

Distal Intramural Urethral Pathology in Women

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Abbreviations and Acronyms

CIC = clean intermittent catheterization
DIU = distal intramural urethral pathology
LUTS = lower urinary tract symptoms
MRI = magnetic resonance imaging
PVR = post-void residual urine
SUI = stress urinary incontinence
UDA = urethral dilation using general anesthesia
UDI-6 = Urogenital Distress Inventory-Short Form
UDS = urodynamic study
VCUG = voiding cystourethrogram

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For other articles on related topics see pages 1382 and 1389.

Purpose: We reviewed the evaluation of distal intramural urethral pathology in women and its management using urethral dilation and general anesthesia.

Materials and Methods: After receiving institutional review board approval we reviewed consecutive charts of women who underwent urethral dilation under general anesthesia for distal intramural urethral pathology. The pathological condition was defined as bothersome lower urinary tract symptoms with distal urethral narrowing and proximal ballooning on lateral voiding cystourethrogram. Patients with extramural, intraluminal or nondistal urethral pathology or neurogenic bladder were excluded from study. Success was defined as complete or major lower urinary tract symptom improvement 6 months after 1 urethral dilation using general anesthesia and no need for a repeat or another procedure.

Results: Eight of 101 cases (8%) reviewed between 1998 and 2010 were lost to followup at less than 6 months. Of the remaining 93 patients with a mean \pm SD age of 52 ± 16 years and a mean followup of 46 ± 37 months 47 (51%) were classified as success. The failure group had a mean age of 50 ± 16 years and a mean time to failure of 8 ± 12 months. A history of urethral dilation was more common in the failure group (17% vs 39% cases, $p = 0.02$).

Conclusions: Urethral dilation using general anesthesia is effective in some women with distal intramural urethral pathology diagnosed after extensive evaluation, including imaging and urodynamics. Distal intramural urethral pathology is a rare entity and these results are not applicable to women with nonspecific lower urinary tract symptoms.

Key Words: urethra; lower urinary tract symptoms; female; dilatation; anesthesia, general

URETHRAL dilation has been widely used for various urethral conditions in women. Specifically urethral dilation has been described for female urethral stricture disease and urethral syndrome defined as LUTS, such as dysuria, frequency and urgency, without a specifically identifiable pathological condition.¹⁻⁴ While office urethral dilation has been popular for a long time,³ there is a dearth of information on its long-term efficacy in women. Recently Santucci et al proposed that the widespread use of urethral dilation for nonspecific

LUTS is a quality of care issue in urology and acknowledged that urethral dilation is well reimbursed by Medicare despite the lack of supporting studies of its efficacy.⁵

Older reports show conflicting results of the efficacy of urethral dilation vs internal urethrotomy.⁶⁻⁸ However, since urethral dilation poses a lower risk than internal visual urethrotomy or urethroplasty, the procedure has been favored as first line therapy. Smith et al advocated the efficacy of urethral dilation followed by long-term CIC for female urethral

stricture disease⁹ but other supporting evidence of the usefulness of urethral dilation for stricture disease is lacking. For women treated with urethral dilation for LUTS a recent PubMed® search showed only 1 study in the last decade of long-term clinical outcomes.¹⁰

In 1988 Massey and Abrams reported their experience with obstructed voiding in females and described a separate entity that they termed intramural urethral pathology.¹¹ This condition differed from extramural etiologies or intraluminal causes and some patients responded well to UDA. We reviewed our long-term experience with the evaluation and diagnosis of DIU, and the role of UDA to treat it.

METHODS AND MATERIALS

After receiving institutional review board approval we reviewed the consecutive charts of women who underwent UDA for DIU between 1998 and 2010. In our study DIU was defined as bothersome LUTS in a woman with distal urethral narrowing identified on lateral VCUG in the absence of an extramural (ie external urethral compression) or an intraluminal (ie caruncle or stricture) etiology. Patients with neurogenic bladder, chronic bladder and/or trigonal infection, large bladder prolapse (greater than stage II), a mental disorder (ie Alzheimer disease), prior urethral diverticulum repair or levator overactivity were excluded from study. When suspected, functional obstruction from the levator muscles was excluded by the site of narrowing on VCUG and by surface electromyography.

Evaluation typically consisted of an extensive history review, including the history of previous urethral dilations, presenting symptoms, pertinent physical examination findings, noninvasive uroflowmetry, PVR measurement and lateral VCUG. The latter procedure could not be done in some patients due to presenting symptoms of urethral pain, fear of pain upon catheter insertion or insurance issues related to testing. VCUG was performed according to protocol.¹² True lateral voiding views revealed a typical finding of distal urethral narrowing with proximal ballooning of the urethra and bladder neck (fig. 1). Additional studies, including urethral MRI, UDS and urethrocytostomy, were recommended as clinically indicated. Noninvasive uroflowmetry and PVR measurement were done before instrumentation and sometimes also after completing flexible urethrocytostomy in office.

Office urethrocytostomy was performed with a flexible instrument after instillation of lidocaine 2% for 10 to 15 minutes. The purpose of cystoscopy was to exclude an intraluminal pathology such as meatal stenosis, caruncle, tumor, diverticulum opening or foreign bodies. Surface coil urethral MRI allowed the documentation of DIU due to fibrosis.¹³ Urethral fibrosis on MRI was quantified as absent, mild, moderate or severe by a dedicated MRI radiologist. Urethral MRI was also useful to exclude extrinsic compression, tumor or urethral diverticulum. Although MRI was systematically ordered to evaluate DIU, it was not always done due to cost, insurance coverage or metal in the body.

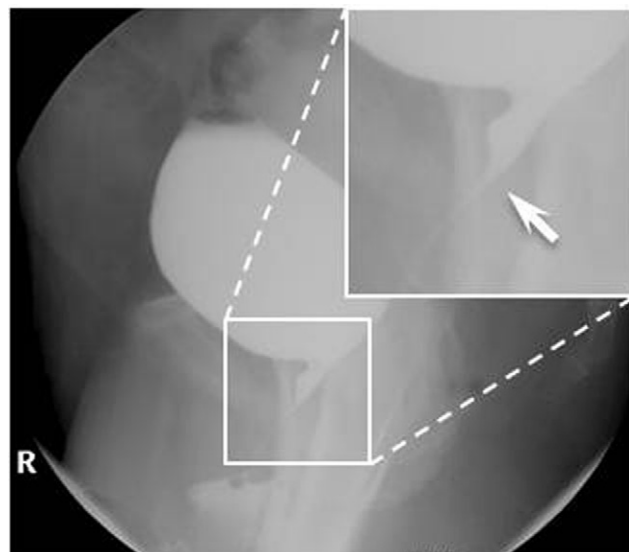


Figure 1. Lateral VCUG reveals distal urethral narrowing (arrow) with mid and proximal urethral ballooning, suggesting obstruction.

UDS was performed according to International Continence Society testing recommendations.¹⁴ This testing was considered in patients with no urethral pain or urinary tract infection and typically when urethral obstruction was clinically or radiographically suspected. Pressure flow parameters were interpreted according to prior cutoff values in the literature.¹⁵ Only studies with a minimum voided volume of 100 ml were interpreted. For mean maximum flow and PVR only patients with retrievable values preoperatively and postoperatively are reported.

In this series the decision to proceed with UDA was based on bothersome LUTS with distal urethral narrowing and proximal ballooning on VCUG in the absence of another extramural or intraluminal cause. Urethral dilation was performed using brief general anesthesia on an outpatient basis. This was done to avoid procedural pain and optimize procedure results by achieving greater dilation than an awake patient could tolerate.

Sequential dilation was done with increasing female sounds (Pratt dilators) from 25Fr to 41Fr, as similarly performed in a prior study.¹⁶ All procedures were done by the same physician (PEZ). If tearing occurred at the urethral meatus, often 6 and/or 12 o'clock position, a few interrupted 4-zero absorbable sutures were placed transversely for hemostasis. These sutures approximated the urethral mucosa to the adjacent vaginal wall to avoid further narrowing the distal urethra (fig. 2). Perioperative complications and followup visits at 6 weeks, 6 months and yearly thereafter were reviewed, mostly from electronic records.

Success was defined as 1 UDA procedure resulting in complete or major LUTS resolution at a minimum of 6 months of followup and no need for repeat UDA or another procedure. Any case that required additional treatment to relieve LUTS, ie repeat UDA, urethroplasty, CIC, anticholinergic medication or physical therapy, at any time during followup or showed recurrence comparable to pre-

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