

Prevention of stricture recurrence following urethral internal urethrotomy: routine repeated dilations or active surveillance?

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Abstract

Strictures of the urethra are the most common cause of obstructed micturition in younger men and there is frequent recurrence after initial treatment. Currently, routine repeated dilations, including intermittent self-catheterisation (ISC) are prescribed by urologists to prevent urethral stricture recurrence. There is, however, no high level evidence available supporting the effectiveness of practicing these painful techniques. Balancing efficacy, adverse effects and costs, we hypothesize that active surveillance is a better option for preventing stricture recurrence as compared with routine repeated dilations. However, well designed, adequately powered multi-center trials with comprehensive evaluation are urgently needed to confirm our hypothesis.

INTRODUCTION

The term urethral stricture refers to the reduction of the urethral lumen from a scarring process, which could result from trauma, localized inflammation and iatrogenic or idiopathic pathologies. The estimated urethral stricture prevalence in the UK ranges from 10/100,000 to 100/100,000 and even higher in the USA, putting heavy financial burden on patient and the health services.^(1, 2) When the maximum urinary flow rate is < 5 mL/s, urethral stricture is always associated with particularly troublesome progressive voiding symptoms and urinary tract infections (UTIs).⁽³⁾ Open urethroplasty is regarded as the gold standard treatment of urethral strictures.⁽⁴⁾ However, internal urethrotomy (IU) and urethral dilatation are still widely performed all over the world^(5,6) even when the risk of recurrence is estimated to be high. The most common complication of urethral reconstructive surgery is recurrence of stricture. Currently, routine repeated dilations including intermittent self-catheterisation (ISC) are routinely prescribed by most urologists for urethral stricture recurrence prevention. Despite this routine gained widespread acceptance, as far as we know, there is no high level supportive evidence from randomized clinical trials regarding this practice. In several studies, postoperative ISC seem to reduce the stricture recurrence rate,⁽⁷⁾ but due to the flaws of the nonrandomized design, the lack of information, the non-considerable follow-up times, the non-comprehensive evaluation and the retrospective case-control analysis, we should not jump to conclusions. Furthermore, a prospective randomized study conducted by Matanhelia et al.⁽⁸⁾ suggested that there were no stricture recurrence prevention effects in patients pretreated with internal urethrotomy. There is also evidence that repeated dilations do not significantly reduces the risk of hospitalization or the need for 'surgical' dilatation or urethrotomy in case of recurrent strictures,⁽⁹⁾ and instead, it even exacerbates scar formation, thus adding to stricture length and severity.⁽¹⁰⁾

Our hypothesis is that active surveillance with close follow-ups could be a better option than routine repeated dilations for preventing stricture recurrence following urethral internal urethrotomy. There is scientific evidence for supporting our hypothesis:

Challenges for practicing dilation

Routine repeated dilations following urethral internal urethrotomy are mostly performed by patients or their relatives, which can impose both physical and emotional challenges. It evokes a variety of embarrassment and shock as men are usually unfamiliar with and sometimes fearful of the concept when initially introduced to ISC. They are worried about causing damage to themselves.⁽¹¹⁾ In addition, manual dexterity, cognitive ability and patient's general health are important for practicing ISC, many patients simply stop using it because of the sheer inconvenience,⁽⁸⁾ indicating that not all the patients should be recommended to implement this procedure. Each structure of the urethral lumen after reconstruction has its unique features. Even for the well-trained surgeons, the practice of blind passage of filiforms and blind dilations without knowledge of the anatomy of the urethral stricture is indeed worrying. For the patients, severe damage could be introduced by blind ISC.

Routine repeated dilations destroy the wound healing process

The primary change after urethral reconstruction is metaplasia of the urethral epithelium from its normal pseudo-stratified columnar type to stratified squamous epithelium,⁽¹²⁾ which is a more fragile epithelium. Considering this process, urethral reconstruction is usually performed 3-6 months later to give time for healing of the initial assault for which the patient had sought treatment. Shearing force caused by repeated dilations tends to split the urethral epithelium. These fissures or ulcers lead to focal extravasation of urine on voiding that in turn leads to subepithelial fibrosis.⁽³⁾ Bleeding is often present during dilations. If bleeding occurs, the stricture has

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been unfortunately torn rather than stretched, further injuring the involved area and producing further scarring. Immediate difficulty with urination or development of acute urinary retention after dilations are commonly seen in daily clinical practice, and is mostly attributed to local tissue edema, implicating dilations, impairing the stricture area or even increasing the degree of scarring.

Complications caused by repeated dilations

Septicemia after dilatation was once the main risk in treated patients in the 20th century. With the development and wide application of antibiotics, the incidence and mortality of these septic episodes have decreased dramatically. But still, UTIs or asymptomatic bacteruria are familiar complications after dilation/catheterization by the healthcare workers. This complication can logically be observed more often when conducted by patients with improper or poor sterile techniques. As an invasive blind operation, dilation/ISC was also often associated with other complications including pain, haemorrhage, haematoma, false passage, extravasation, urethral perforation, rectal injury, sexual dysfunction and knotting/breaking/bending of the filiform leader.⁽¹³⁻¹⁵⁾

Long-term evaluation and cost-effectiveness

Although endoscopic treatments such as urethral dilation can transiently improve urinary flow, repeated instrumentation exacerbates scar formation, thus adding to stricture length and severity. Recurrent urethral stricture after repeated interventions is usually more complex with worsening conditions; making a more difficult and definitive open repair approach inevitable. A number of studies showed that the success of reconstruction is diminished by multiple prior urethral dilations and internal urethrotomy.^(10,13) For most patients in whom dilations have failed, urethroplasty is usually the only curative option. As we know, there is still no cost-effectiveness analysis of active surveillance versus repeated dilations regarding urethral stricture recurrence prevention. Considering the costs of inpatient and outpatient medical care, including the complications caused by repeated dilations and the more difficult and definitive open repair approach following repeated failed dilations, together with the socio-economic burden, we believe that active surveillance might be more cost-effective. Voiding improvement might be achieved with repeated urethral dilations by causing the urethral lumen to be temporarily maintained. However, this improvement is maintained at the expense of extending the stricture longitudinally, and decreasing the calibre of the urethral lumen by the fibrotic process as dilations stop abruptly. Although there is a lack of evidence, unfortunately, routine repeated dilations are still widely recommended. Unless there is a significant improvement after repeated dilations, we believe active surveillance with close follow-up, together with urodynamic studies might be a better option for urethral stricture prevention. When a weaker urinary stream occurs, an attempt of a few dilations by experienced surgeons can be an option before urethroplasty, but should not be overused. In most cases, urethroplasty should be selected. Active surveillance can save stable patients from unnecessary lifelong ISCs and also the patients who needed urethroplasties from dilation-caused worsening conditions. Anyway, well designed, adequately powered trials are needed for answering the relevant clinical ques-

tions more than just stricture recurrence rate, and more importantly, to understand which intervention is better for urethral stricture recurrence prevention considering the balance of efficacy, adverse effects and costs.

CONFLICT OF INTEREST

None declared.

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