Balloon dilatation for male urethral strictures “revisited”

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INTRODUCTION

Sequential dilation with metal sound and boogies has been practiced for urethral stricture disease since a long time. It is usually performed under local anesthesia and often is associated with significant discomfort, urethral bleeding, extravasations, and secondary spongiosisfibrosis due to shearing forces associated with serial dilation resulting in poor outcome.[1]

There are myriad treatment options to manage short segment urethral strictures which include endoscopic approaches and urethroplasties. Direct visual internal urethrotomy (DVIU) is an endoscopic treatment option for short segment anterior urethral strictures with success rates in the range of 46 to 76%.[1-3] Urethroplasty offers patients the greatest chance for cure; however, it requires surgical expertise.[4] Balloon dilation is a minimally invasive technique that has a potential to offer an alternative to DVIU.[5] It dilates by radial application of forces against the stricture, avoiding the potentially shearing forces associated with sequential rigid dilation. Theoretically, it reduces urethral trauma; thus, it reduces subsequent spongiosisfibrosis and potentially may translate into improved therapeutic outcomes. The potential complications with DVIU include bleeding and extravasation. In addition, it involves a certain amount of learning curve. Urethral balloon

Abstract

Aims: To analyze the results of balloon dilatation for short segment male urethral strictures.

Materials and Methods: Retrospective analysis was done of 120 patients undergoing urethral balloon dilatation since January 2004 to January 2012. The inclusion criteria for analysis was a short segment (less than 1.5 cm) stricture, exclusion criteria were pediatric, long (more than 1.5 cm), traumatic, malignant strictures. The parameters analyzed included presentation of patients, ascending urethrogram (AUG) and descending urethrogram findings, pre- and postoperative International prostate symptoms score (IPSS), uroflowmetry (Q\text{max}), and post-void residue (PVR). Need for self calibration/ancillary procedures were assessed. Failure was defined as requirement for a subsequent endoscopic or open surgery. A urethral balloon catheter (Cook Urological, Spencer, Indiana) is passed over a guide wire after on table AUG and inflated till 180 psi for 5 minutes under fluoroscopy till waist disappears. Dilatation is followed by insertion of a Foley catheter. Patients were followed up at 1, 3, and 6 months.

Results: Mean age was 49.86 years. Mean follow-up was 6 (2–60) months. IPSS improved from 21.6 preoperatively to 5.6 postoperatively. Q\text{max} increased from 5.7 to 19.1 and PVR decreased from 90.2 to 28.8 (P < 0.0001*) postoperatively. At 1, 3, and at 6 monthly follow-up, 69.2% (n = 82) patients were asymptomatic.

Conclusions: Balloon dilation is a safe, well-tolerated procedure with minimal complications. Further randomized studies comparing balloon dilatation with direct internal visual urethrotomy are warranted.

Key Words: Balloon dilatation, direct visual internal urethrotomy, urethral stricture
dilatation has the potential advantage of being less morbid and is technically simpler to perform. The majority of the studies done for balloon dilatation are anecdotal studies and lack follow up. In this analysis, we have “revisited” the technique of urethral balloon dilatation to assess its role in contemporary management of stricture urethra.

The aim of the study was to evaluate and revisit the technique in terms of the short-term efficacy short segment male urethral strictures.

**MATERIALS AND METHODS**

An institutional review board (IRB) approval was taken prior to initiating the analysis. Retrospective analysis of consecutive patients \( n = 120 \) undergoing urethral balloon dilatation since January 2004 to January 2012 was done. Inclusion criteria were short segment (<1.5 cm) stricture on ascending urethrogram (AUG). Exclusion criteria were pediatric patients, long length strictures (longer than 1.5 cm), strictures after distraction injury, and malignant strictures. Parameters studied were – presentation of the patients, stricture site, location and length of stricture on AUG, International prostate symptoms score (IPSS), uroflowmetry \( (Q_{\text{max}}) \), post-void residual urine volume (PVR). Need for post-procedural self calibration and ancillary procedures was analyzed. Requirement of the same or any other endoscopic or open surgery was considered as failure. Subsequent follow ups were at 1, 3, and 6 months.

The urethral balloon catheter set consists of (Cook Urological, Spencer, Indiana, USA) a 6F open-lumen, blunt-tip catheter and a 8-cm balloon that inflates fully to 24F at a maximum inflation pressure of 181 psi, using a pressure injector device [Figures 1 and 2]. The procedure starts with a “on table” urethrogram to assess the length and site of stricture. A 0.038 inch hydrophilic guide wire is passed across the stricture. The hydrophilic property allows the wire to negotiate the narrow portion. Balloon dilatation of the stricture is done under fluoroscopic guidance. The disappearance of waisting indicated adequate dilatation [Figure 3]. Duration of the dilatation was 5 minutes. Cystoscopy with 19 Fr sheath was done to assess the urethra [Figure 4] and the dilated segment for any bleeding or mucosa tear. 16 Fr Foley’s catheter was inserted.

**RESULTS**

A total of 120 patients were analyzed who had short segment urethral stricture. Patient’s age ranged from 30 to 85 years (mean, 49.86 years). Follow up was 2 to 60 months (mean, 6 ± 8.1 months). Twelve patients (10%) were not fit for anesthesia, in these patients, the procedure was done under local anesthesia.

79.16% \( (n = 95) \) had bulbar, 15.83% \( (n = 19) \) had penile, and 5% \( (n = 6) \) had membranous strictures.

Average duration of symptoms was 23.6 ± 4.1 months.
Urethral stricture treatment continues to be important first line procedure selection. Despite initial enthusiasm for the new technology, laser urethrotomy appears to offer no advantage over conventional internal urethrotomy. Minimally invasive management of urethral stricture with balloon dilatation is safe and effective option, short-term success rates are acceptable and compares favorably with that of other published non-operative therapies such as DVIU.

There have been anecdotal reports in the past regarding application of urethral balloon dilatation in the management of urethral stricture. The present series represents the largest series of management of urethral strictures with balloon dilatation. Our results suggest that urethral balloon dilatation is a potential alternative to DVIU.

**CONCLUSIONS**

Minimally invasive management of urethral stricture with balloon dilatation is effective in the management of short segment non-traumatic urethral stricture. Balloon dilatation of the urethra is safe and effective option, short-term success rates are encouraging. Further randomized studies comparing balloon dilatation with DVIU are warranted.

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