reports*, 2020, Article No. rjz321. https://doi.org/10.1093/jscr/rjz321
- [8] Komorowski, A., Moran-Rodriguez, J., Kazi, R. and Wysocki, W.M. (2012) Sliding Inguinalhernias. *International Journal of Surgery*, 10, 206-208. <u>https://doi.org/10.1016/j.ijsu.2012.03.002</u>
- [9] Frenkel, A., Roy-Shapira, A., Shelef, I., Shaked, G., Brotfain, E., Koyfman, L., et al. (2015) Inguinal Herniation of the Urinary Bladder Presenting as Recurrent Urinary Retention. *Case Reports in Surgery*, 2015, Article ID: 531021. https://doi.org/10.1155/2015/531021
- [10] Andaç, N., Baltacioğlu, F., Tüney, D., Çimşit, N.Ç., Ekinci, G. and Biren, T. (2002) Inguinoscrotal Bladder Herniation. *Clinical Imaging*, 26, 347-348. <u>https://doi.org/10.1016/S0899-7071(02)00447-3</u>
- Bisharat, M., O'Donnell, M.E., Thompson, T., MacKenzie, N., Kirkpatrick, D., Spence, R.A.J. and Lee, J. (2008) Complications of Inguinoscrotal Bladder Hernias: A Case Series. *Hernia*, 13, 81-84. <u>https://doi.org/10.1007/s10029-008-0389-6</u>
- [12] Soloway, H., Portney, F. and Kaplan, A. (1960) Hernia of the Bladder. *The Journal of Urology*, 84, 539-543. <u>https://doi.org/10.1016/S0022-5347(17)65588-5</u>
- [13] Catalino, O. (1997) US Evaluation of Inguinoscrotal Bladder Hernias: Report of Three Cases. *Clinical Imaging*, 21, 126-128. https://doi.org/10.1016/S0899-7071(96)00018-6
- [14] Zajaczkowski, T. (2007) Scrotal Blader Hernia: Report of Two Cases. International Urology and Nephrology, 39, 479-484. <u>https://doi.org/10.1007/s11255-006-9028-2</u>
- [15] Oruç, M.T., Akbulut, Z., Özozan, Ö. and Coşkun, F. (2004) Urological Findings in Inguinal Hernias: A Case Report and Review of the Literature. *Hernia*, 8, 76-79. https://doi.org/10.1007/s10029-003-0157-6



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ISSN 2160-5440 (Print) ISSN 2160-5629 (Online) https://www.scirp.org/journal/oju

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