Urethroplasty: Progress and results from a tertiary reference centre

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Abstract

Introduction: Male urethral strictures are a common condition, usually treated with urethral dilatations and internal urethrotomy. The efficacy of the aforementioned methods, especially in the long-term, is limited compared to the open approach. Although open urethroplasty today is regarded as the gold standard in the treatment of urethral strictures, its use is very limited in the everyday clinical practice. At the 1st University Urology Clinic of the Laiko Hospital, urethroplasty is offered as treatment of choice in new stricture cases as well as in cases where conventional methods have failed.

Materials & Methods: From 2011 to 2016, 56 open urethroplasties have been performed. The majority was performed for anterior strictures, mostly due to endoscopic manipulation. All posterior strictures were due to traumatic injuries. The characteristics of the strictures and previous approaches were registered during the preoperative assessment. All patients were treated with anastomotic and/or augmentation urethroplasty. In case of graft usage, the type and placement was recorded. All patients were postoperatively evaluated using a scheduled follow-up plan.

Results. The overall success was 83.9%, reaching 100% in cases with none or one previous treatment. The postoperative and long-term complications were analyzed. The progress in the clinical practices applied is reported, in terms of postoperative evaluation methods and operative techniques.

Conclusion: Urethroplasty is an effective and durable solution for urethral strictures, which requires optimal familiarity with the surgical field and the available techniques.

Key words: urethroplasty; urethra; stricture; buccal mucosa

Introduction/Purpose
Male urethral strictures are a common condition in men, with an incidence of 229-627 cases per 100,000 high-risk men in literature and a total prevalence of approximately 0.6%1, 7, 8. The incidence of the disease increases with age, especially after 55 years. In England, its incidence is estimated at 10 cases per 100,000 younger men, a number that doubles in men aged 55 years and exceeds 100

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in ages of >65 years. In the US, it is estimated to affect 200 cases per 100,000 young men and >600 male patients aged > 65 years. Data from both countries record high numbers of hospital admissions annually for surgery and correspondingly very high costs and charges for the respective health systems.

The most common treatment options for the treatment of urethral strictures are dilation and visual internal urethrotomy; both techniques have been applied over the last 40 years. When compared, both methods show similar efficacy and high relapse rates, exceeding 60% in the 2-year range. Newer studies on the efficacy of internal urethrotomy show that its overall success rate does not exceed 30% at 3 years, with repeated interventions failing even at 100% after 3 sessions. Similar results and increased complications have been reported with the use of urethral stents. Open urethroplasty is currently the gold standard for the treatment of male urethral strictures. Urethroplasty is based on the excision of the affected segment and the end-to-end anastomosis of the urethra, the use of grafts or flaps to increase the diameter of the stenotic segment or a combination of both. All approaches have low morbidity rates and excellent long-term efficacy, of over 95% in some series. Today, the oral mucosa has largely substituted skin flaps. Despite the documented superiority of urethroplasty as compared to conventional methods, its use in everyday clinical practice remains limited.

At the 1st University Urology Clinic of the Laiko Hospital, urethroplasty has now largely replaced dilations and internal urethrotomy in the treatment of male urethral strictures, both as first-line therapy and as cases of failure of conventional methods. The purpose of this study is to record the results of urethroplasty procedures, with emphasis on the development of diagnostic and treatment techniques and their long-term efficacy.

Materials & Methods

56 urethroplasty procedures were carried out from 2011 to 2016. Of these, 53 were carried out from 2013 to today, with a mean follow-up of 21 months. Anatomically, 46 strictures involved the anterior and 10 the posterior urethra. The majority of anterior urethral strictures were due to endoscopic manipulations or catheter placement (27/46), followed by postinflammatory strictures (11/46), while there were also cases without a related background history, classified as idiopathic (8/46). Overall, posterior urethral strictures were due to preceding traumatic injuries (10/10). As regards previous treatments, the patients had been initially treated by endoscopic urethrotomy (0-12 operations, avg 2.3), dilation (0-12, avg 3.9), while 4 cases had been treated by urethroplasty, without further information being available. The length of the strictures was 1.5-14 cm (avg 3.6 cm). Mean Qmax at uroflowmetry was 7.7 ml/sec. The mean follow-up of patients was 21 months, while a monitoring protocol was followed with assessment upon removal of the catheter, 1, 3 and 6 months thereafter and then every six months.

Preoperatively, the cases were assessed by retrograde urethrography (RUG), voiding cystourethrography (VCUG), uroflowmetry, urethroscopy, urine cultures and urethral swabs. The majority of anterior urethral strictures were treated with augmented urethroplasty (34/46) and the rest with anastomotic urethroplasty. Posterior urethral strictures were treated with anastomotic urethroplasty (9/10), while one case was treated with augmented anastomotic urethroplasty. Oral mucosa was used in all cases of augmented urethroplasty. Buccal mucosa was used in 34 cases (bilateral grafts in 3 cases of panurethral strictures), labial mucosa in 1 case and a combination of labial and buccal mucosa in 1 case. Graft positioning was dorsal in 8 cases, ventral in 9, lateral in 8 and dorsolateral in 10 cases. In 26/35 of cases using buccal mucosa and in all cases using labial mucosa, this was followed by the stapling of the mucosa-providing position. Patients were discharged on the first postoperative day. In the cases of end-to-end anastomosis, the urinary catheter was removed after 3 weeks and in the cases of augmented urethroplasty after 4 weeks.

Postoperatively, the patients were assessed by voiding cystourethrography upon removal of the catheter, uroflowmetry and by urine residue assessment.

Results

A urethroplasty is considered successful if there is no need for further intervention after the surgery. Its overall success (no instrumentation rate) amounted to 83.9% (47/56). The individual rates were 80.95% for anastomotic urethroplasty and 91.4% for augmented urethroplasty. Importantly, the success rate in cases
with a history of one or no intervention (dilation or internal urethrotomy) was 100%. Dilation was performed in 7 cases (1-2 sessions). These concerned 4 cases of anastomotic urethroplasty, 1 augmented urethroplasty and 2 revisions of previous urethroplasty surgeries. A catheter was placed for 3 days postoperatively in 1 case of augmented urethroplasty. One case of augmented urethroplasty required reoperation due to recurrence of the stricture. The patients’ mean Qmax after removal of the catheter was 16.6ml/sec. Immediate postoperative complications were limited to perineal haematomas (2/46 in anterior urethral strictures and 3/10 in posterior urethral strictures), which were treated conservatively and infections (4/46 of cases of anterior strictures), treated with antibiotics. Regarding the graft donor site in cases where such was used, overall, patients reported atypical symptoms, which however did not affect food intake, did not require any intervention and had been resolved at the time of catheter removal.

In developmental terms, during the diagnostic approach, clinical practice imposes the collection of as much information as possible about each case. Clinical practice has been complemented by urethral swab cultures, particularly in cases with a related history or multiple endoscopic interventions.

Intraoperatively, urethroscopy immediately preoperatively or intraoperatively, during the preparation of the urethra, has proven particularly valuable in the identification of the proximal edge of the stricture. Similarly, the placement of a guide wire during urethroscopy helps significantly in delimiting a correct line on incision.

In augmented urethroplasty, the position of the graft has been found not to affect the effectiveness of the operation. It is however particularly important to position and fix the graft in a position ensuring the sufficient contact thereof with the tissues, in order to ensure its perfusion. In this case, the dorsolateral positioning of the graft with mobilisation of the urethra to the middle of the dorsal surface provides optimal results, especially in cases where the stricture is located in the curve of the bulbar urethra. For this reason, the diligent fixation of the graft to the surrounding tissues represents a crucial time of the operation.

In the anastomotic approach, the extensive mobilisation of the urethra ensures the optimal handling thereof, while the application of techniques such as the separation of the corpora cavernosa have allowed the management of long strictures. The fixation of the corpus spongiosum to the surrounding tissues has proven particularly useful for minimising tension.

Conclusions
Urethroplasty is an effective, durable solution for the management of strictures, with low morbidity rates and excellent patient satisfaction. The choice of each method is largely associated with the etiology, the position and length of the stricture, any previous interventions, co-existing local pathological findings, the surgeon's experience and patient preference. Urethroplasty has proved its place in the treatment of urethral strictures, both newly diagnosed and in cases where conventional methods have failed.

In any case, a thorough knowledge of the available surgical techniques and familiarity with the surgical field are required. Thorough preoperative planning and intraoperative flexibility are necessary for a customised approach, in order to offer the best solution to each case.

This study concerns the largest series of urethroplasty surgeries in our country, from an academic centre of reference in the field of reconstructive urology. The strengths of the study include the large sample of cases and the number and type of examined methods. It is particularly important that a large percentage of these cases relate to referrals, which demonstrates a significant effort on the part of the urological community to move away from conventional, ineffective practices.

Conflicts of interest
The authors declared no conflicts of interest.
Περίληψη
Έσταση: Τα ανδρικά στενώματα ουρήθρας, αποτελούν μια συχνή πάθηση, που αντιμετωπίζεται συνήθως με ενδοσκοπική ουρηθροτομή και διαστολές ουρήθρας. Η αποτελεσματικότητα, ιδιαίτερα σε ευρούς χρόνο, αυτών των μεθόδων είναι πολύ μικρή σε σχέση με την ανοικτή προσπέλαση. Η ανοικτή ουρηθροπλαστική, μολονότι αποτελεί σήμερα τον χρυσό κανόνα για την αντιμετώπιση των στενωμάτων, εμφανίζει μικρή διείσδυση στη καθημερινή κλινική πρακτική. Στην Α' Πανεπιστημιακή Ουρολογική Κλινική του Λαϊκού Νοσοκομείου, η ουρηθροπλαστική προσφέρεται ως μέθοδος εκλογής τόσο σε νέα περιστατικά, όσο και σε περιπτώσεις αποτυχίας των συμβατικών μεθόδων.

Υλικό & Μέθοδοι: Από το 2011 έως το 2016, έχουν πραγματοποιηθεί 56 ουρηθροπλαστικές. Η πλειονότητα αφορά σε στενώματα πρόσθιας ουρήθρας και αιτιολογικά σχετίζονταν με ενδοσκοπικούς χειρισμούς. Τα στενώματα της οπίσθιας ουρήθρας οφείλονταν στο σύνολο τους σε τραυματικές κακώσεις. Έγινε καταγραφή των χαρακτηρών των στενωμάτων και των προηγηθέντων χειρισμών κατά την προεγχειρητική εκτίμηση και αντιμετωπίστηκαν με ουρηθροπλαστική, αυξητική ή/και αναστομωτική. Στις περιπτώσεις όπου χρησιμοποιήθηκε μόσχευμα, καταγράφηκε το είδος και η θέση αυτού. Οι ασθενείς τέθηκαν σε πρόγραμμα μετεγχειρητικής παρακολούθησης.

Αποτελέσματα: Συνολικά η επιτυχία ανήλθε στο 83,9% και έφτασε το 100% στα περιστατικά με καθόλου ή μία προηγούμενη παρέμβαση. Αναλύθηκαν οι μετεγχειρητικές και απώτερες επιπλοκές καθώς και οι τροποποιήσεις στην προεγχειρητική προσέγγιση και διεγχειρητική αντιμετώπιση μέχρι σήμερα, ως εξέλιξη των κλινικά εφαρμοζόμενων πρακτικών.

Συμπεράσματα: Η ουρηθροπλαστική αποτελεί μια μέθοδο αποτελεσματική και ανθεκτική στο χρόνο, πλην απαιτεί όμως άριστη γνώση και των διαθέσιμων τεχνικών.

Λέξεις ευρετηριασμού
ουρηθροπλαστική, στένωμα, ουρήθρα, στοματικός βλεννογόνος

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