Intraurethral Steroid Injection Following Visual Internal Uerthrotomy in the Management of Anterior Urethral Strictures

Thesis

Submitted For Partial Fulfillment Of Master Degree In Urology

By

Adel Girgis Rasmy
M.B., B.Ch. -Ain Shams University

Supervision of

Prof. Dr. Hany Mostafa Abdallah
Professor of Urology
Faculty of Medicine - Ain Shams University

Dr. Mohamed Abu El Naga
Lecturer of Urology
Faculty of Medicine - Ain Shams University

Faculty of Medicine
Ain Shams University
2019

Acknowledgment

First and foremost, I feel always indebted to **ALLAH**, *the Most Kind and Most Merciful.*

I'd like to express my respectful thanks and profound gratitude to **Prof. Dr. Hany Mostafa Abdallah,** *Professor of Urology Faculty of Medicine - Ain Shams University for his keen guidance, kind supervision, valuable advice and continuous encouragement, which made possible the completion of this work.*

I am also delighted to express my deepest gratitude and thanks to **Dr. Mohamed Abu El Naga,** *Lecturer of Urology Faculty of Medicine - Ain Shams University, for his kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.*

I would like to express my everlasting gratitude to **national institute of Urology & Nephrology and all it's member**, *so many of them influenced, encouraged and inspired me throughout the years. I wish them the best of all.*

I would like also to thank the **Patients** *who agreed willingly to be part of my study and without them; I would not have been able to accomplish this work.*

Adel Girgis Rasmy

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List of Abbreviations

Abb.	Full term
AUA-SI	American Urological Association Symptom Index
BIPIPS	Bilaterally pedicled island penile skin
BPH	Benign prostatic hyperplasia
BXO	Balanitis xerotica obliterans
CFF	Penile circular fasciocutaneous flap
CT	Computed Tomography
CTCUG	CT cystourethrography
IPSS	International Prostate Symptom Score
ISD	Intermittent self-Dilation
IU	Internal urethrotomy
LUTS	Lower urinary tract symptoms
MRI	Magnetic Resonance Imaging
RUG	Retrograde urethrography
SU	Sonourptrography
UTI	Urinary tract infections
VCUG	Voiding cystourethrography
VIU	Visual internal urethrotomy

INTRODUCTION

Urethral stricture is a narrowing of the urethral lumen caused by scarring. The corpus spongiosum in which the urethra is embedded is also involved in scarring. This spongiofibrosis is a reaction to various extrinsic irritants and can lead to complete replacement of the spongy tissue by scar tissue ***(Tritschler et al., 2013).***

The leading cause of urethral strictures is infection but with development of mankind and technologies, iatrogenic instrumentations and external trauma take the lead ***(Yıldırım et al., 2016).***

The actual incidence of urethral strictures developed after the transurethral resection of the prostate is 2-10%, as well as radical (8.4%) and simple (1.9%) prostatectomies ***(Yıldırım et al., 2016).***

Stricture can develop in any part of the urethra from the prostatic urethra to the meatus ***(Tabassi et al., 2011).***

Men with symptomatic stricture disease will typically present with obstructive voiding symptoms such as straining, incomplete emptying, and a weak stream; they might also have a history of recurrent UTI, prostatitis, epididymitis, haematuria, or bladder stones ***(Hampson et al., 2014).***

All patients should have a complete history and physical examination and urine analysis at a minimum. Decreased urinary stream, incomplete emptying and other findings such as urinary tract infection are manifestations of urethral stricture. In the initial assessment of patients suspected of having a urethral strictureis is to assess symptoms, uroflowmetry to determine severity of obstruction, and ultrasound post-void residual volume to identify urinary retention may be used. Patients with symptomatic urethral stricture typically have a reduced peak flow rate ***(Wessells et al., 2017).***

Confirmation of a urethral stricture diagnosis is made with urethroscopy, retrograde urethrography, or ultrasound urethrography. Urethroscopy readily identifies a urethral stricture, but does not delineate the location and length of strictures. Retrograde urethrography (RUG) with voiding cystourethrography (VCUG) allows for identification of stricture location in the urethra, length of the stricture, and degree of lumen narrowing. All of these stricture characteristics are important for subsequent treatment planning ***(Wessells et al., 2017).***

Before any attempt for treatment both physician and patient must arrive at a common understanding in relation to their expectations of treatment outcomes. The presence of comorbidities or personal preference might lead some patients to choose symptomatic management of their stricture disease (by periodic dilation and internal urethrotomy) over potentially curative procedures, such as urethroplasty ***(Tonkin and Jordan, 2009).***

Urethral dilation; the goal of dilatation is to gently stretch the scar tissue, thereby expanding the urethral lumen, without tearing it or causing further trauma. This aim might be best accomplished by repeated soft dilatation techniques. Soft catheters or balloon dilators are often best suited to this method of treatment. Ideally, the intervals between treatments should be lengthy to reduce the patient's discomfort and avoid repeated trauma that might contribute to disease progression ***(Tonkin and Jordan, 2009).***

Urethral dilatation has been also performed with rigid dilator such as Van Buren and Beniquet dilators or other metal or filiform devices and dilators. This modality is used for treating localized and post-urethroplasty urethral strictures ***(Akkoc et al., 2016).***

Urethroplasty is the only curative option currently available for the treatment of recurrent bulbar strictures and for all other anterior urethral strictures.Short strictures of the bulbar urethra may be amenable to excision and end-to-end anastomosis, with or without augmentation.Longer strictures of the bulbar urethra are best treated by a stricturotomy and patch procedure, using a buccal mucosal graft in most circumstances or skin flap in others.Penile strictures of any length require a substitution urethroplasty in one or two stages depending on the length and the

nature and severity of the underlying problem and the effects of previous surgery ***(Mundy and Andrish, 2011).***

Intermittent self-Dilation (ISD); is a therapy used to reduce the risk of urethral strictures from recurring. This procedure of self –dilation can be carried out at home ***(Lauritzen et al., 2009).***

In clinical practice, internal urethrotomy is an easy procedure and is offered as a first modality for treatment of short urethral strictures. Internal urethrotomy refers to any procedure that opens the stricture by incising or ablating it transurethrally. The most common complication of internal urethrotomy is stricture recurrence. The curative success rate of internal urethrotomy is approximately 20 % ***(Mazdak et al., 2009).***

The length of follow –up is very important when assessing the success of IU and the rate of stricture recurrence. Most reports show that if recurrence occurs it is most likely to do so within 3-12 months and if there was no recurrence by the 3 months after the first IU, 60% of patients would remain stricture –free at 48 months. If recurrence occurred at 3 months and a second IU was performed, there was virtually no chance of the patient to be stricture free at 48 months. But if recurrence occurred > 6 months after first IU, there was a 40% chance of long –term cure with a second IU ***(Naudé and Heyns, 2005).***

Several adjuvant interventions have been proposed to minimize the recurrence rate of urethral strictures after internal urethrotomy one of them is local intraurethral corticosteroid injection (prednisone) after internal urethrotomy which decrease the recurrence rate. Corticosteroids decrease the scar formation by reducing collagen and glycosaminoglycans synthesis and expression of inflammatory mediators ***(Tabassi et al., 2011).***

AIM OF THE WORK

This study aims to evaluate the effect of local intraurethral injection of steroid in treatment of urethral stricture after visual urethrotomy.

Chapter 1

ANATOMY OF THE MALE URETHRA

The adult male urethra is a tubular conduit, approximately 18–20 cm long, extending from the bladder neck to the external opening, or meatus, at the tip of the penis. At the level of the perineal membrane, it is divided into two parts: the posterior urethra and the anterior urethra (figure 1) ***(Jorgensen et al., 1986).***

I) Anterior urethra: (about 16 cm) is completely surrounded by the corpus spongiosum.It lies proximally in the perineum and distally in the penis. It is further divided into three segments

1. ***The fossa navicularis*** is contained within the spongy erectile tissue of the glans penis and terminates at the junction of the urethral epithelium with the skin of the glans. This portion of the urethra is lined with stratified squamous epithelium ***(Jordan and Schlossberg, 2002).***

2. The penile (pendulous) urethra extends from the glans to the level of the penoscrotal junction. It lies distal to the investment of the ischiocavernosus musculature but it invested by the corpus spongiosum and maintains a constant lumen size roughly centered in the corpus spongiosum. The pendulous