

THE EFFECT OF FLUID ENTERING THE PROXIMAL URETHRA ON DETRUSOR PRESSURE AND THE SUBJECTIVE SENSATION OF URGE

Aims of Study

It has been proposed that the presence of fluid in the proximal urethra triggers a reflex bladder detrusor contraction, with the effect that complete bladder emptying is facilitated in normal micturition. Such a urethrovesical reflex has been demonstrated in awake ewes [1] using retrograde injected saline, and in nine healthy human volunteers using a saline-filled balloon to distend the proximal urethra [2]. The aim of this study was to investigate symptomatic women, attending for videourodynamic assessment in order to determine whether such a reflex is present in this group of patients and how it is modified by their underlying lower urinary tract pathology.

Methods

34 women attending a tertiary referral teaching hospital for video urodynamics were recruited to take part in the study. Videocystourethrography was performed using a Laborie Aquarius 120, external pressure transducers, 4Fg fluid-filled vesical and rectal pressure catheters and a 12 Fg filling catheter. In addition a second 4Fg fluid-filled vesical catheter, attached to a 10ml syringe of contrast medium was inserted into the urethra, with the tip just inside the bladder neck. Following routine filling cystourethrography, the filling line was removed and the position of the second 4Fg vesical catheter tip localised using fluoroscopic screening. A small amount of contrast was injected, whilst slowly withdrawing the catheter until a plume of contrast medium was identified at the bladder neck and proximal urethra. 4-6mls of contrast medium was then injected into the proximal urethra while simultaneously recording detrusor pressure. In addition the patient was asked at the end of bladder filling to subjectively grade their sensation of urgency from 1 to 10. This patient-assessed urgency score was repeated as the bolus of contrast medium was seen entering the proximal urethra and again 5 to 7 seconds after injection. Videocystourethrography was then continued in the normal manner with assessment of stress leakage, provocative manoeuvres, pressure-flow and assessment of post-void residual. Detrusor pressure change (ΔP_{det}) in response to contrast injection was calculated from the cystometrogram trace and compared to the patient-assessed urgency score, before, during and after injection of contrast.

Fig 1:

X-ray taken during fluoroscopic screening as 5 mls of contrast medium is injected retrograde into the proximal urethra up a 4 Fg catheter.

Bladder

Plume of contrast in proximal urethra

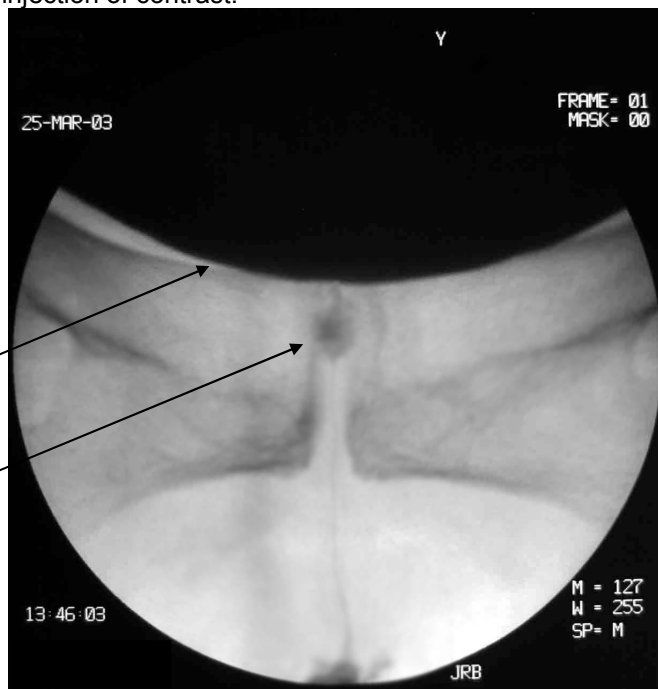
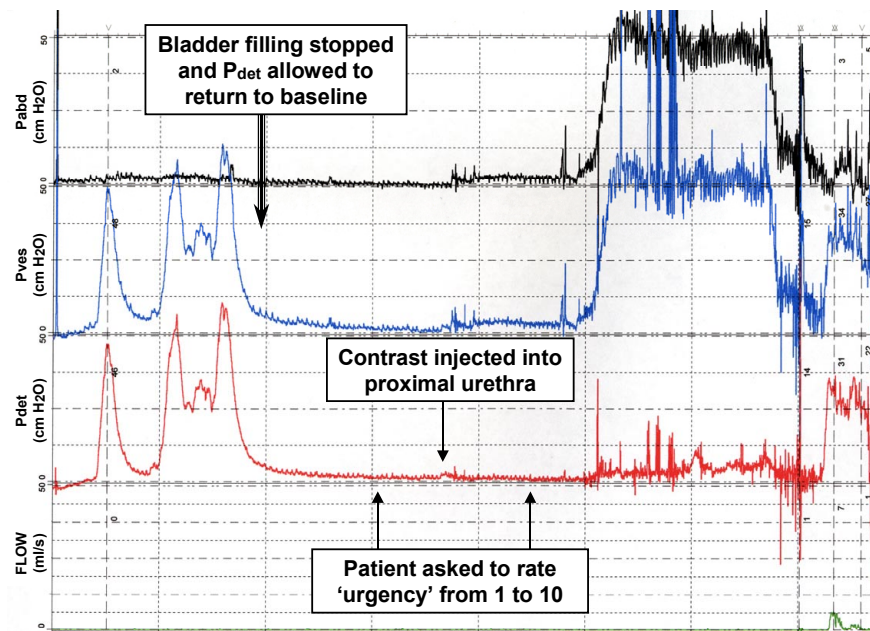


Fig 2: Cystometrogram of a 51y.o. woman with systolic detrusor overactivity. Despite having an overactive bladder, she reported no change in patient-assessed urgency score as a result of fluid in the proximal urethra and there was no demonstrable urethrovesical reflex present.



Results

The mean age of the patients included in this study was 46.7 (range 27 to 71). In none of the 34 women was any significant detrusor pressure rise demonstrable as a result of fluid being injected into the proximal urethra. The mean patient-assessed urgency scores showed a small but significant increase as fluid was injected into the proximal urethra. This was not a consistent finding and subjectively reported sensations varied considerably amongst the women studied. Neither objective nor subjective responses to the fluid provocation appeared to be related to urodynamic diagnosis.

Table 1: Comparison of mean urgency scores before, during and following injection of 4-6mls of contrast

Parameter	Mean +/- 1sd	Wilcoxon Signed Rank	
ΔPdet	No effect in 34/34		
Urgency Score A (pre-injection)	5.2 +/- 2.3	p=0.003	p=0.125
Urgency Score B (during injection)	6.0 +/- 2.2		
Urgency Score C (post-injection)	5.7 +/- 2.5		

Conclusions

The results of this study do not support the concept that fluid ingress into the proximal urethra provokes a reflex rise in detrusor pressure (urethrovesical reflex) in women with lower urinary tract symptoms. There is a suggestion that fluid entering the proximal urethra may increase the subjective sensation of urgency, but a larger study would be needed to demonstrate that this is a consistent and significant relationship. The contradictory findings of previous studies that have investigated this occurrence using animal models and urethral balloon distension are perhaps due to methodological differences.

References

1. *Neurourol Urodyn* 2001; 20: 641-649.
2. *J Urol* 2003;169: 1017-1019.