Definition of Successful Treatment and Optimal Follow-up after Urethral Reconstruction for Urethral Stricture Disease

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KEYWORDS

• Urethroplasty • Urethral stricture • Stricture recurrence • Urethroplasty success
• Urethroplasty follow-up

KEY POINTS

- The traditional academic definition of a successful urethroplasty, lack of need for a secondary procedure, is outdated and should be amended to incorporate both objective (anatomic) and subjective (functional) outcomes measures.
- Anatomic success is assigned if a flexible cystoscope is able to traverse the reconstructed urethra without force during postoperative cystoscopy.
- Functional success is assigned if analysis of patient-reported outcome measures (PROMs) reveals improvement in voiding symptoms and urinary quality of life, without de novo sexual dysfunction or genitourinary pain.
- The optimal follow-up strategy must allow for determination of both anatomic and functional outcomes, protect patients' genitourinary health, and prevent patients from undergoing excessive invasive testing that leads to unnecessary cost, discomfort, anxiety, and risk.
- Objective uroflowmetry combined with PROMs and/or an obstructive voiding curve has high sensitivity and specificity for detecting recurrences and can be used as a surrogate for anatomic evaluation over time.

INTRODUCTION

Background

Male urethral stricture disease (USD) has an estimated prevalence of 0.6%.[1] The most typical way men present with USD is with obstructive voiding symptoms (eg, slow urinary flow).[2] However, up to 10% of patients will present without a history of bothersome symptoms and may only be diagnosed after a difficult urethral catheterization or during evaluation of recurrent urinary tract infections or urinary retention. USD can affect any part of the male urethra but most frequently affects the bulbar (43%) and penile (37%) segments.[3]

Treatment approaches for USD range from minimally invasive endoscopic techniques (eg, urethral dilation, direct visual internal urethrotomy) to open urethral reconstruction, which often uses local fasciocutaneous flaps and/or autologous tissue

Disclosure Statement: The above authors have nothing to disclose.
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Urol Clin N Am 44 (2017) 1–9
http://dx.doi.org/10.1016/j.ucl.2016.08.001
0094-0143/17/Published by Elsevier Inc.

grafts. Historical success rates for endoscopic management range from 0% to 50%,[4] with higher success rates being noted for shorter bulbar strictures that have not previously been managed surgically. Repeat endoscopic management is usually unsuccessful.[5] Open surgical techniques have significantly higher success rates, ranging from 50% to 98%,[3] with higher success rates generally being reported for shorter bulbar repairs that do not require flaps or grafts. Overall, success rates correlate well with the complexity of the repair.[6]

The most commonly performed treatments for USD continue to be endoscopic despite the lower reported success rates.[7] The apparent underuse of open urethral reconstruction in favor of endoscopic intervention is likely multifactorial, resulting from the relative simplicity of endoscopic techniques and the lack of familiarity and comfort with open techniques by many surgeons. Highlighting the educational deficits was a study by Bullock and Brandes,[7] which showed that, although 63% of urologists treated 6 to 20 urethral strictures in a given year, less than half of these urologists ever performed urethroplasty. In addition, side effects of urethroplasty, namely erectile dysfunction (ED) and urinary incontinence, are generally believed (falsely) to be more common than the literature supports, perhaps influencing both patient and provider enthusiasm for the procedures.[8]

Changing Practice Patterns for Urethral Stricture Disease

Attitudes about the treatment of USD seem to be changing, however, as demonstrated by a recently published article buy Liu and colleagues,[9] which showed a dramatic shift in the initial USD management over the past decade. The study revealed that, in 2004, urethroplasty was performed for USD only 2.3% of the time but, by 2012, the rate had increased to 7.6%. In addition, the years in practice seemed to be significantly associated with performance of urethroplasty, with newly certifying urologists being 3.7 times more likely to perform urethroplasty than their recertifying colleagues.[9] This change in attitudes is likely being spurred by a the rising number of Genitourinary Reconstructive Society fellowships in the United States,[10] more urethroplasties being performed in academic training centers, and the increase in academic interest in the field, particularly in outcomes of procedures that are performed to improve quality of life (ie, nononcologic surgeries).

Renewed academic interest in urethral reconstruction has forced the specialty to ask fundamental questions about the surgeries performed, the most basic of which is, "What constitutes a surgical success?" Traditionally, the academic definition of a successful urethroplasty has been defined as the lack of need for a secondary procedure. This definition is easily definable and, importantly, easy to quantitate using retrospective methodologies. However, the definition is also inherently subjective because it assumes that patient with recurrent symptoms will seek care at the center in which the urethroplasty was performed (ie, the patient did not go elsewhere for treatment); assumes equal utilization (both patient and provider) of secondary procedures for postoperative strictures; and, importantly, does not account for asymptomatic recurrences (ie, posturethroplasty decrease in urethral lumen size for which the patient does not have associated voiding symptoms), which have recently been shown to occur in up to 35% of recurrent strictures diagnosed by routine cystoscopy.[11]

Intimately associated with the question of how to define surgical success is the question "What is the best way to monitor the posturethroplasty patient?" With historical success rates being high and USD ultimately being a quality of life condition (ie, rarely does USD lead to mortality), excessive monitoring of the posturethroplasty patient is a legitimate concern because most urethroplasties will be ultimately be deemed successful. In addition, although academicians may be interested in topics such as postoperative urethral lumen size, most patients only care about their ability to empty their bladder in an appropriate and timely fashion. The ideal follow-up strategy must be able to account for both surgeon and patient concerns: maintaining the surgeon's ability to objectively define success (and failure) and protect patient's genitourinary health (ie, prevent bladder or renal dysfunction), all while preventing patients from undergoing unnecessary testing that leads to unnecessary cost, discomfort, anxiety, and risk.

Thus, the purpose of this article is 2-fold. This article reviews the literature for current definitions of surgical success and the current means by which the reconstructed urethra is monitored. It then proposes both a definition of success and a follow-up strategy that considers the concerns of both the patient and physician as previously listed.

DEFINING A SUCCESSFUL URETHROPLASTY

The basic goal of urethral reconstruction is to surgically construct a urethral lumen that is of large enough size (but not too large) to allow for the unimpeded flow of urine from the bladder through the urethra. Ultimately, the urethra provides little function other than acting as a conduit for socially