A STUDY ON THE EFFECT OF TAMSULOSIN IN URETERIC STENT RELATED MORBIDITY

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CERTIFICATE

This is to certify that the dissertation titled **"A STUDY ON THE EFFECT OF TAMSULOSIN IN URETERIC STENT RELATED MORBIDITY"** is the bonafide original work of **Dr.D.KAMALESH KUMAR** in partial fulfillment of the requirements for **MCH UROLOGY BRANCH – IV** Examination of the Tamilnadu Dr. M.G.R. Medical University to be held in August 2014. The period of postgraduate study and training was from August 2011 to July 2014.

GUIDE :

PROF. P.GOVINDARAJAN,
M.S., MCH URO,
PROFESSOR
DEPARTMENT OF UROLOGY
GOVT. STANLEY MEDICAL
COLLEGE, CHENNAI-600 001.

PROF. V.SELVARAJ ,
M.S.,MCH URO,
PROFESSOR & HEAD
DEPARTMENT OF UROLOGY
GOVT. STANLEY MEDICAL
COLLEGE, CHENNAI-600 001.

Dr. AL.MEENAKSHI SUNDARAM, MD., DA,
DEAN,
STANLEY MEDICAL COLLEGE & HOSPITAL,
CHENNAI - 600001

DECLARATION

I, **Dr.D.KAMALESH KUMAR,** solemnly declare that the dissertation titled, "**A STUDY ON THE EFFECT OF TAMSULOSIN IN URETERIC STENT RELATED MORBIDITY**" is a bonafide work done by me at Govt. Stanley Medical College & Hospital during 2011-2014 under the guidance of **PROF. DR.P.GOVINDARAJ, M.S., MCH URO**, Professor, Department of Urology and supervision of **PROF.DR.V.SELVARAJ, M.S, M.CH URO,** Professor and Head, Department of Urology, Government Stanley Medical College, Chennai-600 001.

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Date:

(Dr. D.KAMALESH KUMAR)

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ABBREVIATIONS

BPH	-	Benign prostatic hyperplasia
IPSS	-	International Prostate symptoms score
LUTS	-	Lower urinary tract symptoms
SD	-	Standard deviation
AR	-	Adrenergic receptor

INTRODUCTION

Urolithiasis is a very common problem, and the challenges that it has posed has been instrumental in devising various means to tackle the stone burden. With the advent of technology every passing day has seen innovations that has lead to better stone clearance in every individual patient.

Since the time H Young[1] had attempted his first cystoscopy, efforts were always being made to access the urinary tract efficiently and with lesser morbidity as possible. The inventions like semirigid and flexible ureteroscopes all of which, were an extension of the technology available at the time like rod lens system and fibre-optics systems. [2, 3]

With better access, visualization and stone fragmenting techniques, endourological procedures have become a mainstay in treatment of stone diseases. As with advances in vogue at that time, ureteric stents have undergone dynamic evolution in a constant search for the ideal design and material and in a bid to surpass or in the least reduce the symptoms associated with it.

Despite the vast evidence supporting non stented ureteroscopies,[4] worldwide many urologists still prefer to place stents in

majority of uncomplicated stone removal procedures in a bid to improve drainage ,stone clearance and clear residual fragments and avoid ureteric stricture.

Ureteric stents are associated with a wide spectrum of symptoms thereby producing considerable morbidity ranging from 80 to 98% and the discomfort caused varies from patient to patient.[4,5]

The symptoms produced by the stent are predominantly irritative in nature and seems to produce significant bother so as to affect the quality of life of the patient, warranting removal in some cases.[5,6]

An important factor for the stent-related symptoms is the pressure transmitted to the renal pelvis during urination and trigonal irritation by the intravesicular part of the stent. Reflux of urine into the upper tract is inevitable with a patent stent in position and around 80% of patients were observed to have reflux during voiding stage and this produces flank pain.[5,6]

Alpha adrenergic receptor like α1A and α1D have been documented to be distributed the in the lower urinary tract and the distal ureter and the use of alpha adrenergic receptor blockers like Tamsulosin

have shown considerable promise in treating the stent related symptoms.[7,8,9]

Hence this study, was done in an effort to determine the effect of Tamsulosin in improving double-J stent related symptoms and quality of life following ureteral stent placement.[10]

AIM OF THE STUDY

1) To evaluate ureteric stent related morbidity.

2) To evaluate the effect of Tamsulosin in ureteral stent related morbidity.

REVIEW OF LITERATURE

Evolution and History of the Double-J stent:

Introduction

Dr. Gustavẽ Simon was the first person to describe inserting a tubular inert material into the ureter an earliest version of the ureteric stent in the 1800s. Later in the early 1900s Dr.Joaquin Albarrano made a catheter exclusively for this purpose, which was made of fabric and completely coated with lacquer varnish.[11]

In 1967, Dr.Paul Zimskind and his associates reported about the use of a straight tube which was open ended and made of silicone which was used to relieve ureteric obstruction , and referred to it as the “ureteral splint”. This was the first ever description of a stent being placed endoscopically unlike the open approach which was being practised earlier. This marked the modern era in the history of the ureteral stents. But there was one major problem faced with this stent is it prone to spontaneously slip out due to its straight nature.[12]

Various modification in the design of stent were tried to prevent its migration. Marmar in 1970 closed the proximal end to aid in its placement, thereby introducing it over a guide-wire by passing it through a cystoscope.[13]

Later in 1973, Orikasa developed the pusher which helped in placing the stent over a guide-wire. Once placed the main problem was in maintaining the stent position.[14]

Gibbons stent in 1974 was the earliest one to address this issue , by having numerous barb like like projections along the silicone shaft with a distal flange. Though it provided effective and adequate drainage the barbs increased the total diameter to around 11Fr, hence making placement difficult along narrow obstructed areas.[15]

Then in 1973 the term stent was added to the vocabulary of urologists , by Dr.James Montie ,referring to the indwelling tubes that were placed in the urinary tract.[11]

In 1974 McCullough introduced the “shepherds crook” stent that was designed to prevent the slipping out, a design that was extensively resourced in from stents that were used in vascular surgery at those times meant for stenting blood vessels. Though the curl in the upper part prevented the downward migration, still the upward migration was the problem to contend with.[16]

In 1978 Dr.Roy P.Finney was the person who described the existing double J stent which had curls at both ends in opposing

directions. These curls provided the necessary fixity to these stents which prevented migration in either direction.[17]

Modern stents have a full curl in place of just a “j” curl and are called “pigtails” but the term double-j is still used commonly.[18]

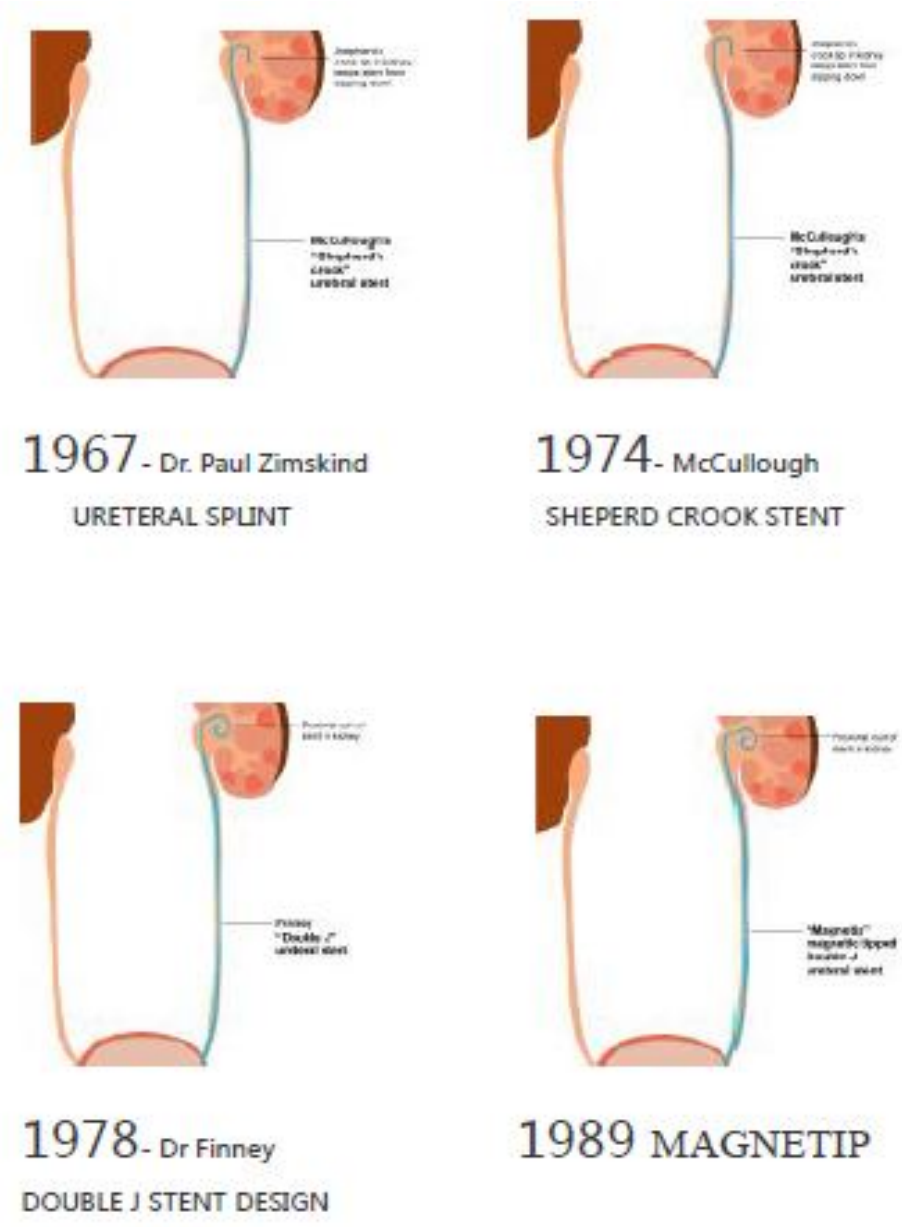
In 1989 ACMI launched the Magnetip double J stent which could be removed by a magnet, obviating the need for a cystoscopy. But it ceased to be used because the Magnetriever used to remove it was not always reliable and often needed cystoscopy for removing.[19]

Boston Scientific in 2000 based introduced the Percuflex tail stent with an aim to decrease the plastic content which was thought to have caused the patient discomfort. Though Dunn’s study concurred with this idea, Lingeman in 2009 found no difference of symptoms at the 4th post operative day.[20]

Again in 2001 Boston scientific made a stent which had a firmer upper end to facilitate introduction and a soft lower end so as to decrease symptom related to the stent but was proved by Davenport in 2011 as no better than the other earlier available stents.[21]

1n 2006 Cook devised the Resonance metallic stent made of metal in the form of a continuos coil, appearing like a tight spring. It

was designed stronger and to have curls at either ends so as to prevent kinking or collapse inwardly due to extrinsic pressure causing compression. It is most commonly used in conditions like cervical or colonic cancer which cause ureteric obstruction. [22]



EVOLUTION IN STENT DESIGNS

Earlier until 1978 stents were fashioned to be passable only endoscopically in a retrograde method, but not suitable for usage during open procedures.

An ideal stent which was of uniform diameter, passable through a cystoscope ,urethra and ureteric orifice in either direction, and did not migrate in both directions, producing less trauma to endothelial surfaces and radio-opaque to facilitate visualization during fluoroscopy was needed. Last and foremost is that it had to be made of a material that had minimal encrustation properties.[20]

The double J stent made of fine strand tubing of silicone which curled at either end to form J like hooks were devised. This solved the problem of migration and due to minimal contact with the luminal endothelial surfaces produced less discomfort . [23]

STENT CHARACTERISTICS :

Initially was available in diameter calibres of 7 and 8.5 Fr and various lengths like 16, 26 and 28cm. It was along the straight segment of a ureteral stent that the length was measured in between both the curls. Drainage holes are located at increments of 1cm ; at every 5cm increment standard markings are mentioned on the main shaft.[17]

Earlier ureteral catheters were made from various materials, but in 1839 vulcanization lead to the development of rubber based catheters which were firm , flexible and durable. In late 1800s, gum elastic catheters had been invented in France. By the beginning of 1930s, they were made of gum elastic which incorporated varnish coated woven nylon, and were in widespread use. Subsequently they were made of polyethylene or polyvinyl hence making them a more rigid , facilitating easy placement.[23,24]

Stents made of silicone elastomer, a substance having a consistency similar to that of latex rubber, had the added advantages like improved elasticity useful for easy placement, maintenance in the proper position, and increased resistance to encrustation due to urinary deposits. Silicone has become the standard against which other materials were measured for tissue compatibility, and was being preferred for urinary drainage tubes and other forms of self-retaining catheters.[23,24]

STATE OF THE ART :

Over the period of years various attempts that were made to improve on the design of the basic Double-J, till recent times have met with limited success. The basic design of the Double-J has been excellent in its efficacy. But the silicone rubber, though an excellent

material, needs much improvement. Silicone is soft and non-irritating, hence increases patient comfort, mainly for long-term usage. But because it has a higher coefficient of friction than the other available materials, there is increased difficulty during initial passage.[24] More-over it is less resistant to encrustation if bacteriuria is present.[25]

Alternative materials, like thermoplastic elastomers comprising of polyurethane and other similar compounds— were available for several years. These materials have varying degrees of stiffness and, when designed into a more rigid stent, passage over a guide-wire is easily facilitated. Stents made of elastomers like polyurethane have walls that are thinner than silicone stents, hence providing larger lumens with the same outer diameter and, thereby , a higher capacity for urine drainage. But the other associated properties of thermoplastic elastomers makes these materials less resistant than silicone to encrustation. So this characteristic along with the degree of stiffness, causes more irritation to the luminal mucosa when left indwelling for long periods.[26]

New materials and their hydrophilic coatings on both the external and/or internal stent surface aid to increase long-term lubricity, which is highly preferred . Any stent which is slick and smooth reduces

surface friction greatly, allowing for easier passage over the guidewire and facilitates proper positioning.[27]

Other design enhancements which were made include

(a) **composite stents** (dual durometer), that had a firm proximal curl for retention in the renal pelvis with a soft distal curl in the bladder which aids in easy placement and increases patient comfort;

(b) **new thermo-sensitive materials**, which will be stiff initially allowing for rapid and easy placement and later softens at body temperature thus ensuring patient comfort; and

(c) stents with new curl designs and various length configurations that has the advantage of better retention and decreased proximal migration.[28,29]

Despite all these advances, the original concept of the ureteral stent has not changed much since its inception and the Double-J stent has maintained its widespread appeal over the years. In a relatively short time the Double-J has been the impetus for numerous refinements in procedural techniques and has made a significant impact on the management of stone disease and other endourological disorders.[28]

Various natural ,synthetic elastomers and biodegradable and non-biodegradable plastics have been utilized as materials for endourological catheters and stents. Styrenic thermoplastic elastomers like e.g. C-Flex, polysiloxanes and olefinic block co-polymers, e.g. Percuflex, are in general the most preferable non-degradable polymers available for endourological applications till date. Advances in polymer chemistry and surface science have created new pathways for potential improvement of existing materials and the production of new ones despite their limitations. It is becoming increasingly clear that through advances in surface grafting and new material formulation, the next generation of endourological materials on the horizon will emerge with superior long-term implant characteristics.

Glycosaminoglycan-coated stents were developed in bid to resist encrustation and prolong the duration of stenting safely, but failed to garner wider use. [30,31]

A modified design of the Tail Stent™ model was introduced with the aim to minimize irritative symptoms of the bladder . This stent had a proximal pigtail that was of 7 Fr and the shaft that tapered down to a straight tail of 3Fr diameter without a lumen ,that lies in the bladder. They were found to produce lesser irritative symptoms than the standard 7F double J stents in a randomized single-blind trial involving 60 patients.[32,33]

Sof-Curl™ and the Polaris™ stents are the available models of the Dual-durometer stents which at the renal end has a firm bio-material and gradually transitions to a softer end in the bladder end thereby reducing the mechanical irritation of the bladder urothelium.. They are coated with hydrogel that decreases their friction coefficients . [32,33]

INDICATIONS FOR STENTING THE URETER

Stenting of the ureters are done to relieve obstruction of the ureters and to facilitate the flow of urine. Obstruction may be due to various causes like stones , papillary necrosis etc. The stents may have both ends or one end closed. The flow of urine in the ureter is usually around the stent where it acts as a scaffolding. The various indications are[34]

1. Extrinsic obstruction caused by tumors and retroperitoneal fibrosis.
2. Intrinsic obstruction due to stones, stricture or tumors.

In both above scenarios stenting may form either a temporary form of treatment where definitive treatment is being carried out or it may be the primary modality of treatment where definitive treatment is not possible, in situations like

a) bilateral ureteric obstruction

b) Single kidney status

c) Intractable renal colic .

d) Unrelievable ureteric obstruction.

There are many emergency situations which need stenting like ureteric obstruction when it is accompanied with signs of infection (like pyrexia, pyuria and leucocytosis).

During performing percutaneous procedures for stone removal, stenting is necessitated in the following instances like[35,36]

a) When there is perforation of the collecting system

b) In cases where stone burden is more, there may be need for for adjunctive treatment like extracorporeal shock wave lithotripsy

c) Obstruction of the ureter caused by edema

d) Concomitant pelviureteric junction obstruction

e) If stone fragments migrate into the upper ureter

f) Persistent urinary fistula after nephrostomy tube removal.

After ureterorenoscopy for stone disease, stenting is necessary in the following cases[34] :

A) Stone impaction

B) Transient ureteral edema following the procedure which needs to be bypassed.

C) Stents also cause passive dilatation the ureter , hence aiding in passage of the residual stone fragments

D) Prevents stricture formation

E) Incomplete stone fragmentation

F) If concomitant prior ureteral dilatation is done.

G) Perforation of the ureter during the procedure

Stenting is also done in other situations like

A) After endopyelotomy, endoureterotomy to prevent stricture forrnations

B) In cases of urinary extravasation following perforation of the collecting system or ureter.

C) Prior to extracorporeal shock wave lithotripsy if stone size is greater than 2 cm and for management of steinstrasse.

D) To avoid iatrogenic injury during surgery by identifying the ureter.

E) Fistulas of the upper urinary tract due to a renal or ureteral origin

F) To relieve the retroperitoneal urinomas that occur after open or blunt trauma.

G) Obstructive pyelonephritis

H) Renal failure secondary to ureteral obstruction

I) Solitary kidney

J) Transplant kidney

Relative indication :

A) Pregnancy[35]

B) Long-standing impacted stone

C) Recent history of urinary tract infection or sepsis

D) Passive dilation of ureteral orifice and ureter

E) Prolonged endoscopic operative time

F) Patients with imminent post operative plans (2nd look)

PROCEDURE OF STENTING :

Ureteral stenting can be achieved either by retrograde or ante-grade approach. The retrograde approach is most commonly employed using either a cystoscope or an ureteroscope. While using a retrograde approach guide-wires and fluoroscopy are mandatory irrespective of whether a rigid or flexible cystoscopy is used. Initially the guide-wire is passed into the desired ureteric orifice under cystoscopic guidance. Later a stent is advanced over the guide-wire with the aid of a pusher into the ureter through the ureteric orifice and placed at the level of the renal pelvis. Advancement of the stent is monitored using fluoroscopy. Then the stent is allowed to curl in the bladder when the pusher becomes visible at the bladder neck level, by means of carefully removing the guide-wire. [37,38]

STENT RELATED COMPLICATIONS:

Stent discomfort affects over 80% of patients and can vary from one individual to another in an idiosyncratic manner.[39,40]

The symptoms related to ureteral stents are irritative voiding symptoms including frequency (50-60%), urgency (57-60%), dysuria (30-40%), incomplete emptying (76%), flank (20-30%) and suprapubic pain (30%), incontinence, and hematuria (20-25%) are included.[41,42,43,44]

Frequency is caused by the bladder coil which acts as a mechanical stimulus. Together with urgency, it bothers significant proportion of patients (60%). Daytime frequency differentiated by the lack of concomitant nocturia suggests that mechanical stimulation is related to physical activity and/or awareness of this stimulation during the day, which may not be felt during the night. Recently, investigators confirmed that when a stent gets displaced with physical activity that may cause stent discomfort. [45,46]

Urgency is found to be associated directly to the presence of the stent, which may also unveil or exacerbate underlying pre-existing subclinical detrusor overactivity.[45]

Dysuria is commonly experienced at the end of the voiding. Hence it has been put forth that dysuria is caused due to trigonal irritation by the lower end of the stent and more so when it crosses the midline or when it forms an incomplete loop. Trials have showed that urgency and dysuria were mostly seen with longer stents and thereby negatively affected the quality of life of patients .[43,47]

Flank pain seems to be caused as a result of reflux of urine towards the kidney raises the intra-pelvic pressure that thereby produces the pain. The pain is not stimulated by the position of the proximal coil that is in the upper calyx or in the renal pelvis.[48]

Suprapubic pain may be due to a local bladder irritation caused by the distal coil or it can also be associated complications such as encrustation or infection. Hematuria may occur due to the surgical procedure done for the existing disease or due to the stent placement itself .Incontinence occurs concomitant with episodes of urgency, or may be due to stent migration crossing the bladder neck into the proximal urethra hence bypassing the urethral sphincteric mechanism of continence.[34]

Moreover all these symptoms can be as a consequence of associated stent morbidities like urinary tract infection and encrustation,so their presence should always be ruled out by urinalysis and definitive imaging.[49]

ROLE OF ALPHA ADRENERGIC RECEPTORS IN SYMPTOMS OF THE LOWER URINARY TRACT: [50]

Adrenergic receptors were originally divided into αAR and βAR categories, but application of molecular biological methods has confirmed nine total AR subtypes: α1a (formerly named α1c), α1b, α1d, α2a, α2b, α2c, β1, β2, and β3.

α1ARs generally mediate their actions through members of the Gq/11 family of G proteins that stimulate inositol phosphate (membrane phospholipid) hydrolysis, with each subtype demonstrating different efficacy of coupling to phosphoinositide hydrolysis: α1a > α1b > α1d. In addition, α1AR subtypes can be pharmacologically distinguished on the basis of differential binding to α1-antagonists (blockers) as well as differential inactivation by the alkylating agent chloroethylclonidine (CEC).[51] In terms of LUTS, α1AR expression in the prostate, urethra, spinal cord and bladder is important.[52]

TISSUE DISTRIBUTION OF α1-ADRENOCEPTOR SUBTYPES [51,55]

All 3 α1-AR subtypes exist in a wide range of human tissues.The α1A-AR subtype shows highest levels of expression in human liver, followed by slightly lower levels in heart, cerebellum, and cerebral cortex; the α1B-AR subtype has highest expression in human spleen, kidney, and fetal brain; α1D-AR has highest levels in the cerebral cortex and human aorta.

In terms of LUTS, α1-AR expression in prostate, urethra, spinal cord, and bladder is important. Molecular and contraction studies in human prostate tissue demonstrate the α1A-AR subtype predominance

(70%–100%) in prostate stroma. One tissue important in LUTS is the urethra. To date, most studies show that all regions of human urethra (including bladder neck and intra-prostatic urethra) contain only α1A-ARs. Because of reflex arcs, spinal cord α1-AR expression may be important in LUTS.[52,53]

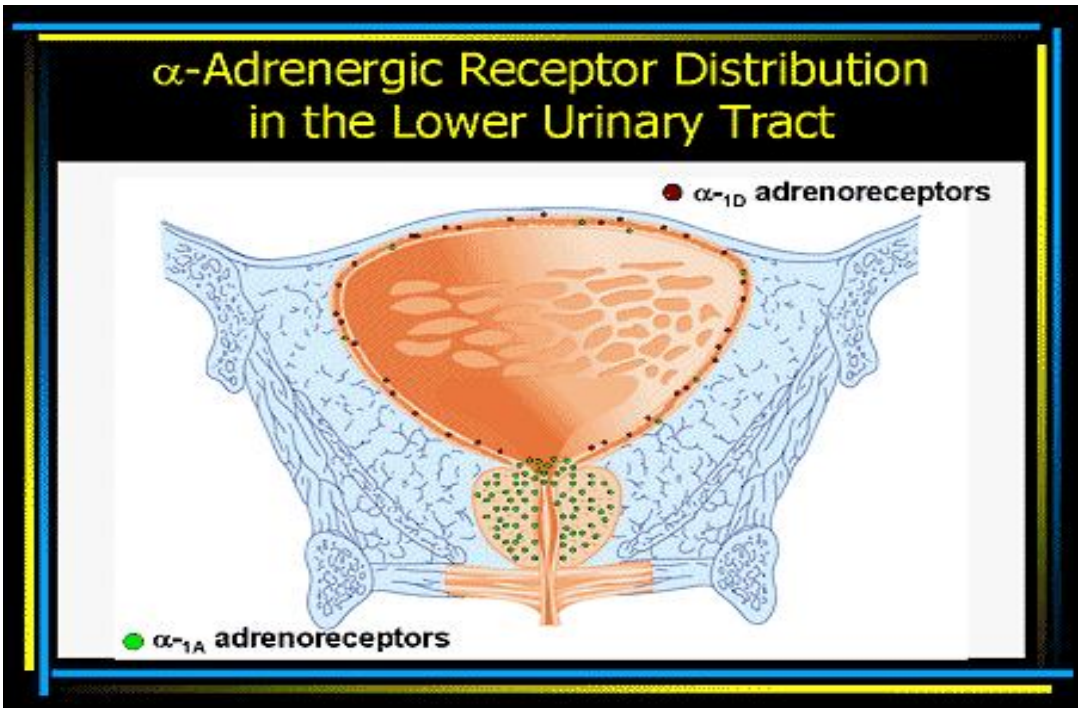
Normal detrusor (bladder smooth muscle tissue) obtained from surgical patients expresses predominantly α1D-ARs, although other subtypes are present to a lesser extent. Studies demonstrating increased α1D-AR expression and function in models of bladder hypertrophy provide a mechanistic explanation for increased irritability symptoms associated with LUTS.[51]

α1-AR antagonists mediate vasodilation in vasculature; therefore, one of the side effects of treating LUTS with α1-AR antagonists is hypotension. α1A-ARs predominate in human splanchnic (mesenteric, splenic, hepatic, and distal omental) arteries.[54]

α1-Adrenoceptors are found in the human ureter, with highest density in the distal ureter. α1-Adrenoceptor antagonists dilates the lumen of the ureter and reduces the spasms by decreasing the peristaltic frequency and inhibiting the basal tone of the ureter, which may lead to improvement in stent-related symptoms. [53]

Classification of α-Adrenergic Blockers and Recommended Doses

CLASS OF α-ADRENERGIC BLOCKER	DOSE
Nonselective	
Phenoxybenzamine	10 mg bid
α_1	
Prazosin	2 mg bid
IR Alfuzosin	2.5 mg tid
Indoramin	20 mg bid
Long-Acting α_1	
Terazosin	5 or 10 mg qd
Doxazosin	4 or 8 mg qd
Alfuzosin SR	10 mg qd
Subtype Selective	
Tamsulosin	0.4 mg qd
Silodosin	8 mg qd



Clinical Pharmacology of Currently Available α_1-Blockers Used to Treat Male Lower Urinary Tract Symptoms

	Alfuzosin	Doxazosin	Silodosin	Tamsulosin	Terazosin
α_1-AR Subtype Selectivity*	Non-Subtype Selective	Non-Subtype Selective	$\alpha_{1A} > \alpha_{1D} > \alpha_{1B}$	$\alpha_{1A} = \alpha_{1D} > \alpha_{1B}$	Non-Subtype Selective
Pharmacologic selectivity	N	N	Y	Y	N
Clinical selectivity‡	N	N	Y	Y	N
Registered for use in hypertension?	N	Y	N	N	Y
Reduces elevated blood pressure?	Y	Y	N	N	Y
Usual daily dose (mg)	7.5-10	1-8	8 mg	0.4	1-10
Regimen (doses/d)	1	1	1	1	1
Modified-release formulation	Y	Y	N	Y	N

AR, adrenergic receptor; N, no; Y, yes.
*Alfuzosin, doxazosin, and terazosin demonstrate similar selectivities for all 3 α_1-AR subtypes.

Efficacy and Adverse Events of α-Blockers

	Alfuzosin*	Doxazosin*	Silodosin‡	Tamsulosin*	Terazosin*
IPSS 3-9 mo/10-16 mo	−4.44	−5.10/−5.63	−6.4/−7.8	−4.63/−7.53‡	−6.22/−5.99
Q_{max} 3-9 mo/10-16 mo	2.05	3.11/2.98	2.6	1.85/1.86‡	2.51/1.94
QoL 3-9 mo/10-16 mo	−1.10	−1.25/−1.47		−1.43	−1.70‡/−1.37
BPH II 3-9 mo/10-16 mo		−2.0/−2.47			1.45‡/−2.09
Asthenia	4	15	NR	7	12
Cardiovascular	1	2	NR	8	2
Dizziness	5	13	3.2	12	15
Gastrointestinal system	10	10	2.6	11	5
Headache	5	8	2.4	12	7
Nasal congestion/rhinitis	6	8	2.1	11	6
Ejaculation problem		0	28.1	10	1
Erection problem	3	4	NR	4	5
Hypotension, asymptomatic	NR	5		7	8
Hypotension, symptomatic	1				3
Hypotension, symptomatic postural		4	2.6	3	6
Hypotension, symptomatic syncope	1	0		1	1

BPH, benign prostatic hyperplasia; IPSS, International Prostate Symptom Score; Q_{max}, peak urine flow rate.
*Based on randomized clinical trials (data from American Urological Association Practice Guidelines Committee[48]).

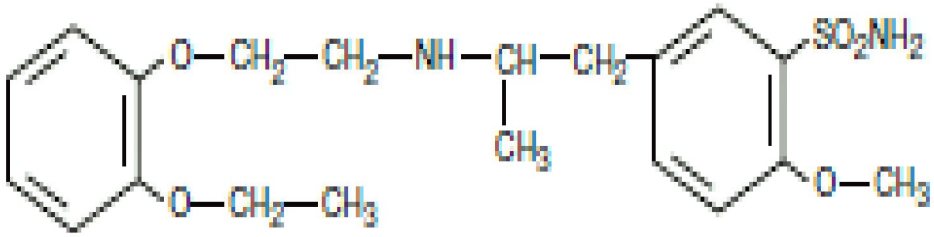
Three α1 ARs (α1a, α1b, and α1d) have been cloned with the use of molecular technologies and have been characterized pharmacologically. Because the α1a AR subtype predominates in the smooth muscle of the prostate and the proximal urethra this subtype has been assumed to be responsible for the dynamic component of obstruction and the related voiding symptoms.. Interestingly, the relative expression of the α1 AR sub-types is changed with chronic outlet obstructive lesions in the rat urinary bladder, with a remarkable increase in bladder α1d AR expression but a decrease in bladder α1a AR expression . These findings imply that the α1D AR may be a new therapeutic target for controlling irritable bladder symptoms. [55]

Tamsulosin is A selective α1A- and α1D-adrenoceptor antagonist, causing relaxation of the smooth muscles in the prostate, bladder neck and distal ureter. It is generally used for the treatment of non-malignant enlargement of the prostate, and also there has been supportive evidence in its use, in the management of distal ureteric stones.[56]

The recently developed selective α1d AR antagonist naftopidil and the selective α1a AR antagonist silodosin are used for the treatment of lower urinary tract symptoms around the world. Interestingly, the

selective α1d AR antagonist naftopidil improves not only voiding symptoms but also storage symptoms in patients with benign prostatic hyperplasia . The improvement of storage symptoms such as urgency and frequency may be assumed to be from the vesical modulation of α1 AR subtypes in chronic urinary obstructive lesions.[50]

TAMSULOSIN:



Tamsulosin

Tamsulosin is a benzenesulfonamide. It is an α1 receptor antagonist with selectivity for α1A and α1D subtypes. The drug is well absorbed, and has a $t_{1/2}$ of 5–10 hours, and is extensively metabolized by Cytochrome P enzymes . Tamsulosin may be administered at a 0.4-mg starting dose.[56,57,58]

ADVERSE EFFECTS:

Tamsulosin affects sexual function in men. It can cause males to experience retrograde ejaculation. Normally, the bladder sphincter contracts and the ejaculate goes to the urethra, the area of least pressure.

In retrograde ejaculation, this sphincter does not function properly. Nonspecific adverse effects are headache, dizziness, asthenia and rhinitis. Other important adverse effects are the floppy iris syndrome, postural hypotension and syncope. [58]

Tamsulosin at the recommended dose of 0.4 mg daily is less likely to cause orthostatic hypotension than the other drugs in this class .

Tamsulosin in occasional cases can cause a drop in blood pressure, resulting in dizziness or fainting. Other reported side effects include vertigo, headache, nasal congestion and palpitations.[58]

SYMPTOM ASSESSMENT TOOLS :

The first study done to objectively evaluate the symptomatology associated with stents was carried out by Joshi et al. They prospectively assessed the bother and prevalence of various urinary tract symptoms caused by ureteral indwelling catheters by means of validated questionnaires (International Prostatic Symptoms Score, International Continence Society male questionnaire, Quality of Life questionnaires, and the Bristol Female Lower Urinary Tract Symptoms questionnaire. Though they were definite in demonstrating the association of urinary symptoms due to stents and the negative impact on the quality of life of

the patients. The most important impact was by bringing to attention the need for the development of a stent-specific symptom measuring tool.

With the aim of improving clinical decision making and practice, they incidentally developed and validated a questionnaire to specifically address this purpose. The Ureteral Stent Symptom Questionnaire (USSQ)[59] consisted of 38 items which examined 6 sections: pain, voiding symptoms, work performance, sexual quotient , overall general health, and additional problems.[59]

MATERIALS AND METHODS

This is a prospective study conducted from February 2013 to January 2014 at Government Stanley Hospital . A total of 180 patients were enrolled in his study after following the exclusion and inclusion criteria. They are as follows

INCLUSION CRITERIA:

a) Patients undergoing semirgid ureteroscopy with DJ stenting .

b) Only patients with uncomplicated ureteric calculi.

EXCLUSION CRITERIA:

1. Patients with growth in Urine culture or having symptomatic urinary tract infection.
2. Patients who may need bilateral stent insertion for acute obstruction / obstructive uropathy
3. Male patients with history of prostatic enlargement, prostatitis or prostatic cancer related lower urinary tract symptoms
4. Females with lower urinary tract symptoms related to any form of urinary incontinence, uterine/cervical/vaginal prolapse, or obstruction related to malignancy.

5. History of chronic or recent α-blocker or analgesic drug use were excluded.

6. Pregnancy,

7. Bleeding disorders,

8. Patients with concomitant other lower tract pathology like bladder cancer, bladder outlet obstruction with or without stones, urethral stricture.

9. Patients with simultaneous renal calculus.

10. Patients who underwent open surgery for ureteric calculi previously.

Methodology:

These patients were evaluated by taking a detailed history followed by a complete clinical examination . Relevant past, personal history and clinical data along with co-morbid factors are noted. Routine blood investigations along with renal function test including blood urea and serum creatinine level, urinalysis and urine culture sensitivity were done and recorded. Further evaluation in the form of X ray KUB , USG abdomen and pelvis, were done both pre-operatively and

post-operatively. Based on this data diagnosis was made and planned for ureteroscopy and DJ stenting. Anesthetist fitness was obtained for surgery accordingly. An informed consent and consent for stenting was obtained from the patient after clearly explaining about the procedure and the implications. Indication for stent placement in each case was noted. Patients are given a questionnaire to assess the baseline symptoms using the IPSS questionnaire along with the quality of life component of the chart as prescribed by AUA guidelines. Also the pain component is evaluated by the Visual Analog Pain Scale™ followed universally. Scoring is done after adequately explaining about each component of the chart.

Under spinal anesthesia ,patient was placed in the lithotomy position with ipsilateral leg lower and straighter to facilitate easy ureteroscope entry. Cystoscopy was done using 20 Fr sheath . 30 degree scope. The entire urethra assessed and bladder visualized for any associated pathology. Both ureteric orifices were visualized and 0.032 inch guide wire passed into the ipsilateral ureter containing the stone. Then the cystoscope was removed and 8 Fr infant feeding tube was passed into the bladder. 8/9.8 Fr semirigid ureteroscope was passed into the ureter under normal saline irrigation and passed proximally up into the ureter until the calculus is visualized. Patients with intra-operative

findings of difficult ureteroscope entry, ureteric stricture, dense stone impaction, edema and bleeding were excluded from the study. Then using pneumatic lithotripsy stone is fragmented completely. Following this patients underwent DJ stenting with 5 Fr/26 cm one end open silastic DJ stent. Patients who had residual stone fragments that could not be fragmented at all were exclude from the study. Post-operatively patients were explained about the presence of DJ stent, and the need to come for stent removal after 2 weeks (14 days).

A post-operative imaging is done to confirm the position of the stent. Then the patients are discharged on the 2^{nd} /3^{rd} post operative day if there is no significant event and are prescribed medicines as per the group they are allotted to based on the Random number chart.

STUDY DESIGN:

Patients were prospectively randomized by random-number chart into two groups.

Group A comprised of patients who received Tab. Ciprofloxacin 500mg twice daily and Tab. Paracetamol 500 mg thrice daily for three days.

Group B comprised of patients who received Tab Ciprofloxacin 500mg twice daily, Tab. Paracetamol 500 mg thrice daily for three days and Tab.Tamsulosin 0.4mg once daily for two weeks (14 days).

URINARY TRACT SYMPTOM ASSESSMENT:

The International Prostate Symptom Score (IPSS) questionnaire[60,61] was used to assess patients' symptoms on admission as a, baseline before patient under went the surgery and again reassessed after two weeks when the patient came for stent removal.

The IPSS questionnaire consists of seven questions, four relating to voiding (obstructive) symptoms and three to storage(irritative) symptoms. Responses were graded on a five-point rating scale. The maximum scores for voiding and storage symptoms are 20 and 15, respectively; the higher the score, the worse are the symptoms.

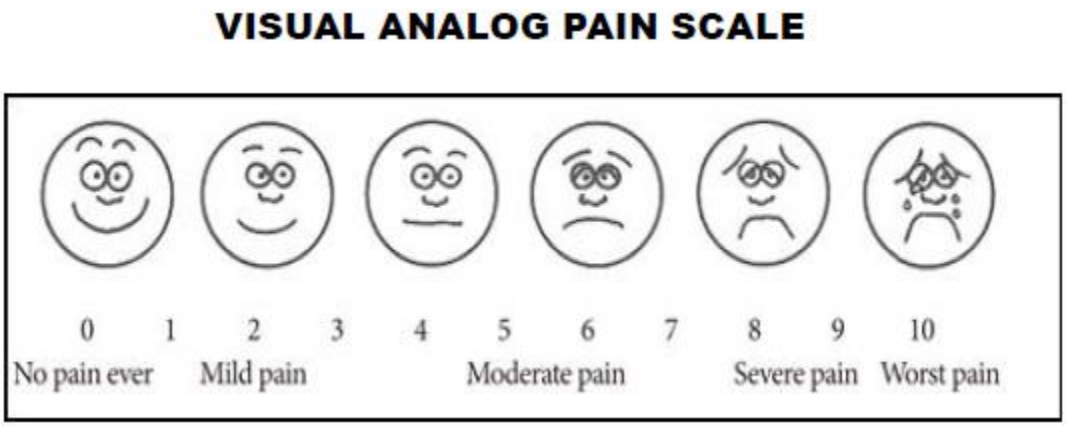
QUALITY OF LIFE ASSESSMENT :

Quality of life (QofL) was assessed on admission as a, baseline before patient under went the surgery and again reassessed after two weeks when the patient came for stent removal using the QofL section of the IPSS questionnaire.

VISUAL ANALOG PAIN SCALE :

Also the pain component is evaluated by the Visual Analog Pain Scale™ · on admission as a, baseline before patient under went the surgery and again reassessed after two weeks when the patient came for stent removal.

All the scoring is done after adequately explaining about each component of the chart each time.



They were asked to report to the casualty department in case of any emergency. A discharge summary was given with clear instructions and a stent diary was maintained in the department with all details about patient particulars like address, contact phone number, and probable date of of stent removal and maintained regularly.

Stent removal was done under local anesthesia as an outpatient procedure using 20Fr /30 degree scope.

STATISTICAL ANALYSES :

Data were analysed using $\chi 2$ test , Student's *t* test, Independent sample T test and paired sample T test .

PROFORMA

1) Name:
2) Age & sex :
3) OP/ IP No:
4) Address and Phone No:
5) Diagnosis :
6) Procedure done :
7) Indication for stenting :
8) a. Date of stenting :

   b. date of removal :

   c. total duration of indwelling :
9) Constituent Symptoms:Assessed by IPSS symptom score with QofL score and Visual Analog Pain Scale

S.no		BASELINE	AT STENT REMOVAL
1.	IPSS SCORE A) Irritative symptom		
	B) Obstructive symptom		
2.	Quality of life		
3.	Visual analog scale		

10) INVESTIGATIONS

PRE-OPERATIVELY

A. CLINICAL B. XRAY /USG KUB C.URINE & BLOOD INVESTIGATIONS

POST-OPERATIVELY:

A. CLINICAL B. XRAY /USG KUB C.URINE & BLOOD INVESTIGATIONS

International prostate symptom score (IPSS)

Name: Date:

	Not at all	Less than 1 time in 5	Less than half the	About half the time	More than half the	Almost always	Your score
Incomplete emptying Over the past month, how often have you had a sensation of not emptying your bladder completely after you finish urinating?	0	1	2	3	4	5	
Frequency Over the past month, how often have you had to urinate again less than two hours after you finished urinating?	0	1	2	3	4	5	
Intermittency Over the past month, how often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
Urgency Over the last month, how difficult have you found it to postpone urination?	0	1	2	3	4	5	
Weak stream Over the past month, how often have you had a weak urinary stream?	0	1	2	3	4	5	
Straining Over the past month, how often have you had to push or strain to begin urination?	0	1	2	3	4	5	

	None	1 time	2 times	3 times	4 times	5 times or more	Your score
Nocturia Over the past month, many times did you most typically get up to urinate from the time you went to bed until the time you got up in the morning?	0	1	2	3	4	5	

Total IPSS score	

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

Total score: 0-7 Mildly symptomatic; 8-19 moderately symptomatic; 20-35 severely symptomatic.

RESULTS

This is a prospective study conducted from February 2013 to January 2014 at Government Stanley Hospital . A total of 180 patients were enrolled in this study after following the exclusion and inclusion criteria.

Patients were prospectively randomized by random-number chart into two groups.

Group A comprised of patients who received Tab. Ciprofloxacin 500mg twice daily and Tab. Paracetamol 500 mg thrice daily for three days.

Group B comprised of patients who received Tab Ciprofloxacin 500mg twice daily, Tab. Paracetamol 500 mg thrice daily for three days and Tab. Tamsulosin 0.4mg once daily for two weeks (14 days).

The mean age of patients in Group A and was 35.79 with an age range of 10 to 62 years . The mean age of patients in Group B was 36.62 with an age range of 13 to 64 years.

S.NO	Characteristics	Group A	Group B
1	No. Of patients	90	90
2	AGE		
	Mean	35.79	36.62
	Range	10 to 62	13 to 64
3	GENDER		
	Male	58	54
	Female	32	36
4	LOCATION OF CALCULUS		
	Upper ureteric	25	24
	Mid ureteric	12	10
	Lower ureteric	53	56
5	SIDE		
	RIGHT	43	48
	LEFT	47	42

TABLE 1: MASTER CHART OF PATIENT AND STONE CHARACTERISTICS

1. AGE AND SEX DISTRIBUTION

The mean age of patients in Group A and was 35.79 with an age range of 10 to 62 years . The mean age of patients in Group B was 36.62 with an age range of 13 to 64 years.

In Group A consisted of 58 men and 32 women whereas Group B had 54 men and 36 women.

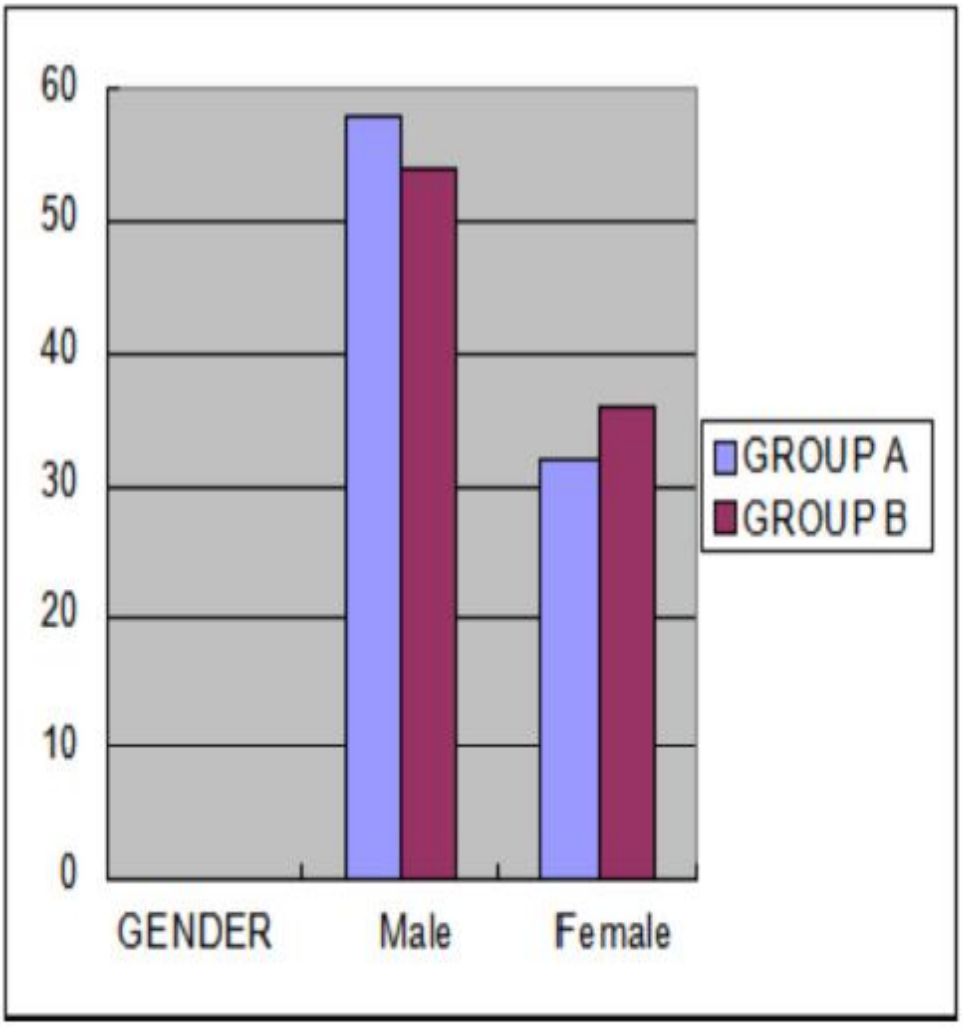
	GROUP A	GROUP B
AGE		
Mean	35.79	36.62
Range	10 to 62	13 to 64

TABLE 2 : AGE DISTRIBUTION

SEX DISTRIBUTION

	GROUP A	GROUP B
GENDER		
Male	58	54
Female	32	36

TABLE 3 : SEX DISTRIBUTION



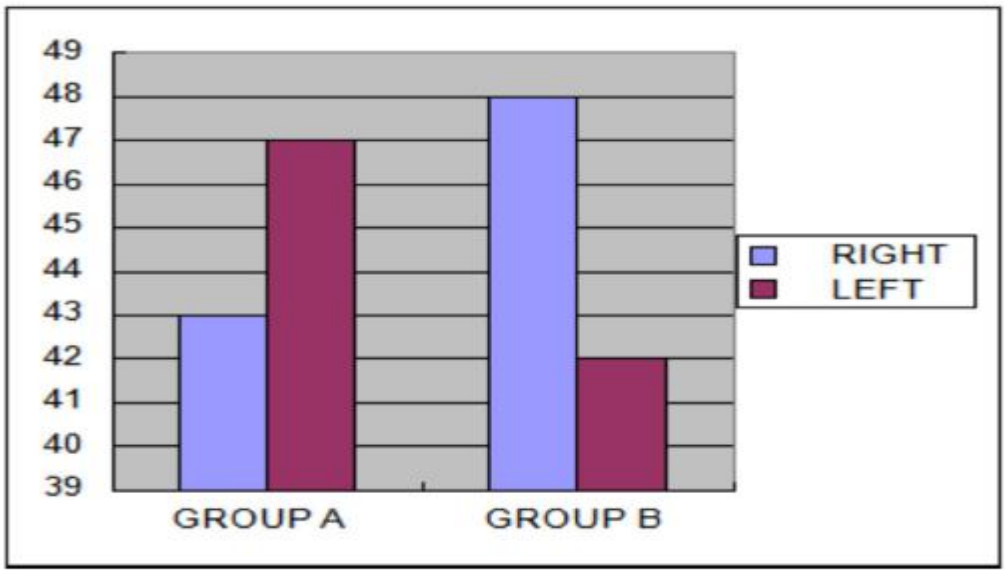
2. STONE CHARACTERISTICS

In Group A 25 ,12 and 53 patients had upper, mid and lower ureteric calculus respectively. In Group B 24,10 and 56 patients had lower ureteric calculus respectively.

STONE CHARACTERISTICS CHART

	STONE CHARACTERISTICS	GROUP A	GROUP B
1	LOCATION OF CALCULUS		
	Upper ureteric	25	24
	Mid ureteric	12	10
	Lower ureteric	53	56
2	SIDE		
	RIGHT	43	48
	LEFT	47	42

TABLE 4 : STONE CHARACTERISTICS CHART

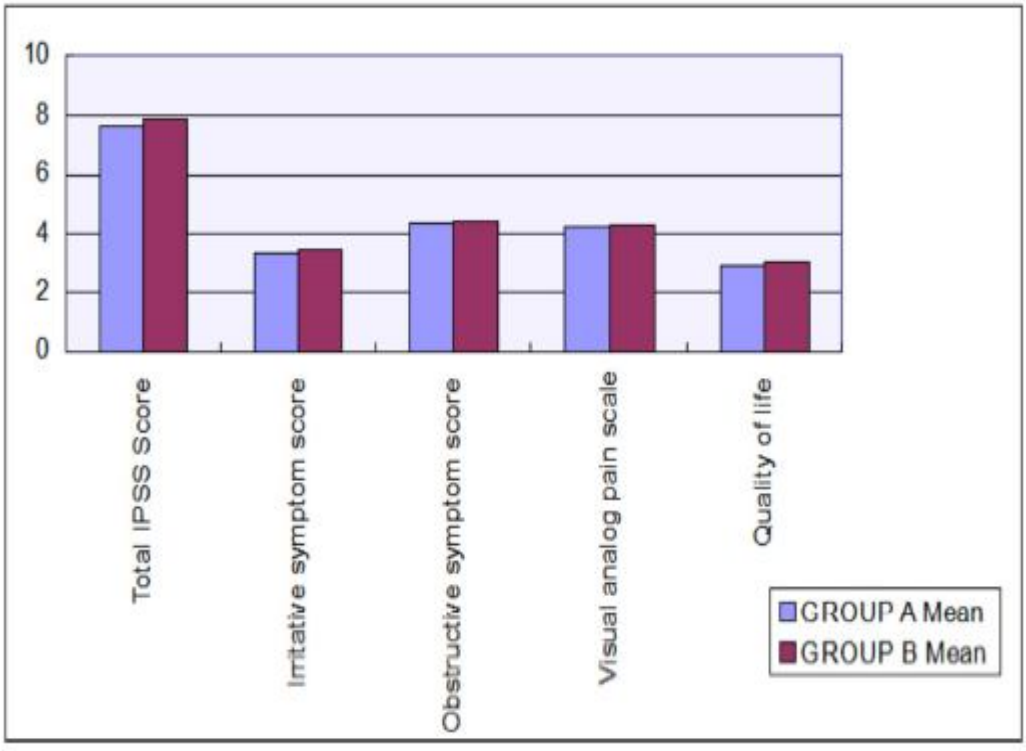


BAR CHART SHOWING DISTRIBUTION OF SIDE

COMPARISON OF BOTH GROUPS AT BASELINE :

	Group A		Group B		P value
	Mean	SD	Mean	SD	
Total IPSS Score	7.68	2.18	7.91	1.77	0.431
Irritative symptom score	3.32	0.99	3.48	1.01	0.298
Obstructive symptom score	4.36	1.39	4.43	1.04	0.672
Visual analog pain scale	4.24	1.04	4.31	1.08	0.674
Quality of life	2.89	0.68	3.06	0.61	0.084

TABLE 5 : COMPARISON OF BOTH GROUPS AT BASELINE



COMPARISON OF BOTH GROUPS AT BASELINE

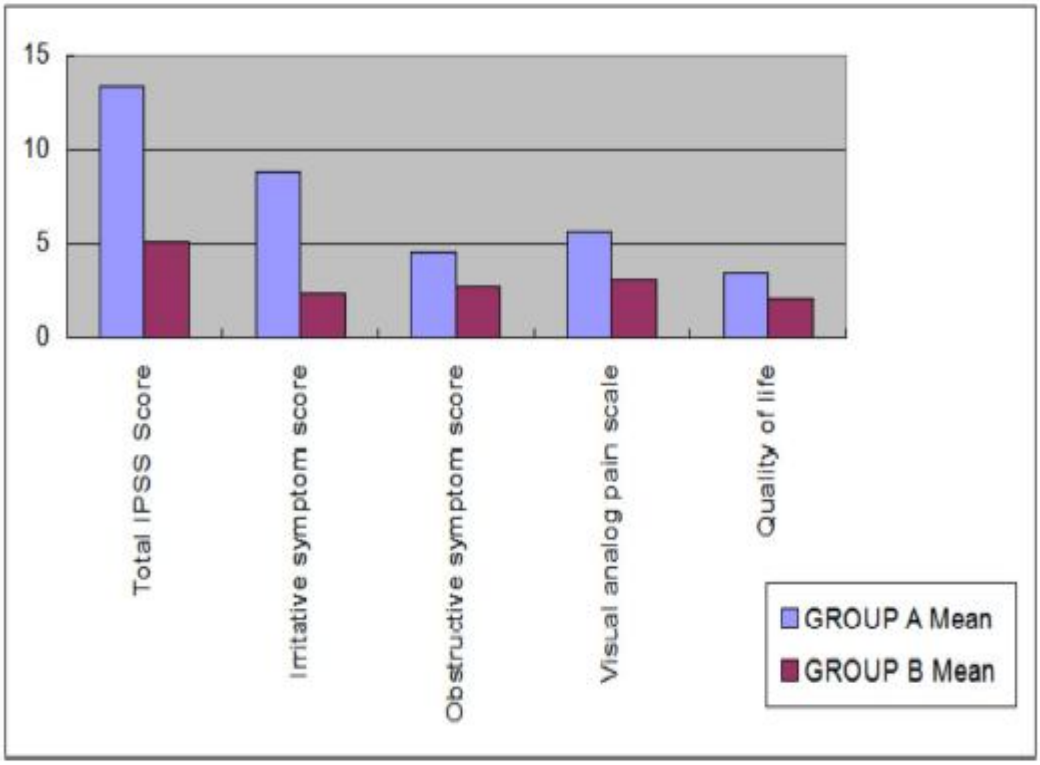
On comparing both the groups A and B based on the symptom scores assessed at baseline the following observations were made. The mean IPSS score of group A was 7.68 (SD 2.18) with an irritative score of 3.32 (SD 0.99) and obstructive score of 4.36 (SD1.39) and in group B the means of IPSS score, irritative score and obstructive symptom score were 7.91(SD 1.77), 3.48(SD 1.01) and 4.43 (SD 1.04). The P value of the above three mean's compared between these two groups were 0.431for IPSS score,0.298 for irritative score and 0.672 for obstructive score , indicating that there was not much difference between the two groups.

The mean visual analog pain scores for group A and B were 4.24 (SD1.04) and 4.31 (SD 1.08). The mean of Quality of Life scores were 2.89(SD 0.68) and 3.06 (SD 0.084) for group A and B respectively. Again they indicate that there was no difference in symptoms and bother between the two groups. So the chosen sample population in both the groups were the same at baseline since the difference between them were not statistically significant.

COMPARISON OF BOTH GROUPS AT STENT REMOVAL :

	Group A		Group B		
	Mean	SD	Mean	SD	P value
Total IPSS Score	13.37	2.13	5.12	0.67	<0.001
Irritatve symptom score	8.82	1.76	2.34	0.50	<0.001
Obstructive symptom score	4.54	0.75	2.78	0.70	<0.001
Visual analog pain scale	5.67	0.92	3.10	0.70	<0.001
Quality of life	3.43	0.81	2.08	0.74	<0.001

TABLE 6 : COMPARISON OF BOTH GROUPS AT STENT REMOVAL



COMPARISON OF BOTH GROUPS AT STENT REMOVAL

On comparing both the groups A and B based on the symptom scores assessed at stent removal after 2 weeks(14 days) the following observations were made.

The mean IPSS score of group A was 13.37(SD 2.13) with an irritative score of 8.82 (SD 1.76) and obstructive score of 4.54(SD 0.75) and in group B the means of IPSS score, irritative score and obstructive symptom score were 5.12(SD0.67), 2.34(SD 0.50) and 2.78 (SD 0.70). The P value of the above three mean's compared between these two groups were all <0.001 indicating, that the difference between these two groups based on these symptom scores were all statistically significant.

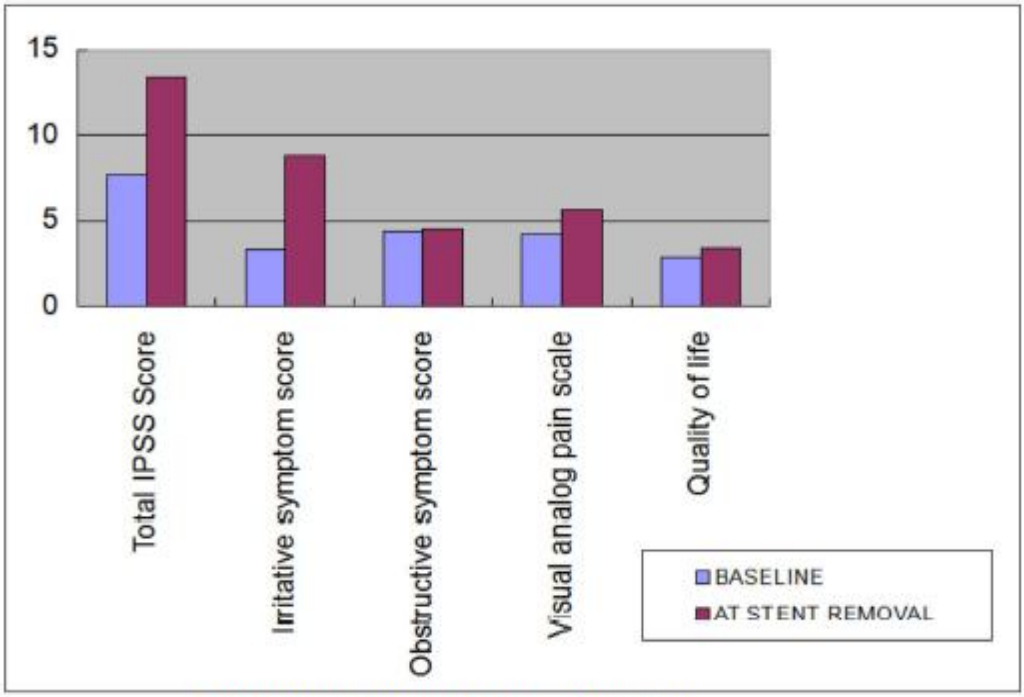
The mean visual analog pain scores for group A and B were 5.67(SD0.92) and 3.10(SD 0.70). The mean of Quality of Life scores were 3.43(SD 0.81) and 2.08 (SD 0.74) for group A and B respectively. Again both the above observations indicate that the difference in symptoms and bother between the two groups were statistically significant. Hence it indicates that patients in group B who received tab. Tamsulosin 0.4 mg for 2 weeks showed lesser quantum of symptoms and benefited as compared to those who did not receive it (group A) and the difference is statistically significant .

COMPARISION WITHIN THE GROUPS :

COMPARISION WITHIN GROUP A

VARIABLES	Group A				P value
	BASELINE		AT STENT REMOVAL		
	Mean	SD	Mean	SD	
Total IPSS Score	7.68	2.177	13.37	2.133	<0.001
Irritative symptom score	3.32	0.992	8.82	1.765	<0.001
Obstructive symptom score	4.36	1.393	4.55	0.752	<0.135
Visual Analog Pain Scale	4.24	1.042	5.67	0.924	<0.001
Quality of life	2.89	0.678	3.43	0.808	<0.001

TABLE 7: COMPARISION WITHIN GROUP A



COMPARISION WITHIN GROUP A

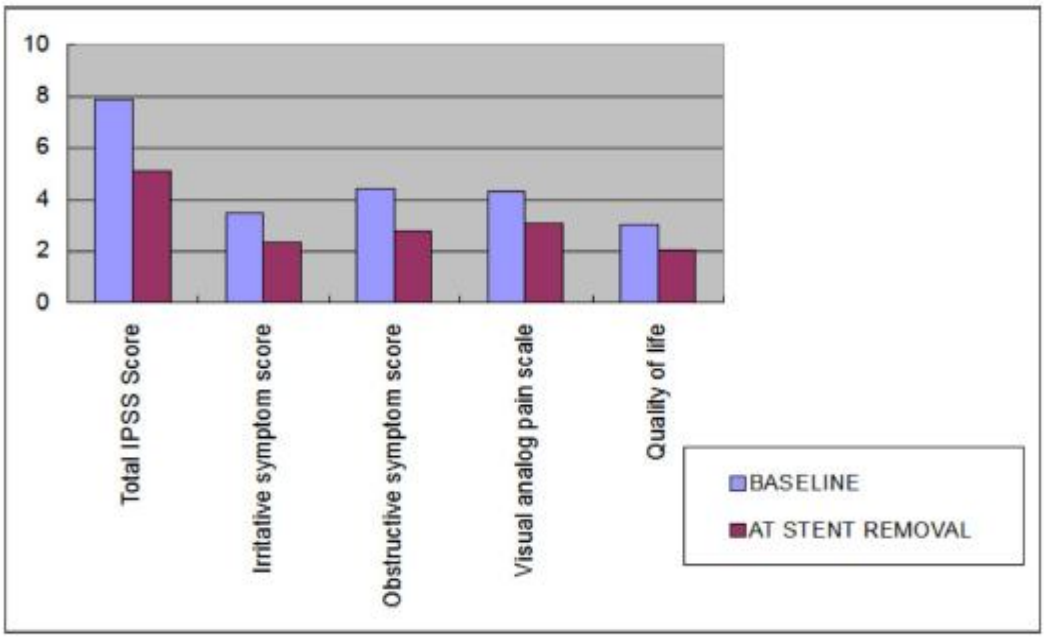
In group A at baseline the mean of IPSS score was 7.68(SD2.177), irritative score was 3.32(SD 0.992), obstructive score was 4.36(SD 1.393), visual analog scale was 4.24(SD 1.042) and the quality of life score was 2.89 (SD0.678), but at stent removal the mean these scores were 13.37 (SD 2.133) for IPSS,8.82 (SD 1.765) for irritative score, 4.55(SD 0.752) for obstructive score, 5.67 (SD 0.924) for visual analog scale and 3.43(SD 0.808) for quality of life score.

These P values of the corresponding means for the variables like IPSS score, irritative score, visual analog pain scale and quality of life scale were statistically significant (<0.001) indicating that the among patients who underwent stenting and did not receive tab. Tamsulosin 0.4 mg the symptom scores at baseline had worsened except for the obstructive score whose P value was 0.135 and was not statistically significant.

COMPARISION WITHIN GROUP B

VARIABLES	Group B				P value
	BASELINE		AT STENT REMOVAL		
	Mean	SD	Mean	SD	
Total IPSS Score	7.91	1.771	5.12	0.668	<0.001
Irritatve symptom score	3.48	1.008	2.34	0.501	<0.001
Obstructive symptom scorel	4.43	1.039	2.78	0.700	<0.001
Visual Analog pain scale	4.31	1.077	3.1	0.704	<0.001
Quality of life	3.06	0.606	2.07	0.738	<0.001

TABLE 8: COMPARISION WITHIN GROUP B



COMPARISION WITHIN GROUP B

In group B at baseline the mean of IPSS score was 7.91(SD1.771), irritative score was 3.48(SD 1.008), obstructive score was 4.43(SD 1.039), visual analog scale was 4.31 (SD1.077) and the quality of life score was 3.06 (SD 0.606) , but at stent removal the mean of these scores were 5.12(SD 0.668) for IPSS, 2.34(SD 0.501) for irritative score, 2.78 (SD 0.700) for obstructive score, 3.1(SD 0.704) for visual analog scale and 2.07(SD 0.738) for quality of life score.

The P values of the corresponding means for the variables like IPSS score, irritative score, obstructive score, visual analog pain scale and quality of life scale were all statistically significant (<0.001) indicating that among patients who underwent stenting and received tab. Tamsulosin 0.4 mg the symptom scores at baseline did not show worsening of symptoms after stenting at 2 weeks and also showed considerable improvement in symptom scores over the baseline .

DISCUSSION

Urolithiasis is one of the oldest and commonest problems afflicting the urinary tract. In recent times ureteroscopy, is among the most common endourological procedures performed across the world. Despite the various genuine indications for stenting, ureteral stents are observed to be overused in current urology practice.

In a study conducted by Auge and colleagues, among community and practicing urologists from centers all over the world they reported that 98% of them would perform ureteroscopic stone surgery as a routine. Among these, two-thirds of them would place a stent more than half (>50%) of the time and 13% would always prefer to place a post-operative stent, even though stent related symptoms and morbidity were a significant problem faced by patients (98%).

Despite advances and refinements in stent design and material ,extensive use of ureteral stenting following endourologic surgeries,is associated with considerable morbidities comprising of urinary symptoms, pain and a definite impact on quality of life of the patient. In our study among the group A patients ,the data and the subsequent observations suggest that stenting has produced significant ($P<0.001$) symptoms related to it. Joshi et al and Miyako et al have

shown that stent related symptoms occur in about more than 80% of the patients and is a common problem faced by the patient and dealt routinely by the urologist.

The cause of stent-related symptoms and the mechanisms involved are not fully understood and it is contemplated that the involuntary contraction of the bladder secondary to irritation of the trigone contributes to the bothersome urinary symptoms. In addition, increased resistance to bladder outlet and pressure generated during micturition lead to reflux of urine .

Alpha-blockers reduce flank pain by causing a decrease in the muscle tone of the ureter, trigone of the bladder and prostatic urethra by means of blocking the α-adrenergic receptors and thereby decreasing the bladder outlet resistance and the pressure developed during micturition. In our study it is observed that patients who received Tab. Tamsulosin 0.4 mg following stenting showed definitely lesser symptoms overall and also demonstrated a significant reduction in their baseline bother symptoms. This indicates to the comprehensive effect of tamsulosin in lower urinary tract symptoms which is due to its action on α1A and α1D receptors distributed across the lower urinary tract.

Considering and study and two meta-analyses that were been recently published , it seems that α-blockers can effectively relieve stent-related symptoms.

The patients receiving Tamsulosin experienced significant reductions in the total IPSS, irritative subscore, flank and voiding pains, and QoL compared with those that did not receive it.

Although all patients had correct stent placement at discharge, one patient in the tamsulosin group and three patients in the group that did not receive it complained of severe pain and the stents were removed much earlier in all the 4 patients (3 in group A and 1 in group B)and were excluded from the study. Also 5 patients developed hematuria during the course of the study in the post-operative period and were excluded from the study.

So stent related morbidity a common problem faced by every urologist, which puts them through a dilemma, in which case every scenario has to weighed against the pros and cons. Stenting per se causes unnecessary increase in cost in the form of extra procedure to remove it and the cost towards the stent and the cost involved in treating the complications and the lingering odd risk of forgotten stent which might present at a later date with a variety of problems like

encrustation ,renal calculi ,infection ,sepsis and the difficult scenario of renal failure. At same time in cases where stenting is done for genuine causes the related symptoms can be treated effectively by α-blockers like Tamsulosin.

LIMITATIONS OF THE STUDY :

1) We applied stents of same size and length for all patients; however, some studies have shown that the stent length is directly proportional with stent-related symptoms , and some studies have shown evidence to the contrary. Given this point, we used same length (26 cm /5Fr) stents, for all the patients.

2) We used the IPSS scoring for evaluation of urinary symptoms, but Joshi et al. have developed a specific tool for assessing stent-related symptoms which is named “ureteric stent symptoms questionnaire” (USSQ). Although, it has been previously implemented, we could not apply it due to complexity of the variables involved and its validity and reliability which were not confirmed till date.

CONCLUSION

- Stenting the ureters following endourologic procedures though being done routinely is not without its problems. It is most commonly associated with considerable symptoms, like irritative voiding symptoms, pain and bother so much, that it affects the quality of life of the patient significantly.

- The quantum of pain , irritative symptoms and afflicted quality of life which the patient is put through should be borne in mind and carefully weighed against the benefits they might provide and the decision should be individualized in each patient every time.

- In such cases where stenting is being done ,the patient should be given the benefit of having the stent and at the same time his symptoms should be alleviated by the judicial use of tablet tamsulosin 0.4mg once daily for 14 days.

- Stent related morbidity is an entity in itself, and the influence of α adrenergic receptor blockers like Tamsulosin over the irritative symptoms is significant due to the distrbution of the α1A and α1D in the lower tract of the urinary system.

- Pain produced by stent may range from flank pain to suprapubic pain to dysuria and the occasional non specific lower abdominal pain, which affects the quality of life of the patient significantly. The routine use of non steroidal anti-inflammatory drugs like paracetamol do not seem have much influence over the lower urinary tract pain and associated symptoms.

- Definitely, patients those of whom are prescribed non selective α adrenergic receptor blockers like Tamsulosin ,following stenting ,seem to benefit significantly because not only did they experience much lesser symptoms and bother, but they also improved over their symptoms with which they presented at admission. This would concur to the explicit influence these group of α adrenergic receptor blockers have over the lower urinary tract and gives them a definite role in treating patients afflicted with stent related morbidity.

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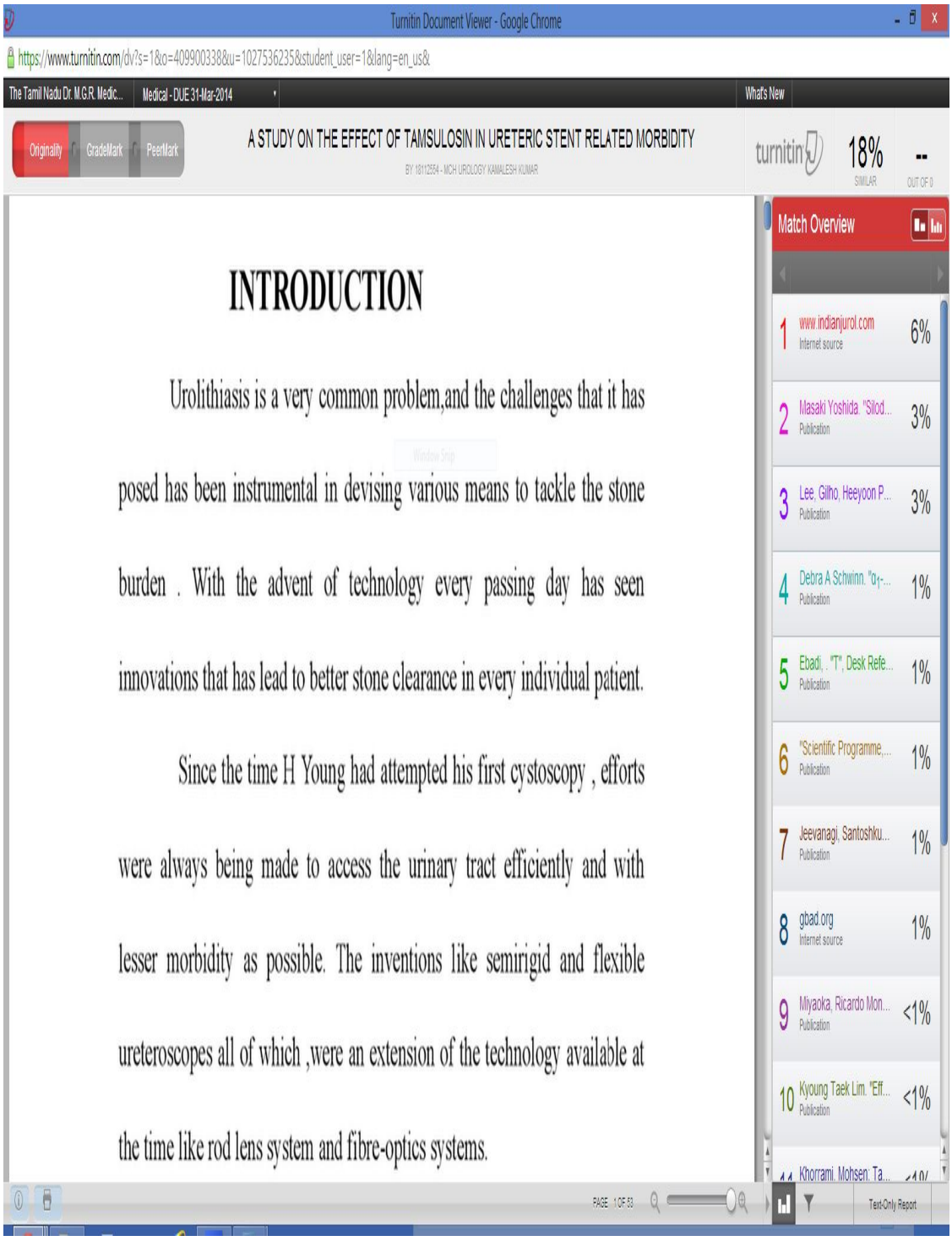
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INTRODUCTION
Urolithiasis is a very common problem,and the challenges that it has posed has been instrumental in devising various means to tackle the stone burden . With the advent of technology every passing day has seen innovations that has lead to better stone clearance in every individual patient.
Since the time H Young had attempted his first cystoscopy , efforts were always being made to access the urinary tract efficiently and with lesser morbidity as possible. The inventions like semirigid and flexible ureteroscopes all of which ,were an extension of the technology available at the time like rod lens system and fibre-optics systems.
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INTRODUCTION

PROFORMA

1) Name:
2) Age & sex :
3) OP/ IP No:
4) Address and Phone No:
5) Diagnosis :
6) Procedure done :
7) Indication for stenting :
8) a. Date of stenting :

   b. date of removal :

   c. total duration of indwelling :
9) Constituent Symptoms:Assessed by IPSS symptom score with QofL score and Visual Analog Pain Scale

S.no		BASELINE	AT STENT REMOVAL
1.	IPSS SCORE A) Irritative symptom B) Obstructive symptom		
2.	Quality of life		
3.	Visual analog scale		

10) INVESTIGATIONS

PRE-OPERATIVELY

A. CLINICAL B. XRAY /USG KUB C.URINE & BLOOD INVESTIGATIONS

POST-OPERATIVELY:

A. CLINICAL B. XRAY /USG KUB C.URINE & BLOOD INVESTIGATIONS

நோயாளிகளுக்கான ஆலோசனை

சிறுநீரக குழாய்கள் சிறுநீரை சிறுநீரகத்தில் இருந்து சிறுநீர்பைக்கு கொண்டுசெல்கின்றன .இந்த சிறுநீர் பாதையில் கற்களினால் அடைப்பு ஏற்பட வாய்ப்பு உள்ளது .இது போன்ற அடைப்பினை நுண் உள் நோக்கி கருவி மூலமாக நீக்க முடியும் . இது போன்ற அறுவை சிகிச்சைக்கு பின்னர் சிறுநீரக குழாய்களில் ஸ்டென்ட் என்ற கருவி பொருத்தப்படும்.. இவை 10 -- 14 நாட்களில் அகற்றப்படும். இது முற்றிலும் மிகவும் பாதுகாப்பானது .மேலும் இந்த ஸ்டென்ட் பொருத்துவதினால் ஒரு சிலருக்கு பக்க விளைவுகள் ஏற்படலாம் இந்த பின் விளைவுகளை டாம்சுலோசின் என்ற மருந்தினால் குறைக்க முடியும் என்பதனை பற்றி ஆராய்வதற்காக நான் ஒரு ஆய்வு மேற்கொண்டுள்ளேன் .

இந்த கண்காணிக்கப்பட்ட மருத்துவ ஆய்விற்கு தாங்களும் பதிவு செய்து தங்களது முழு ஒத்துழைப்பை நல்குமாறு தங்களை அன்புடன் கேட்டுகொள்கிறேன் .

நோயாளிகள் ஒப்புதல்

இந்த சிகிச்சை, மற்றும் அதற்க்கான பரிசோதனை மற்றும் நடத்தப்படும் ஆய்வை பற்றி முழுமையாக மருத்துவர் விளக்கினார். நான் இந்த ஆய்வில் பங்கெடுக்க முழு மனதுடன் சம்மதம் தெரிவிகின்றேன் .

நோயாளியின்

கையொப்பம்

அனுப்புனர்

பெயர் :

தந்தை பெயர் :

முகவரி :

வயது :

பெறுநர்

ஐயா,

நான் மேற்சொன்ன முகவரியில் வசித்து வருகிறேன்.தற்போது ..... தொழில் செய்து வருகிறேன். எனக்கு சிறுநீரக குழாய்களில்அடைப்பு ஏற்பட்டுள்ளது என்றும் அதனை நீக்க அறுவை சிகிச்சை மற்றும் ஸ்டேன்ட் பொருத்திக்கொள்ள வேண்டும் என்றும் மருத்துவர் கூறினார். எனக்கு சிறுநீரக குழாய்களில் ஏற்பட்டுள்ள அடைப்பின்னை நீக்கவும் மேற்கொண்டு அடைப்பு ஏற்படாமலிருக்க ,எனக்கு செய்யவுள்ள அறுவை சிகிச்சையின் ஒரு பகுதியாக ஸ்டேன்ட் பொருத்திக்கொள்ளவும் சம்மதம் இந்த நோயை பற்றிய சந்தேகங்களை நான் கேட்க விளக்கினார்.இந்த ஆபரேஷன் தன்மை, பக்க மற்றும் பின் விளைவுகளையும் மருத்துவர் விளக்கினார்.

. இந்த ஆய்வினால் எனக்கும், பொதுவாக மற்ற நோயாளிகளுக்கும் கிடைக்க கூடிய நன்மைகள் எனக்கு எடுத்துரைக்கப்பட்டன. இந்த ஆய்வு குறித்து, நான் எழுப்பிய வினாக்கள் மற்றும் சந்தேகங்களுக்கு மருத்துவர் விளக்கமாக பதிலளித்தார். இவற்றை தெரிந்து கொண்ட நான் எனது சுய நினைவுடன் இந்த ஆய்வில் பங்கேற்க எனது விருப்பத்தின்பேரில் யாருடைய நிர்பந்தமும் இல்லாமல் என் சுய நினைவுடன் இந்த ஆய்வில் பங்கேற்க எனது விருப்பத்தை தெரிவித்துக்கொள்கிறேன். இந்த ஆய்வு, என்னுடைய, மற்றும் என் போன்ற நோயாளியர் நலன் கருதியே செய்யப்படுகிறது என்பதை அறிந்ததால் இதற்கு என்னை ஆட்படதுகின்றேன்.

இந்த ஆய்வு குறித்து முழு விவரங்களை நான் கேட்டு பெற்றுள்ளதாலும், என்னுடைய விருப்பத்தின்பேரில் பங்கு

கொள்வதாலும், இது குறித்து எந்த குற்ற முறையீட்டையும் மருத்துவர் மீதோ, ஏனைய மருத்துவ ஊழியர்கள் மீதோ, மருத்துவமனை மீதோ எந்த நிலையிலும் வைக்க மாட்டேன். இதையே என்னுடைய ஒப்புதல் மற்றும் வேண்டுகோள் கடிதமாக ஏற்றுக்கொள்ளுமாறு கேட்டுக்கொள்கிறேன்.

நோயாளியின் கையொப்பம்

சிறுநீரக குழாய்களில் அடைப்பு ஏற்படாமலிருக்க அறுவை சிகிச்சையின் ஒரு பகுதியாக ஸ்டேன்ட் பொருத்தும் போதும் ஏற்படும் பக்க விளைவுகளை டாம்சுலோசின் என்ற மருந்தினால் குறைக்க முடியும்.

நோயாளியின் ஒப்புதல் படிவம்

ஆராய்ச்சி நிலையம் : அரசு ஸ்டான்லி மருத்துவமனை, சென்னை 600001

பங்கு பெறுபவரின் பெயர் :

பங்கு பெறுபவரின் கையொப்பம் :

பங்கு பெறுபவர் இதனை ( ) குறிக்கவும்

மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது. என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டது .	
நான் இந்த ஆய்வில் தன்னிச்சையாகத்தான் பங்குபெருகிரேன் .எந்த காரணத்தினாலோ எந்த சட்டசிக்கல்களுக்கும் உட்படாமல் நான் இந்த ஆய்வில் இருந்து விலகிக்கொள்ளலாம் என்று அறிந்து கொண்டேன்.	
இந்த ஆய்வு சம்பந்தமாகவோ, இதை சார்ந்த மேலும் ஆய்வு மேற் கொள்ளும் போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்துகொள்கிறேன்.நான் ஆய்வில் இருந்து விலகிக்கிகொண்டாலும் இது பொருந்தும் என அறிந்தேன்.	
இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும் , பரிசோதனை முடிவுகளையும், மற்றும் சிகிச்சை தொடர்பான தகவல்களையும் மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயன்படுத்திக்கொள்ளவும் அதை பிரசுரிக்கவும் என் முழு மனதுடன் சம்மதிக்கிறேன்.	
இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக்கொள்கிறேன். எனக்கு கொடுக்கப்பட அறிவுரைகளின் படி நடந்து கொள்வதுடன் இந்த ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்றும் உறுதி அளிகின்றேன். என் உடல் நலம் பாதிக்கப்பட்டாலோ அல்லது எதிர்பாராத, வழக்திர்க்குமாறன நோய்க்குறி தென்பட்டாலோ உடனே அதை மருத்துவ அணிக்கு தெருவிப்பேன் என உறுதி அளிக்கிறேன்.	
இந்த ஆய்வில் எனக்கு ரத்தம், சிறுநீர், எக்ஸ்ரே, ஸ்கேன், உட்பட அனைத்து பரிசோதனைகளையும் செய்து கொள்ள நான் முழு மனதுடன் சம்மதிக்கிறேன்.	

பங்கேற்பவரின் கையொப்பம்..... .....இடம்.....தேதி .....

கட்டைவிரல் ரேகை.....

பங்கேற்பவரின் பெயர் மற்றும் விலாசம் .....
.....

ஆய்வாளரின் கையொப்பம்..... ..இடம்..... தேதி.....

ஆய்வாளரின் பெயர் .....

S. No	Patient Name	Gender	Age	Patient IPOP No	Provisional Diagnosis	BASELINE					AT STENT REMOVAL				
						TOTAL IPSS SCORE	Irritative symptom score	Obstructive symptom score	Visual analog pain scale	Quality of life	TOTAL IPSS SCORE	Irritative symptom score	Obstructive symptom score	Visual analog pain scale	Quality of life
1	Kali	Male	41	1406087	Lt VUJ Calculi	11	5	6	5	3	15	10	5	7	3
2	Manoharan	Male	44	1406507	LT LOWER URETERIC CALCULUS	9	4	5	4	2	14	9	5	6	3
3	Pandian	Male	47	1405753	Rt lower uretric calculus	7	3	4	3	2	13	9	4	6	3
4	Saravanan	Male	16	1405320	Lt vuj calculus	8	3	5	3	2	12	8	4	5	3
5	Jayakumar	Male	18	1404059	RT VUJ CALCULUS WITH HUN	6	2	4	4	3	10	6	4	5	3
6	Panjalai	Female	48	1404097	LT HUN WITH VUJ CALCULUS	11	5	6	4	3	16	11	5	7	4
7	Selvi	Female	58	1401223	LT MID URETERIC CALCULUS	6	3	3	4	3	12	8	4	6	3
8	Bhavani	Female	27	1400904	LT vuj calculus	8	3	5	3	2	13	8	5	6	3
9	Dhatchayani	Female	44	1400917	LT LOWER uretric calculus	9	4	5	5	3	14	9	5	6	4
10	Anbu Selvi	Female	45	54412	Rt UPPER uretric calculi with hun	11	5	6	5	3	18	11	7	6	5
11	Babu	Male	37	54011	Lt VUJ calculi	5	2	3	3	3	11	7	4	5	3
12	Sumathy	Female	36	52831	Lt LOWER ureteric calculi	10	4	6	5	3	16	11	5	6	4

13	Lakshmi	Female	37	51130	Rt upper uretric calculi	5	2	3	3	2	10	7	3	5	3
14	Sasikumar	Male	23	50628	Rt VUJ calculi	8	3	5	4	2	14	9	5	6	3
15	Stephen Raj	Male	23	50024	Rt vuj calculi	7	3	4	4	3	12	8	4	5	4
16	Malathy	Female	17	50129	LT LOWER URETRIC CALCULI	5	2	3	5	4	10	6	4	4	2
17	Selvakumar	Male	34	49236	Rt LOWER uretric calculi	6	3	3	4	3	12	8	4	5	3
18	Duraisamy	Male	37	48908	Rt vuj calculi	8	4	4	3	3	13	8	5	5	3
19	Jamrath Banu (a) Banu	Female	48	47537	Rt UPPER uretric calculi	12	5	7	6	2	16	11	5	6	5
20	Suresh (a) Suresh Kumar	Male	34	47469	Rt lower uretric calculi	5	2	3	3	3	11	6	5	5	3
21	Vinoth	Male	24	46599	LT VUJ CALCULUS	5	3	2	5	4	12	6	6	5	3
22	Kumar (A) Prakash kumar	Male	35	44532	Rt MID uretric calculus with hun	7	3	4	4	3	13	9	4	5	3
23	Ranganagayi	Female	60	45090	RT LOWER URETRIC CALCULLI	11	5	6	6	4	15	10	5	6	4
24	Rajendran	Male	52	43560	Rt LOWER uretric calculi	5	3	2	4	3	11	7	4	5	3
25	Jamuna	Female	38	43589	Lt lower uretric calculus lt hun	9	4	5	4	3	14	9	5	6	4

26	Sugirtharaj	Male	52	43410	Rt vuj calculi	8	3	5	3	3	16	11	5	7	5
27	Janakiraman	Male	45	43073	Lt UPPER uretric calculi with hun	6	3	3	4	2	11	6	5	5	3
28	Babu	Male	43	42680	Lt vuj calculi	9	3	6	4	4	14	10	4	6	4
29	Balasundaram	Male	57	40997	Lt UPPER uretric calculi	10	4	6	5	4	16	11	5	7	4
30	Shakila	Female	42	40358	LT UPPER URETRIC CALCULI	7	3	4	4	3	13	9	4	5	3
31	Ganesan	Male	45	30415	Lt LOWER uretric calculi/hun	12	5	7	6	4	16	10	6	6	5
32	Madhan	Male	24	38156	Rt vuj calculi	9	5	4	4	2	13	9	4	5	4
33	Umapathy	Male	48	37342	LT UPPER uretric calculi	11	4	7	5	4	15	10	5	6	5
34	Palayam	Male	38	37176	Lt mid uretric calculi	10	4	6	6	3	16	11	5	6	4
35	Vijayakumar	Male	32	37756	Rt vuj calculi	6	3	3	4	2	12	8	4	5	3
36	Vennila	Female	30	36647	Rt hun with upper uretri calculi	9	4	5	3	2	16	10	6	6	4
37	Sukumari	Female	27	35656	Lt mid uretric calculi with hun	7	3	4	3	3	12	8	4	5	3
38	Selvarani	Female	30	33097	RT LOWER URETRIC CALCULUS	5	2	3	4	2	10	6	4	5	2
39	Sathya	Female	20	32072	Lt lower uretric calculi	5	3	2	3	3	14	10	4	5	4

40	Mayakrishanan	Male	55	29203	Rt vuj calculi	9	4	5	5	2	13	9	4	5	3
41	Krishnaveni	Female	21	30352	Lt vuj calculi	6	3	3	5	3	17	12	5	7	4
42	Rajesh	Male	30	27960	LT HUN WITH VUJ CALCULUS	7	2	5	4	3	11	7	4	5	3
43	Jayakumar	Male	19	28374	Lt lower uretric calculi	5	2	3	5	2	9	5	4	4	2
44	Rajiv Gandhi	Male	26	28790	Rt UPPER uretric calculi with hun	6	3	3	4	2	13	9	4	5	3
45	Umamaheshwari	Female	28	28381	LT HUN UPPER URETRIC CALCULI	6	2	4	3	2	11	7	4	4	3
46	Govindaraj	Male	60	27788	Lt hun upper uretric calculus	8	3	5	4	3	14	9	5	6	3
47	Unna Malai	Female	50	10/13/1932	RT LOWER URETRIC CALCULI	11	4	7	7	4	17	12	5	7	5
48	Dhanalakshmi	Female	38	26153	Rt hun upper uretric calculus	9	4	5	5	4	15	10	5	6	3
49	Babu	Male	40	25864	Rt upper uretric calculi	7	3	4	3	4	13	9	4	5	3
50	Babu	Male	24	25226	Lt vuj calculus	6	3	3	2	3	12	8	4	4	3
51	James	Male	28	25059	Lt vuj calculi	11	4	7	5	4	16	11	5	6	5
52	LIVENGSTON	Male	44	22689	Rt mid uretric calculi	8	4	4	3	3	13	9	4	5	3

53	Prabha	Female	23	21481	Rt upper uretric calculi	8	3	5	3	2	14	9	5	5	4
54	Saroja	Female	55	24186	Rt vuj calculi	9	4	5	6	3	16	11	5	7	4
55	KALIL	Male	32	21866	LT UPPER URETRIC CALCULI	7	2	5	4	3	13	9	4	5	3
56	MANI	Male	40	22254	Rt mid uretric calculus	11	5	6	6	4	17	12	5	7	5
57	Datchayani	Female	25	21858	Rt UPPER calculi	8	4	4	3	3	14	9	5	5	3
58	Deivanai	Female	35	21732	Lt lower uretric calculi	12	5	7	6	3	16	9	7	7	5
59	ANANDHAN	Male	45	21859	LT upper uretric calculi	8	3	5	4	2	13	7	7	7	3
60	JOHNPAUL	Male	23	21875	Lt mid uretric calculi	5	2	3	4	3	9	5	4	4	2
61	Tamilarasu	Male	32	21851	LT MID URETRIC CALCULI HUN	11	5	6	6	3	18	12	6	8	5
62	Kumar	Male	34	20663	Lt mid uretric calculus	6	3	3	5	3	10	6	4	5	2
63	MANI	Male	50	18912	RT mid CALCULI/HU N	5	2	3	4	3	13	8	5	6	3
64	Anjalai	Female	45	19964	RT MID URETRIC CALCULI	7	3	4	3	2	12	8	4	5	3
65	Geetha	Female	28	17745	Lt upper uretric calculus	8	4	4	5	3	14	9	5	7	4

66	AKBAR BASHA	Male	49	19979	Lt MID uretric calculus	11	5	6	6	4	15	10	5	6	4
67	Kurshid Begam	Female	28	19566	Lt upper uretric calculus/HUN	6	2	4	5	2	10	6	4	6	3
68	Poiyathu	Male	41	19575	RT UPPER URETRIC CALCULI	9	3	6	4	3	14	9	5	6	4
69	Suresh	Male	29	18930	Lt lower uretric calculus	7	3	4	5	3	13	9	4	5	3
70	Ravi	Male	47	18470	Lt vuj calculus	11	6	5	6	4	17	12	5	7	4
71	Murugesan	Male	37	18472	LT LOWER URETRIC CALCULUS	6	3	3	5	3	11	6	4	6	3
72	Ilayamurugan	Male	37	17009	Lt upper uretric calculus / hun	4	2	2	4	3	10	6	4	5	3
73	ELUMALAI	Male	31	15792	Rt VUJ CALCULUS	5	2	3	5	2	11	7	4	4	2
74	Abdul Wahid	Male	62	13809	LT VUJ CALCULUS WITH HUN	8	3	5	3	3	13	9	4	6	3
75	Sumathy	Female	36	15087	Rt VUJ CALCULI WITH HUN	7	3	4	3	2	14	10	4	6	3
76	Balaji	Male	26	14088	RT UPPER URETRIC CALCULUS	5	3	2	4	3	11	7	4	4	3
77	Tharunesh	Male	13	13588	Rt VUJ CALCULI WITH HUN	4	2	2	3	3	10	6	4	5	2

78	Shankari	female	10	13694	RT UPPER URETRIC CALCULUS	6	2	4	4	3	13	9	4	5	3
79	Murthy	Male	30	13501	RT UPPER URETRIC CALCULUS HUN	5	2	3	3	2	14	10	4	7	4
80	Anjali	Female	47	13459	Rt lower uretric calculi	10	4	6	5	4	14	10	4	6	3
81	David	Male	33	11318	LT VUJ CALCULUS WITH HUN	6	3	3	4	3	13	9	4	6	3
82	Indian	Male	14	11449	Lt VUJ Calculi	9	5	4	6	3	14	10	4	6	4
83	Ameena (A) Sumeena	Male	24	9799	RT lower uretric calculus	7	3	4	4	2	13	9	4	5	3
84	Nirmala	Female	35	8800	Rt upper uretric calculus HUN	10	4	6	5	4	15	10	5	7	4
85	Pursothaman	Male	32	8827	Rt VUJ CALCULI	7	3	4	3	2	16	11	5	7	5
86	Rajasekar	Male	27	8284	Lt VUJ calculus	8	4	4	4	3	14	10	4	7	4
87	Senthil	Male	26	6034	Rt HUN/ lower uretric calculus	5	2	3	3	3	13	9	4	6	3
88	Vijaya Kumar	Male	26	5683	Lt VUJ calculi	6	3	3	4	2	12	8	4	4	3
89	Mohana Valli	Female	56	3944	RT LOWER URETRIC CALCULI	11	4	7	5	3	15	11	4	6	4
90	Annamalai	Male	39	4244	Lt VUJ calculi	6	3	3	4	3	14	10	4	7	3

Sl. No	Patient Name	Gender	Patient Age	Patient IPOP No	Provisional Diagnosis	BASELINE					AT STENT REMOVAL				
						TOTAL IPSS SCORE	Irritative symptom score	Obstruct-ive symptom score	Visual analog pain scale	Quality of life	TOTAL IPSS SCORE	Irritative symptom score	Obstruct-ive symptom score	Visual analog pain scale	Quality of life
1	Venkatesan	Male	28	1406889	Rt upper uretric calculus with hun	8	4	4	4	3	5	2	3	3	3
2	Pavithra	Female	48	1402875	Rt lower uretric calculus	7	3	4	4	2	5	2	3	3	2
3	Mahesh	Male	28	1405748	Lt LOWER uretric calculus	9	4	5	5	3	5	2	3	4	2
4	Bhuvaneshwari	Female	42	1404087	Rt UPPER ureteric calculus	10	5	5	6	3	5	2	3	5	2
5	Saravanan	Male	28	1404760	Rt vuj calculus	13	8	5	6	4	5	3	2	4	2
6	Rahamath Nisha	Female	38	1404066	Lt LOWER uretric calculus	9	4	5	5	3	6	2	4	4	1
7	Raja	Male	41	1403479	Rt MID uretric calculus	6	3	3	3	3	5	2	3	3	3
8	Karthik	male	21	1402440	Lt lower uretric calculus with HUN	7	3	4	3	3	6	2	4	3	1
9	Dhinakaran	Male	27	55586	It upper ureteric calculi	10	5	5	6	4	5	2	3	4	2
10	Anandhi	Female	53	51464	RT upper URETRIC CALCULI	9	4	5	5	3	6	2	4	4	2
11	Sargunam	Female	24	53419	Lt upper ureteric calculi	5	3	2	3	2	5	2	3	3	2
12	Mohana Sundari	Female	34	51546	RT LOWER URETRIC CALCULI	7	3	4	4	3	6	3	3	4	3
13	Tamilarasu	Male	27	51110	LT hun with lower uretric calculi	9	5	4	5	3	6	2	4	4	2
14	Muthusamy	Male	55	45240	RT upper uretric calculus	7	3	4	4	3	5	2	3	3	3
15	Munusamy	Male	45	50582	Rt LOWER uretric calculi with hun	8	4	4	4	3	6	2	4	3	1
16	Padma	Female	64	49213	Lt lower uretric calculi/ hun	5	3	2	3	2	5	2	3	2	2

17	Palayam	Male	60	49217	Lt LOWER uretreic calculi	7	3	4	3	3	6	2	4	2	3
18	Mohammed Ali jinna (a) Jinna	Male	36	48236	Lt upper ureteric calculi	6	3	3	3	3	6	3	3	3	2
19	Sundar (A) Sundar periyanayagaraj	Male	34	47586	Rt MID uretric calculi	8	4	4	3	3	5	2	3	2	3
20	Annamalai	Male	54	46704	RT LOWER URETRIC CALCULI	11	5	6	5	4	5	3	2	3	1
21	Samundeeswari	Female	32	46613	LT VUJ CALCULUS	6	3	3	2	2	6	2	4	2	1
22	Sneha (a) Sneha Jenifer	Female	17	45103	RT VUJ CALCULI	9	4	5	5	3	6	3	3	3	2
23	Munusamy	Male	29	44578	Rt hun LOWER uretri calculi	8	3	5	5	3	7	2	5	4	2
24	Jayakumar	Male	19	41180	Rt LOWER uretric calculi	7	3	4	4	3	6	2	4	3	3
25	Sarala	Female	34	41367	Lt UPPER uretric calculi / hun	8	4	4	3	3	5	2	3	3	1
26	Anandan	Male	36	42673	Lt vuj calculus WITH HUN	11	5	6	7	4	5	3	2	5	2
27	Arumugam	Male	46	42711	Lt vuj calculi hydronephrosis	6	3	3	3	2	4	2	2	2	2
28	Sami Durai	Male	24	41409	Lt uretric calculi	7	3	4	3	3	5	2	3	2	2
29	Elumalai	Male	43	40991	RT UPPER URETER CALCULUS	9	4	5	5	3	6	3	3	4	1
30	Karpagam	Female	34	39739	Lt LOWER uretric calculi	7	3	4	5	3	4	2	2	3	3
31	Vennila	Female	45	38771	Lt mid uretric calculi with hun	6	2	4	3	3	5	2	3	2	1
32	Boopalan	Male	33	37575	Rt lower uretric calculi	9	5	4	5	3	6	2	4	4	2
33	Nirmala Bai	Female	48	37352	RT VUJ CALCULUS	9	4	5	4	3	6	3	3	3	1
34	Subramani	Male	38	37056	Lt upper uretric calculi	8	3	5	3	3	5	2	3	3	2
35	Kamalakannan	Male	33	37024	Lt mid uretric calculi	9	4	5	4	3	4	2	2	3	1

36	Malliga	Female	55	35856	Rt LOWER uretric calculi	8	3	5	4	2	4	2	2	2	2
37	Pachiammal	Female	27	33832	Lt UPPER uretric calculi / hun	7	3	4	3	2	6	4	2	2	1
38	Sundarakumar (a) Chandra Kumar	Male	41	33092	Rt lower uretric calculus	7	3	4	4	2	5	2	3	3	2
39	Revathy	Female	52	31020	Lt lower uretric calculi	6	2	4	2	2	5	2	3	2	2
40	Manikandan	Male	31	35061	Rt vuj calculi	9	4	5	4	3	4	2	2	2	3
41	Raman	Male	53	27972	Lt vuj calculi/ hun	10	5	5	6	4	5	3	2	4	2
42	Surya	Male	13	28577	RT LOWER hun	7	3	4	4	3	6	3	3	3	3
43	Kamaljee	Male	24	28018	LT vuj calculi	6	2	4	4	3	5	2	3	3	1
44	Ambika	Female	34	28578	RT VUJ CALCULUS	9	3	6	5	3	6	3	3	4	2
45	Deepa	Female	28	2874	Lt HUN upper uretric calculus	7	3	4	4	3	5	2	3	3	2
46	Nagalingam	Male	31	27409	Lt vuj calculi	8	4	4	3	4	5	3	2	3	3
47	Gowri	Female	30	26930	Rt lower uretric calculus	9	4	5	5	3	5	2	3	4	1
48	Rajamani	Male	27	26358	Lt Hun/ uppper uretric calculi	9	3	6	4	3	4	2	2	3	2
49	Kannan	Male	49	25110	Lt hun/mid uretric calculus	7	2	5	4	3	6	3	3	3	2
50	Valarmathi	Female	37	240808	Rt vuj calculi	5	2	3	2	2	5	2	3	2	1
51	Padma	Female	40	23006	Rt vuj calculi	9	3	6	5	3	6	2	4	3	3
52	Suresh	Male	28	22708	LT UPPER URETERIC CALCULI	7	3	4	4	3	6	3	3	3	3
53	Ragini	Female	30	23448	LT UPPER URETRIC CALCULUS	8	3	5	5	4	5	2	3	3	1
54	Senthilkumar	Male	32	21558	Rt VUJ CALCULI	10	5	5	6	4	5	3	2	4	3
55	Padmanaban	male	44	22931	Rt lower uretric calculus	7	3	4	4	3	5	2	3	3	2
56	Ellaiyan	Male	38	22746	Rt upper uretric calculi	9	4	5	5	3	5	3	2	3	2
57	Thangavel	Male	60	21727	Lt upper uretric calculi	8	4	4	4	2	6	2	4	3	1

58	Ramya	Female	18	22317	Rt lower uretric calculi	6	3	3	3	3	5	2	3	3	3
59	SARAVANAN	Male	40	21872	Lt mid uretric calcali	9	4	5	5	3	5	3	2	3	2
60	Chitra	Female	24	21711	Rt mid uretric calculi	5	3	2	4	2	5	2	3	2	2
61	Rajeshwari	Female	45	21563	RT UPPER URETRIC CALCULUS	7	3	4	3	4	5	3	2	2	1
62	Tamil Selvan	male	35	20886	RT VUJ CALCULI	9	4	5	5	4	5	2	3	3	3
63	Muthulakshmi	Female	36	20010	LT UPPER URETRIC CALCULUS	8	3	5	4	3	6	3	3	3	2
64	Akbar Ali	Male	36	20008	Lt upper uretric calculus	7	3	4	4	2	4	2	2	4	2
65	Sumathi	Female	39	20001	Rt VUJ CALCULI	8	3	5	4	3	5	2	3	3	3
66	Menaga	Female	35	19262	LT HUN VUJ CALCULUS	9	3	6	5	3	5	2	3	3	1
67	Sangamma	Male	37	19568	RT HUN MID URETRIC CALCULUS	11	4	7	6	4	5	3	2	4	2
68	Mohan	Male	23	19216	Rt VUJ CALCULUS/HUN	8	3	5	5	3	5	2	3	4	3
69	Rafiq	Male	29	18319	LT mid urethra calculus	7	3	4	4	3	5	3	2	3	3
70	Suresh	Male	37	17786	LT MID URETRIC CALCULUS	12	5	7	6	4	4	2	2	3	2
71	Govindaraj	Male	31	18422	Rt upper uretric calculus /HUN	6	2	4	5	4	5	2	3	3	1
72	Ayyanar	Male	25	15293	Rt VUJ CALCULUS	7	3	4	4	3	4	2	2	2	3
73	Kumar	Male	45	15975	Rt LOWER uretric calculus	5	2	3	3	3	5	3	2	2	1
74	Ramesh	Male	28	15133	RT hun with upper uretric calculus	7	3	4	5	2	6	3	3	3	2
75	Kanagaman	Female	48	15481	LT HUN VUJ CALCULUS	7	3	4	4	4	5	2	3	3	3
76	Kalai Selvi	Female	43	14588	RT VUJ CALCULUS/HUN	6	2	4	4	3	4	2	2	3	2
77	Selva	male	40	13644	Rt lower uretric calculi	6	3	3	5	3	4	2	2	3	2
78	Chandar (A) Sundar	Male	29	13038	Rt Lower uretric calculus	6	2	4	5	3	5	2	3	3	3

79	Rajan(A) Rasamuthu	Male	21	13021	Lt lower uretric calculus with HUN	11	5	6	6	4	5	3	2	4	2
80	Manimegalai	Female	38	13072	Lt lower uretric calculi	7	3	4	4	4	5	2	3	3	3
81	Raja Sekar	Male	41	11450	Rt upper uretric calculi	6	3	3	5	3	5	3	2	4	2
82	Kamala	Female	56	11453	RT LOWER URETRIC CALCALUS	11	5	6	6	4	4	2	2	4	3
83	Velayutham	Male	57	9384	Lt VUJ CALCULI	7	3	4	5	3	5	3	2	3	3
84	Tamim Ansar	Male	27	9250	Rt VUJ CALCULI WITH RT HUN	7	3	4	3	3	5	2	3	3	2
85	Poppy Mary	Female	43	7182	RT VUJ CALCULUS	11	5	6	6	4	5	3	2	4	2
86	Kamala	Female	35	7082	Rt upper urectric calculi	9	4	5	4	3	5	3	2	3	3
87	Vasudevan	Male	38	5659	LT UPPER URETRIC CALCULI	5	2	3	4	3	4	2	2	3	1
88	Mathi	Male	47	4959	Lt VUJ Calculi	10	5	5	6	3	5	2	3	3	3
89	Sulochana	Female	35	3919	Rt VUJ CALUCULI	12	5	7	6	4	5	3	2	3	2
90	Jothi	female	33	3786	Lt lower uretric calculi	8	3	5	4	3	4	2	2	3	3

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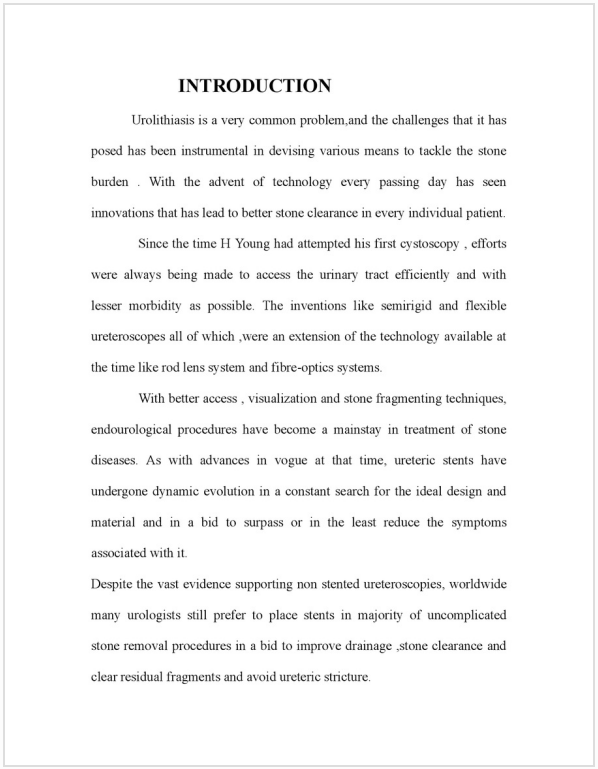

INTRODUCTION

Urolithiasis is a very common problem,and the challenges that it has posed has been instrumental in devising various means to tackle the stone burden . With the advent of technology every passing day has seen innovations that has lead to better stone clearance in every individual patient.

Since the time H Young had attempted his first cystoscopy , efforts were always being made to access the urinary tract efficiently and with lesser morbidity as possible. The inventions like semirigid and flexible ureteroscopes all of which ,were an extension of the technology available at the time like rod lens system and fibre-optics systems.

With better access , visualization and stone fragmenting techniques, endourological procedures have become a mainstay in treatment of stone diseases. As with advances in vogue at that time, ureteric stents have undergone dynamic evolution in a constant search for the ideal design and material and in a bid to surpass or in the least reduce the symptoms associated with it.

Despite the vast evidence supporting non stented ureteroscopies, worldwide many urologists still prefer to place stents in majority of uncomplicated stone removal procedures in a bid to improve drainage ,stone clearance and clear residual fragments and avoid ureteric stricture.