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<https://escholarship.org/uc/item/13p30701>

Journal

Archivos Españoles de Urología, 67(1)

ISSN

0004-0614

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Publication Date

2014

Peer reviewed

RE-OPERATIVE URETHROPLASTY, A SYSTEMATIC REVIEW

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Summary.- *OBJECTIVES:* Limited articles are published on re-operative urethroplasty outcomes. We sought to perform a systematic review of re-operative urethroplasty articles over the past fifteen years.

METHODS: A systematic review was performed on PubMed using the search terms "Urethra" AND "Surgical Procedures, Operative" OR "Urethroplasty".

RESULTS: Five articles out of 3,541 articles identified between 1998 and 2012 specifically addressed re-operative urethroplasty patients. A total of 212 patients were included in these five studies. Re-operative urethro-

plasty success rates ranged from 35% to 84%. Success rates were higher in the two studies with over 40 patients and ranged from 78-84%.

CONCLUSION: Limited studies address re-operative urethroplasty outcomes. Success rates for re-operation are lower than those for initial urethroplasty procedures. Overall, studies with a higher number of patients had an increased success rate.

Keywords: Urethroplasty. Re-operation. Systematic review.

Resumen.- *OBJETIVO:*



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Palabras clave: G

INTRODUCTION

Urethroplasty remains the gold standard for treatment of urethral stricture disease. Failures after urethroplasty can occur immediately to over a decade later (1). Failure after urethroplasty is defined differently in different studies, but ranges from need for reoperation to decline in uroflow to need for endoscopic intervention.

Literature on urethroplasty outcomes typically consists of case series with outcomes data. Many of these articles discuss prior failures after dilation and direct vision internal urethrotomy (2), but fewer articles address outcomes after re-operative urethroplasty procedures.

As the number of urethroplasty procedures performed by individual urologists and departments may be limited, writing about urethroplasty outcomes often groups together several types of patients into a single outcomes paper. Urethroplasty outcomes papers may include information on adults, children, anterior urethroplasty outcomes, posterior urethroplasty outcomes, patients with traumatic pelvic fractures, patients without any prior urethroplasty interventions, patients with endoscopic interventions only, and patients who have failed prior operative urethroplasty procedures. This makes analysis of urethroplasty outcomes data somewhat difficult because the information about the area of interest is often lumped together with data about patients not of interest.

Very few articles address outcomes from re-operative urethroplasty patients. We sought to evaluate and synthesize the existing information on re-operative urethroplasty outcomes by performing a systematic review from articles published over the past 15 years.

MATERIALS AND METHODS

A literature search was performed using the PubMed MeSH search terms "Urethra" AND "SurgicalProcedures,Operative" OR "Urethroplasty" on the PubMed database from 1998-2012. All articles were reviewed for inclusion of patients who had prior surgical urethroplasty procedures. As most patients who undergo urethroplasty had prior dilation and internal urethrotomy procedures, these patients were not included in the definition of patients undergoing re-operative urethroplasty. Papers with a limited number of re-operative urethroplasty patients included in a larger cohort analysis were excluded. Additionally, articles specifically addressing hypospadias repairs were

excluded from this analysis as hypospadias is a different etiology than urethral stricture disease.

In order to truly compare studies, we used standard criteria for urethroplasty success of requiring no more than a single endoscopic intervention with dilation or internal urethrotomy. Urethroplasty failure was defined as need for additional urethroplasty procedure or need for more than one endoscopic intervention.

RESULTS

Of 3,541 articles identified between 1998 and 2012, five specifically addressed re-operative urethroplasty patients. Four of these articles discussed posterior urethroplasty re-operative procedures (3-6), and one addressed anterior urethroplasty re-operations (1). Although the number of articles addressing re-operative urethroplasty procedures was limited, a greater number of articles addressed re-operative hypospadias (7-17). In the five articles identified that addressed re-operative urethroplasty patients, 212 total patients were included. All five articles are compared in Table 1.

Aggarwal et al reviewed outcomes from twelve pediatric posterior re-operative urethroplasty patients. They found a 75% success rate after reoperation following patients between six months and fifteen years. Two patients required repeat open operative intervention, and one required regular dilations. None of the failures occurred in patients who underwent anastomotic re-operative urethroplasty. All failures occurred in boys who underwent bowel substitution with the appendix or ileum (18).

Bhagat et al reported outcomes of 43 patients with urethral distraction defects. Two of these patients had anterior urethral injuries and 41 had posterior urethral injuries. Their success rate was 83.7% with a follow up of one to nine years. All of the seven patients who failed re-operative urethroplasty failed within the first year with most failures occurring within the first three months after re-operation (4).

In a series of 130 patients, by Blaschko et al, re-operative urethroplasty success rate was 79% with six month to 20.75 year follow up. On systematic review this was the largest series solely evaluating re-operative urethroplasty patients and the only series evaluating anterior urethroplasty re-operative patients. Risk factors for failure in this series included longer length of stricture, increased number of prior failed urethroplasty procedures, and urethral comorbidities such as hypospadias and lichen sclerosis. In prior

evaluation of urethroplasty outcomes in patients without prior urethroplasty operations, urethroplasty success rates by the same senior surgeon approached 95% (19-22).

Tang et al reviewed a series of four patients undergoing re-operative posterior urethroplasty. They reported a 50% success rate with buccal mucosa graft urethroplasty with two patients requiring repeat operations after failure. All four patients underwent anastomotic re-operative urethroplasty. Patients who failed required internal urethrotomy and repeat dilation procedures (23).

Wadhwa et al reported a series of twenty-three re-operative posterior urethroplasty patients with one to five years follow up. Their reported success rate was 87%. However, when evaluating their outcomes with the definition of failure as requiring repeat urethroplasty or more than one endoscopic procedure, the success rate was only 35%. Fifteen patients required repeat open urethroplasty or more than one internal urethrotomy or dilation post-operatively (6).

DISCUSSION

Overall, success rates with re-operative urethroplasty ranged from 35% to 85% in five studies. This wide range of success rates is likely attributable to surgeon experience and the extent of prior urethral reconstruction procedures that are more likely to make re-operative urethroplasty relatively more easy or difficult. These results indicate that re-operative urethroplasty success rates can still be quite successful

in the hands of an experienced surgeon, but success rates are lower than that of patients undergoing their first urethroplasty procedure (1).

Success in urethroplasty procedures is defined differently in many case series, and care must be taken to understand the criteria for defining success and failure when comparing outcomes across studies. In the studies we reviewed, the published success rate was sometimes different than the comparison rate we listed in Table I (6).

Standardized surveillance protocols to monitor urethroplasty success are required to make urethroplasty outcomes comparable across studies for clinical research and patient care. Factors that likely contribute to re-operative urethroplasty failure include alterations in blood supply after prior urethroplasty, poor tissue quality or lack of well perfused, non-scarred tissue to complete the urethral reconstruction (24).

There has been a move to evaluate patient reported outcome measures of urethroplasty procedures not always accounted for with prior urethroplasty outcome studies (25,26). These include including sexual and voiding function. Since many urethroplasty series often rely upon historical, retrospectively collected data, retrospective patient reported outcome measure information is not always available for analysis. We recommend that future studies include validated, uniform, prospectively collected patient centered outcomes measures. This will help better compare results across studies in the future.

Table I. Comparison of Re-operative Urethroplasty Articles and Outcomes.

Author	Journal	Year	Stricture Location	N ^o Re-operative Patients	Success Rate
Aggarwal et al	J P Urol	2011	Posterior	12	75%
Bhagat et al	World J Urol	2011	Posterior*	43	83.70%
Blaschko et al	J Urol	2012	Anterior	130	78%
Tang et al	Kaohsiung J	2012	Posterior	4	50%
Wadhwa et al	J Urol	1998	Posterior	23	35%

Failure defined as need for more than one postoperative dilation or DVIU or repeat urethroplasty

* Two patients in series with anterior urethroplasty

CONCLUSIONS

Few articles address outcomes of re-operative urethroplasty patients. In a systematic review of re-operative urethroplasty outcomes, five studies with 212 total patients were identified. Re-operative urethroplasty success rates ranged from 35% to 85%. Overall, studies with a higher number of patients had higher success rates.

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