

IS THERE A ROLE FOR PERIURETHRAL COLLAGEN INJECTION (PCI) IN THE MANAGEMENT OF URODYNAMICALLY-PROVEN MIXED URINARY INCONTINENCE (MUI)?

Hypothesis / aims of study

To investigate the effectiveness of PCI in the management of patients with combined intrinsic sphincteric deficiency and detrusor overactivity (DO).

Study design, materials and methods

After institutional review board approval, retrospective chart review was performed on all patients who underwent PCI between 2/99–7/03 (n=56); those with DO and stress incontinence (SUI) documented on multichannel urodynamics (UDS) were selected for this study (n=16). During this period, a treatment approach addressing ISD with PCI as first line therapy was applied to all patients with MUI. All PCI were performed by a single surgeon. Inclusion criteria for this study were (i) clinical history of MUI, (ii) DO observed on UDS (defined as any increase in detrusor pressure and/or sensation of urgency with or without incontinence during filling cystometry), (iii) SUI due to intrinsic sphincteric deficiency without urethral hypermobility based on physical exam, supine stress test, UDS (with differential Valsalva leak point pressure (VLPP) determinations), and voiding cystourethrography with standing lateral views at rest and straining. All patients received routine follow-up with serial history, symptom and quality of life (QOL) questionnaires (Urogenital Distress Inventory (UDI) (score 0-3), Incontinence Impact Questionnaire (IIQ) (score 0-4), and a global QOL visual analog scale (scale 0-10, 10=worst QOL), physical exam, and urethral 3D ultrasound (3DUS) to assess periurethral collagen volume and distribution. Transvaginal 3DUS of the urethra was performed by a single technician (Voluson 530D US machine, Medison America, Cypress CA, with 7.5-Mhz 3D probe). Outcome measures included UDI, IIQ and QOL questionnaire scores, need for anticholinergic medications (ACM), collagen volume retention and configuration on 3DUS, number of PCI required and need for additional surgical interventions. Statistical analyses for pre- and post-PCI outcomes were performed using a Wilcoxon signed ranks test for questionnaire outcomes and a paired t-test for 3DUS outcomes.

Results

Of 56 neurologically normal patients who underwent PCI during the accrual period, 43 presented with symptoms of MUI, of whom 16 (29%) demonstrated both DO and SUI on UDS. Mean follow-up was 18 months (6-39). Mean age was 65 (40-84). Ten underwent prior anti-incontinence procedures including retropubic or transvaginal bladder neck suspension (7), pubovaginal sling (1) and anterior vaginal wall suspension (2); 6 had prior anterior prolapse repairs. Six patients had failed ACM trials while 10 were ACM-naïve. Symptom and QOL scores were consistent with severe MUI with high scores on UDI questions 1 (frequency) (2.3 ± 0.8), 2 (urge incontinence) (2.1 ± 1.2) and 3 (SUI) (2.9 ± 0.4) as well as QOL (8.6 ± 2.1). UDS demonstrated DO in all patients (motor DO (14), sensory DO only (2)) and SUI in 14 with mean VLPP 54 ± 40 cmH₂O (18-146); 2 patients without SUI on UDS had a positive supine stress test. Mean maximum cystometric capacity was 278 ± 191 cc (65-750), mean detrusor pressure at maximum flow (PdetQmax) was 13 ± 7 cmH₂O and detrusor hypocontractility (PdetQmax < 10 cmH₂O) was observed in 7 (44%). Patients underwent a mean of 1.9 PCI (1-3) with mean injected volume 8.5 cc (5-17). Periurethral collagen volume measured by 3DUS was stable (2.4 ± 1.4 cc at baseline vs. 2.8 ± 1.6 cc at last follow-up, n=13, p=0.093) over a mean interval from most recent PCI baseline 3DUS of 19 months (4-36); circumferential and asymmetric volume configurations were observed in 65% and 35%, respectively. After PCI, statistically significant improvements were observed for UDI questions 1 (frequency) (1.3 ± 1.0 , p=0.021) and 3 (SUI) (1.8 ± 1.2 p=0.010) and QOL (5.2 ± 3.5 , p=0.026), while there was a trend to improvement for question 2 (urge incontinence) (1.4 ± 1.0 , p=0.068). IIQ question 7 (frustration) also significantly improved (3.3 ± 1.2 to 2.1 ± 1.7 , p=0.031). Four patients remained on ACM at last follow-up and only 1 patient proceeded to further surgical treatment with pubovaginal sling.

Interpretation of results

The initial management of MUI is usually directed at the urge component using ACM with overall disappointing results. We report on the opposite approach, whereby SUI is addressed primarily with a periurethral bulking agent. This study documents both objective and subjective improvement in both “components” of the patient’s symptoms using PCI as a primary intervention. This may be the optimal approach in the older patient with MUI in whom ACM alone has not been efficacious or poorly tolerated due to side effects, or in those with voiding dynamics suggestive of hypocontractility and who are at higher risk of voiding dysfunction after pubovaginal sling.

Concluding message

This study is the first to characterize the role of PCI a well-defined group of patients with MUI based on UDS. The results indicate that our approach to managing MUI with PCI as initial therapy to address ISD may optimize outcomes in these patients. In particular, PCI should be considered in those who have failed ACM or in whom a pubovaginal sling is more likely to result in post-operative voiding dysfunction.