

Impact of 6F dual lumen urethral channel catheter on flow rate during video-urodynamic investigations

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Hypothesis / aims of study

- The thinnest transurethral catheter compliant with international guidelines for good urodynamic practices is the 6F dual lumen.
- Although widely used, no consensus exists in the published literature regarding its impact on urinary flow parameters.
- Multiple other parameters including underlying patient pathology, voided volumes, position of void and patient inhibition may also affect flow rate

Study design, materials and methods

- A prospectively collected database of video-urodynamic (VUDS) tests performed with a 6Ch dual lumen urethral catheter in a tertiary centre between 2016-2018 was screened for adult patients who voided a minimum of 150ml on free flow immediately before their VUDS. Data including demographics, position of voiding, free flow and video urodynamics parameters were collected.
- Participants were categorised according to their VUDS results into 4 groups:
 - 1) normal pressure, normal flow void (N)
 - 2) detrusor underactivity (DU)
 - 3) bladder outlet obstruction (BOO)
 - 4) impaired detrusor contraction with associated obstruction (DU/BOO).
- Patients who voided off detrusor overactivity (DO), had non-diagnostic VUDS or incomplete data were excluded.
- Paired samples t test and One-way ANOVA were used and statistical significance was determined as $p < 0.05$.

Results

- 413 patients met the inclusion criteria.
- 39 (9.4%) were excluded as they did not have a representative void during their VUDS due to inhibition (36) or catheter related pain (3).
- further 19 (4.6%) excluded, as they were unable to void with the catheter in situ.
- 355 patients analysed - 221 women and 134 men, mean age 52 ± 15 y
- Overall, significantly higher mean Qmax on free flow 21.7 ± 10.9 ml/s compared to Qmax= 14.9 ± 8.3 ml/s with the 6F catheter in situ ($p < 0.001$)

Video-urodynamic outcome	Mean free flow Qmax (SD)	Mean catheterised Qmax (SD)	Number of patients (p value)	Mean free flow Qmax (SD)	Mean catheterised Qmax (SD)	Number of patients (p value)
	Women			Men		
Normal pressure, normal flow void (N)	28.4ml/s ± 11.8	20.8ml/s ± 8.1	112 $p < 0.001$	22.7ml/s ± 8.7	16.2ml/s ± 6.2	50 $p < 0.001$
Bladder outlet obstruction (BOO)	16.4ml/s ± 8.3	9.8ml/s ± 4.4	63 $p < 0.001$	16ml/s ± 8.5	8.4ml/s ± 3.8	54 $p < 0.001$
Detrusor underactivity (DU)	21.1ml/s ± 9.5	14.8ml/s ± 7.8	40 $p < 0.001$	19.4ml/s ± 8.8	14.6ml/s ± 9.2	27 $p < 0.001$
Impaired detrusor contraction with associated obstruction	12.2ml/s ± 4.1	9.5ml/s $\pm 4/2$	6 $P = 0.364$	10.7ml/s ± 1.7	9.3 ml/s ± 0.6	3 $p = 0.401$
p value (One-way ANOVA)	<0.001	<0.001		0.001	<0.001	

Interpretation of Results

- The 6F catheter significantly influences urinary flow and might lead to inability to void in 5%. Overall, it led to Qmax reduction of 32% compared to the free flow. Statistically significant differences were noted 3 of the 4 patient groups: normal pressure, normal flow void, detrusor underactivity (DU) and bladder outlet obstruction (BOO). The p value for the impaired detrusor contraction with associated obstruction group was 0.401, but only 3 patients were identified.

Conclusion

- Free flow remains an essential component of urodynamic investigations.