

# Female urinary retention



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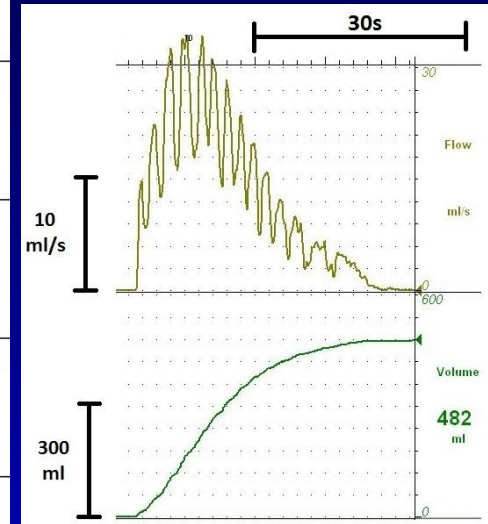
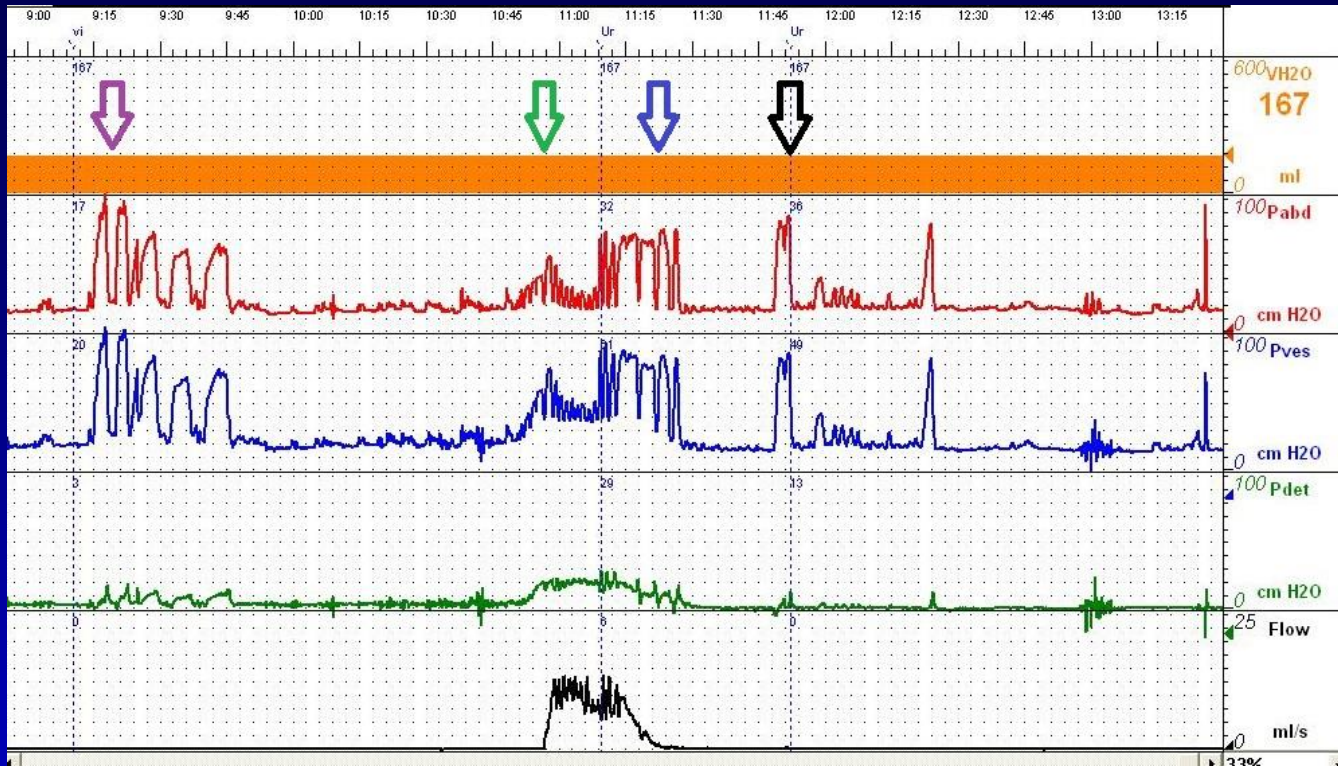
# Summary

- Retention; AUR vs PVR
  - Contractility; straining to augment, poor voiding dynamic
  - Female outlet obstruction is a varied group
- Anatomical and functional causes
- Fowler's syndrome



- Underactive contraction
- Bladder outlet obstruction
  - Anatomical; post surgical
  - Functional: Fowler's syndrome

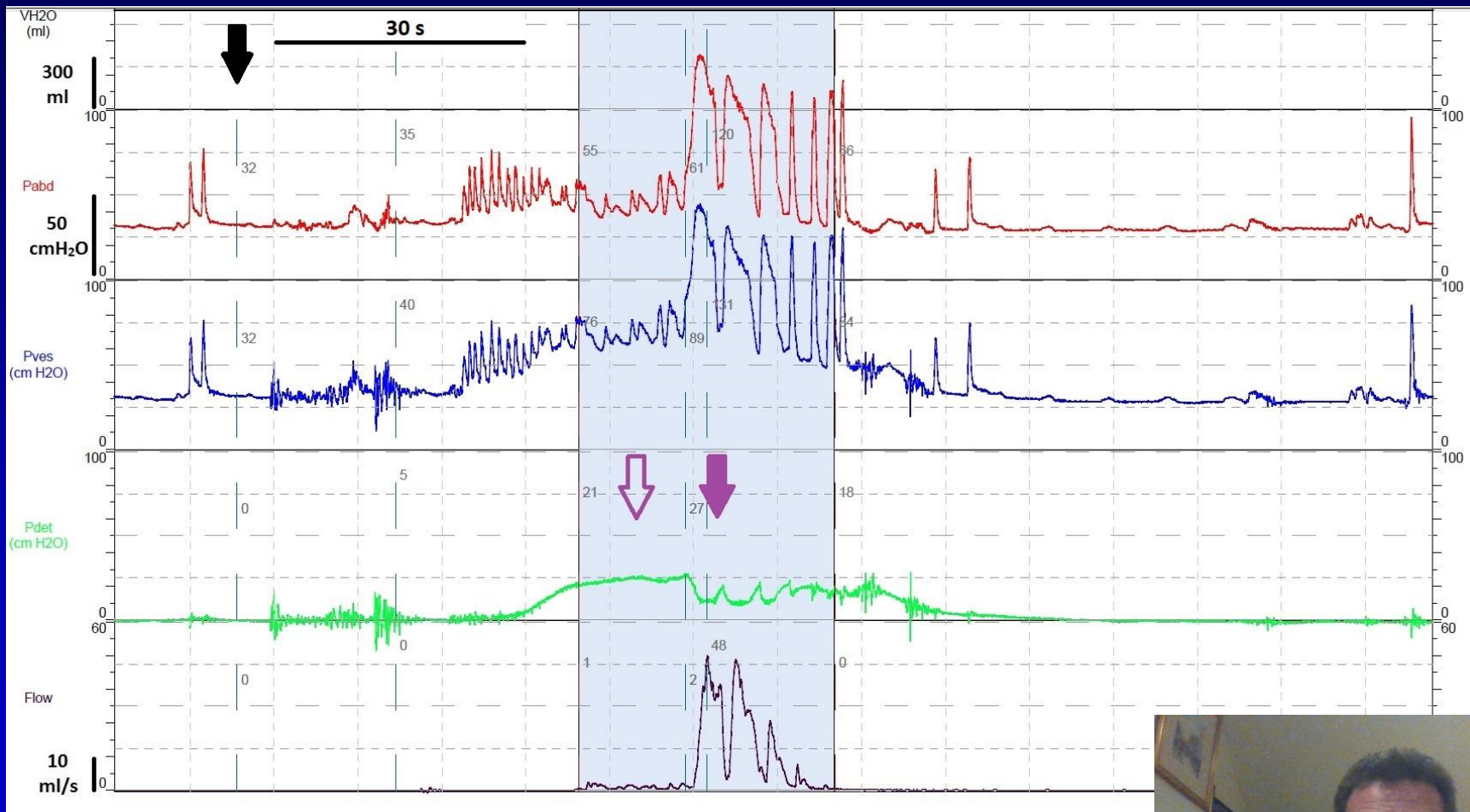




Pressure-flow study (left) illustrating how straining may be done to initiate voiding (purple arrow), increase the rate of flow (green arrow), perpetuate voiding (blue arrow), or in an attempt to complete emptying (black arrow).





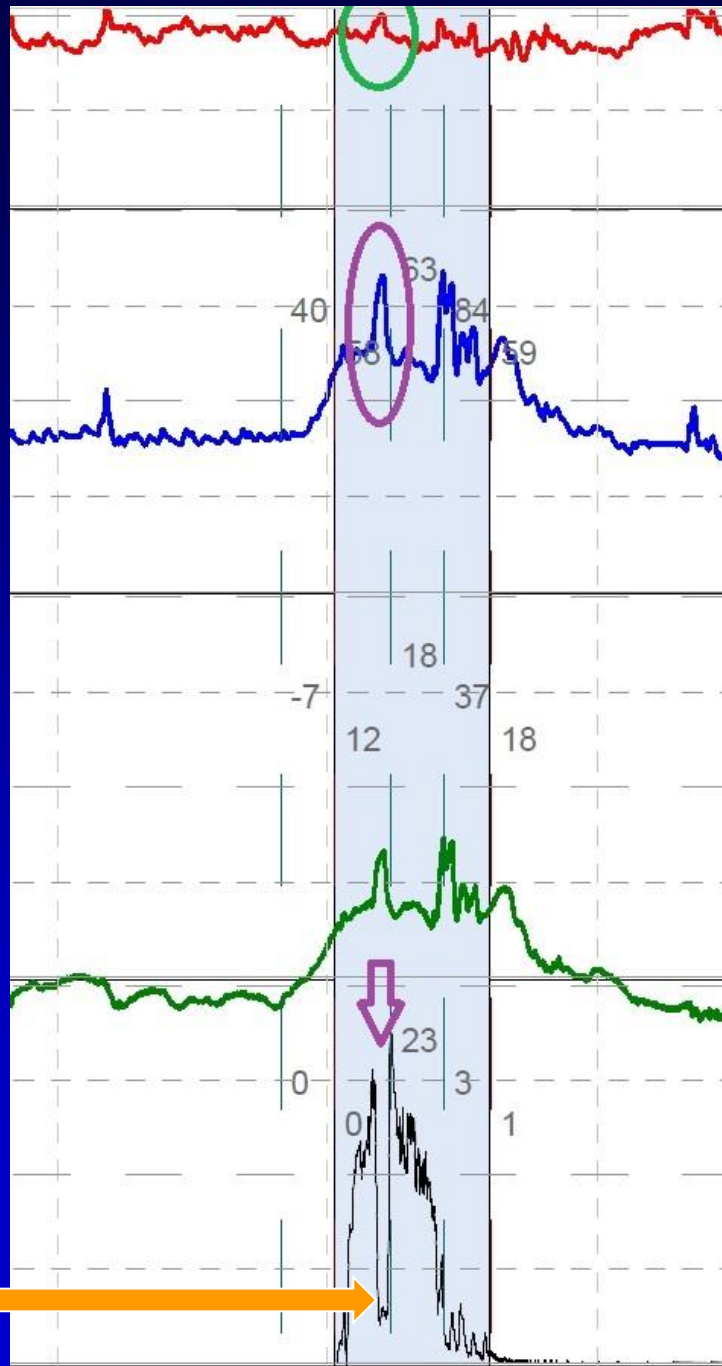


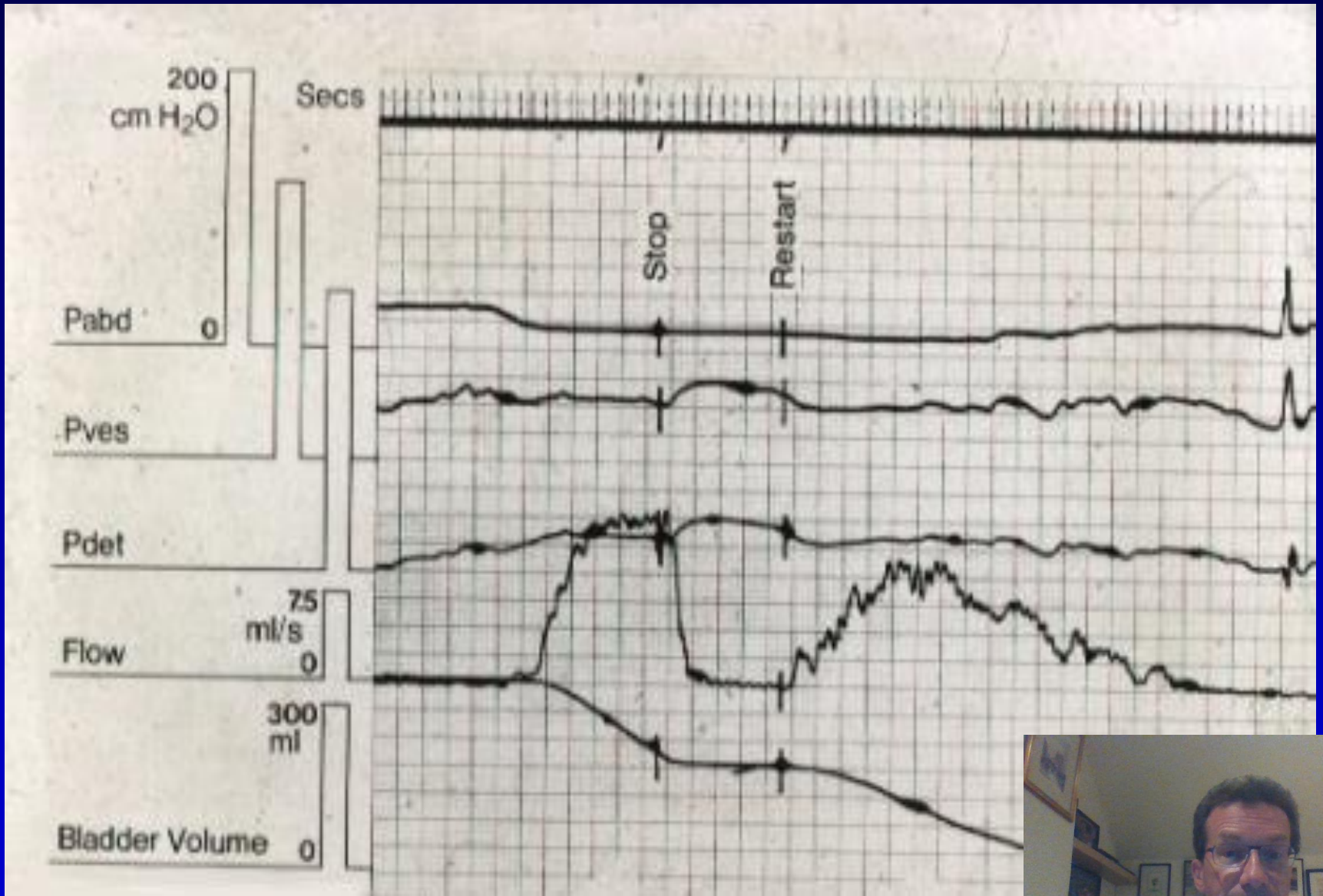
Permission to void is indicated by the black arrow. She did have a detrusor contraction (open purple arrow), but this generated minimal flow, so she supplemented it with straining (closed purple arrow), which did achieve flow sufficient to enable emptying with only a small post void residual.



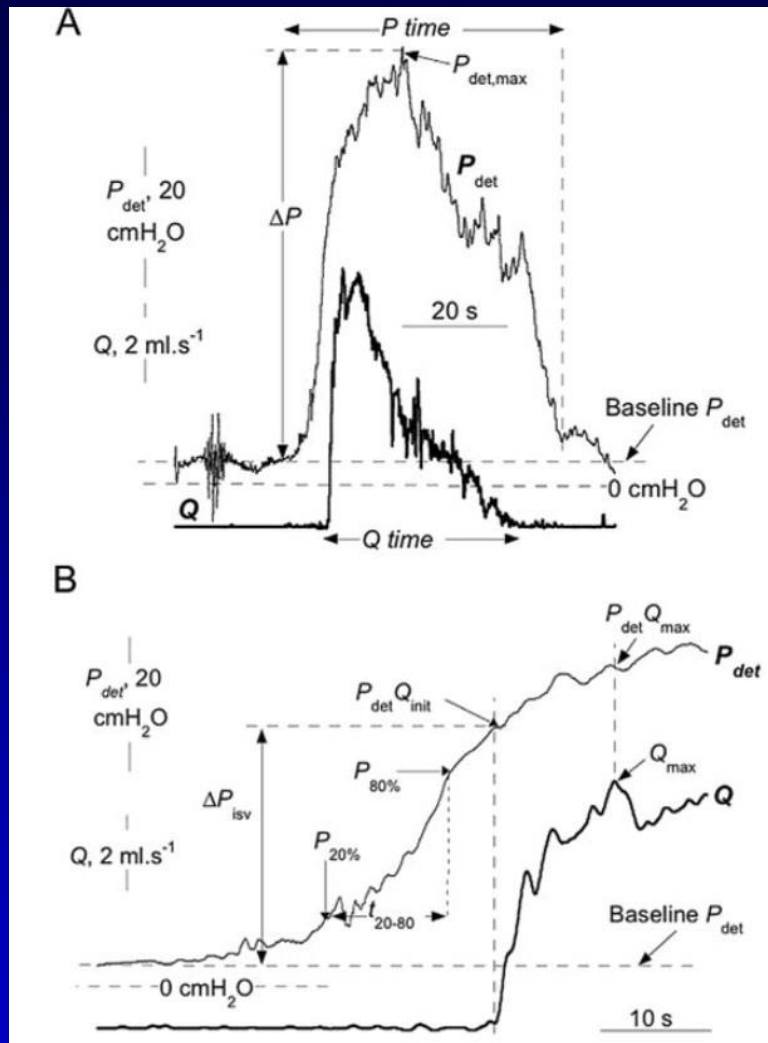
A “**stop test**” to assess detrusor contractility. The patient attempted to interrupt flow (purple arrow), and this caused a sharp increase in vesical pressure (purple oval). The green oval shows the pelvic floor contraction needed to interrupt flow.

She tried, but she did not manage to interrupt flow completely





Certificate  
of UDS



The t20-80 approach to estimating detrusor contractility; urodynamic recordings of detrusor pressure ( $p_{det}$ ) and flow ( $Q$ ), from which variables were measured. (A) recordings over the time-frame of an entire bladder contraction defining values of the isovolumetric pressure change and flow time. (B) faster time scale of the rise of the  $p_{det}$ -transient, from which the 20–80% isovolumetric pressure time is calculated. Fry C. et al. *Neurourol Urodyn* 2017; 36: 1009- 14





# Bladder outlet obstruction

- Men;
  - BOO is common, diagnostic criteria are agreed, epidemiology of acute retention is known
- Women
  - BOO is rare and diverse, diagnosis not agreed, epidemiology not known
  - Varied voiding dynamics
  - Treatment outcome uncertain



# Anatomical basis of BOO

Occlusion

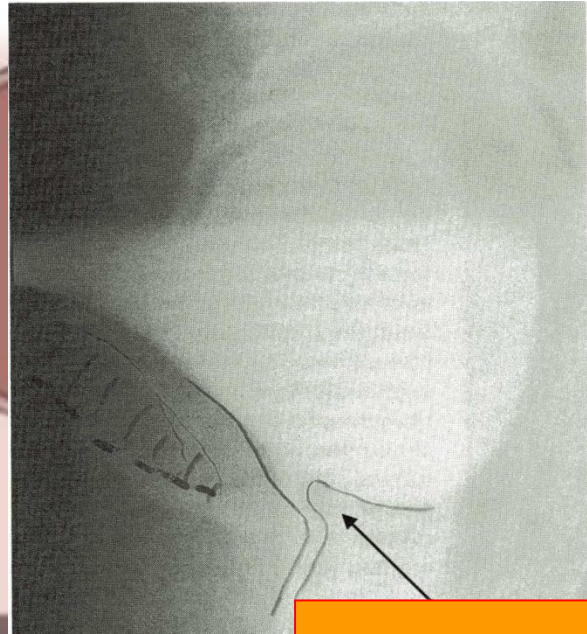
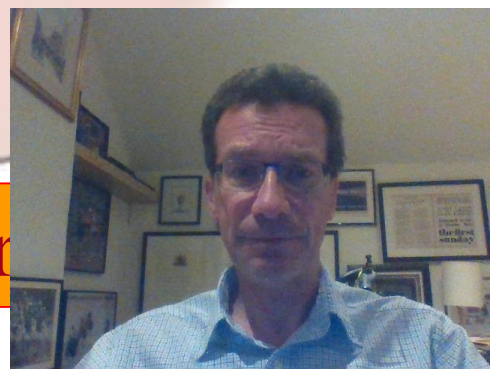


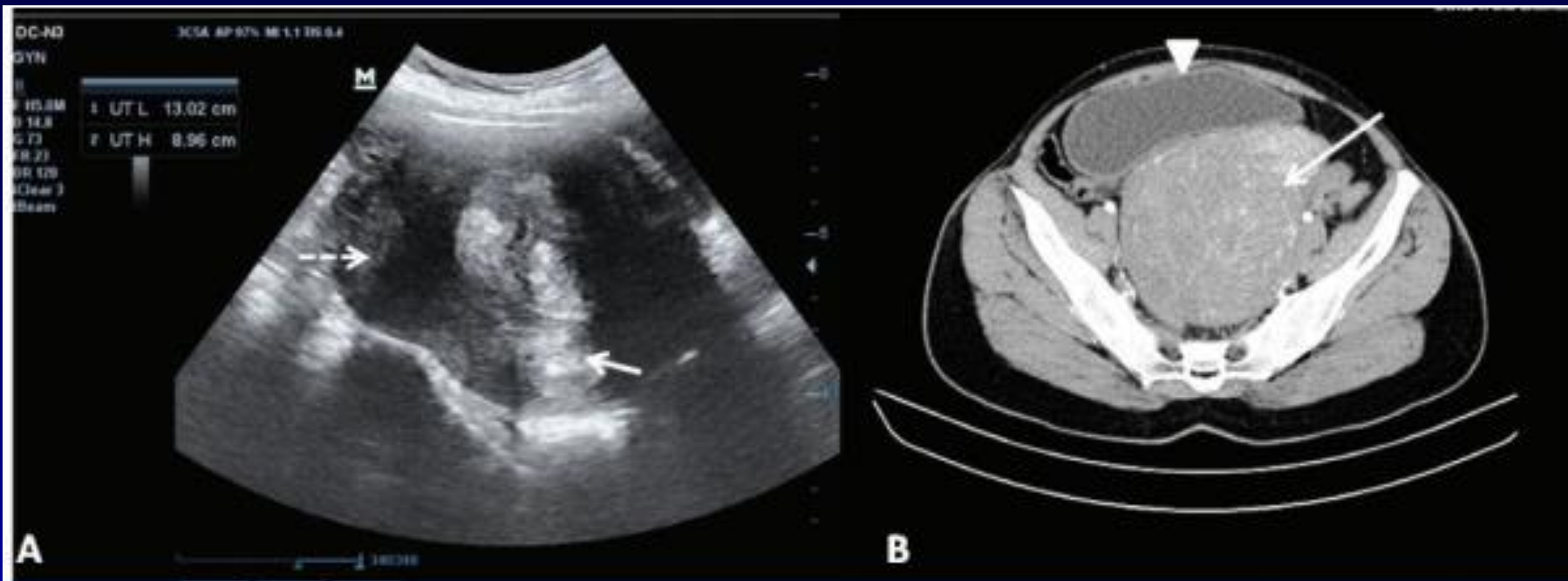
FIG. 4.  
An obstruction from a sling placed under tension in the proximal urethra. The urethral axis is kinked with a negative angle proximally. The patient had to void standing and leaning forward with straining to facilitate better emptying.

Distortion



Compression



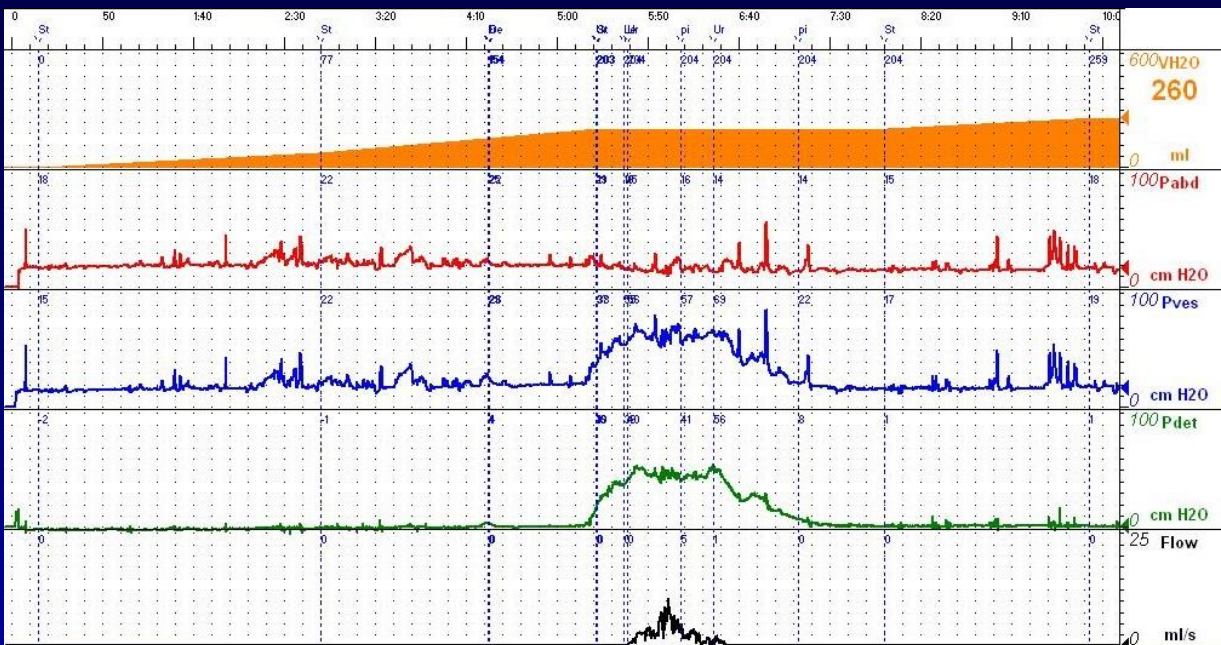


**[Table/Fig-4]:** a) Trans abdominal ultrasonography showing large cervical fibroid (arrow) measuring 9.3 X 9.2 cm with normal sized uterus (dashed arrow) seen on top and b) CECT- large homogeneously enhancing solid myoma mass (arrow) measuring 11 X 10.5 cm seen posterior to the bladder (arrow head).

*Singh S et al. Uterine Fibroid (Leiomyoma) with A Retention: A Case Series. J Clin Diagn Res. 2016;*







*DO incontinence after TVT;  
 recurrent incontinence and  
 voiding difficulty. The filling  
 cystometry aboveshow shows DO  
 incontinence. Pressure flow  
 study below shows detrusor  
 contraction with straining.*





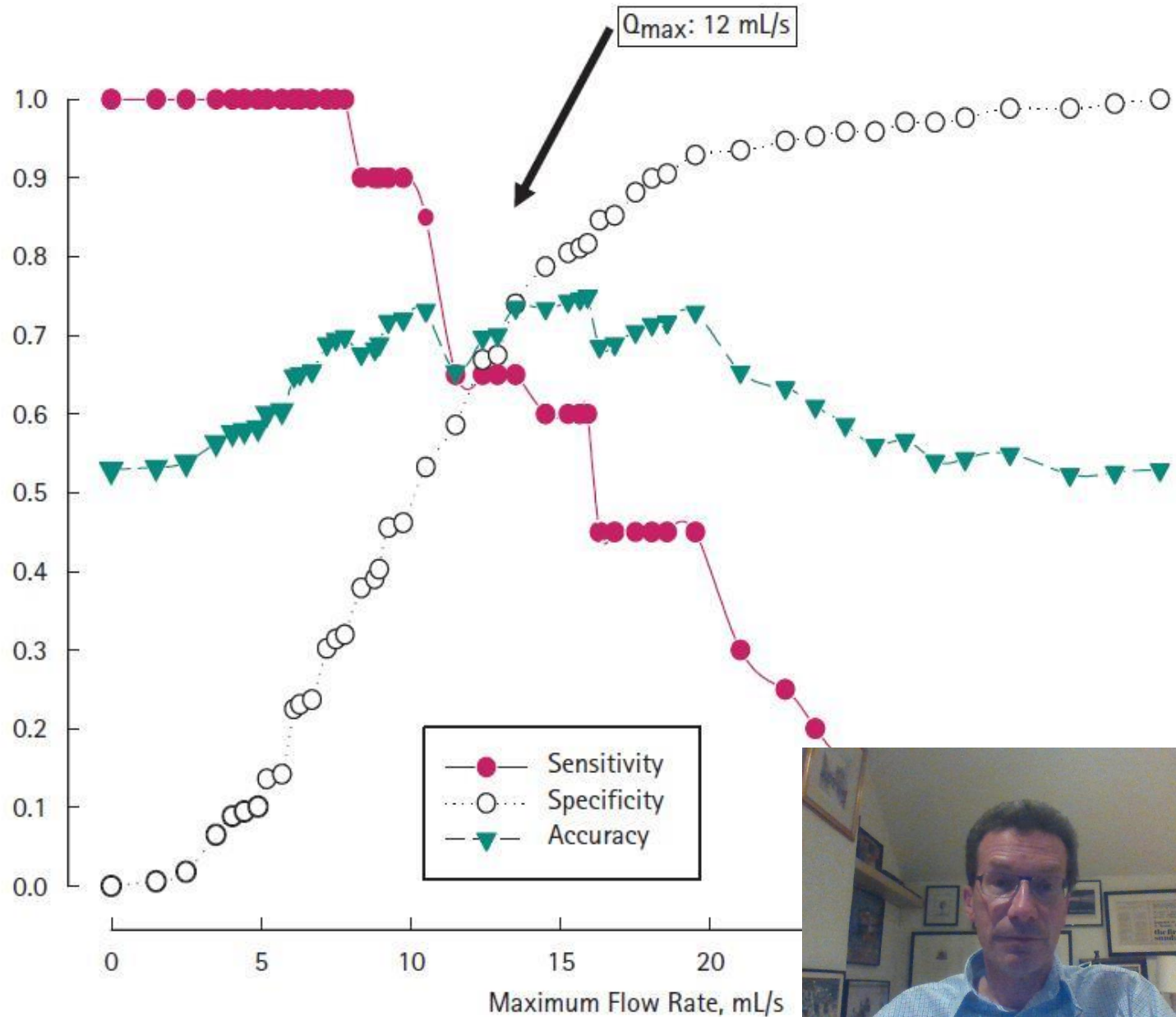
# Causes of female BOO

- ANATOMICAL
- Gynae; POP, fibroids
- Post surgical
- Urethral stenosis/  
diverticulum/ cyst
- Ureterocoele
- Foreign body
- FUNCTIONAL
- (Bladder neck  
obstruction)
- Pseudodyssynergia
- Neurological
- Fowler's syndrome



$P_{det} \geq 25 \text{ cm H}_2\text{O}$   
 $Q_{max} \leq 12 \text{ mL/s}$

FIG. 5. Threshold pressure-flow criteria indicating that the combination of a flow at  $\leq 12 \text{ mL/s}$  for a detrusor pressure of  $\geq 25 \text{ cmH}_2\text{O}$  offers the highest sensitivity and specificity for B00. Adapted from Defreitas et al. [8].



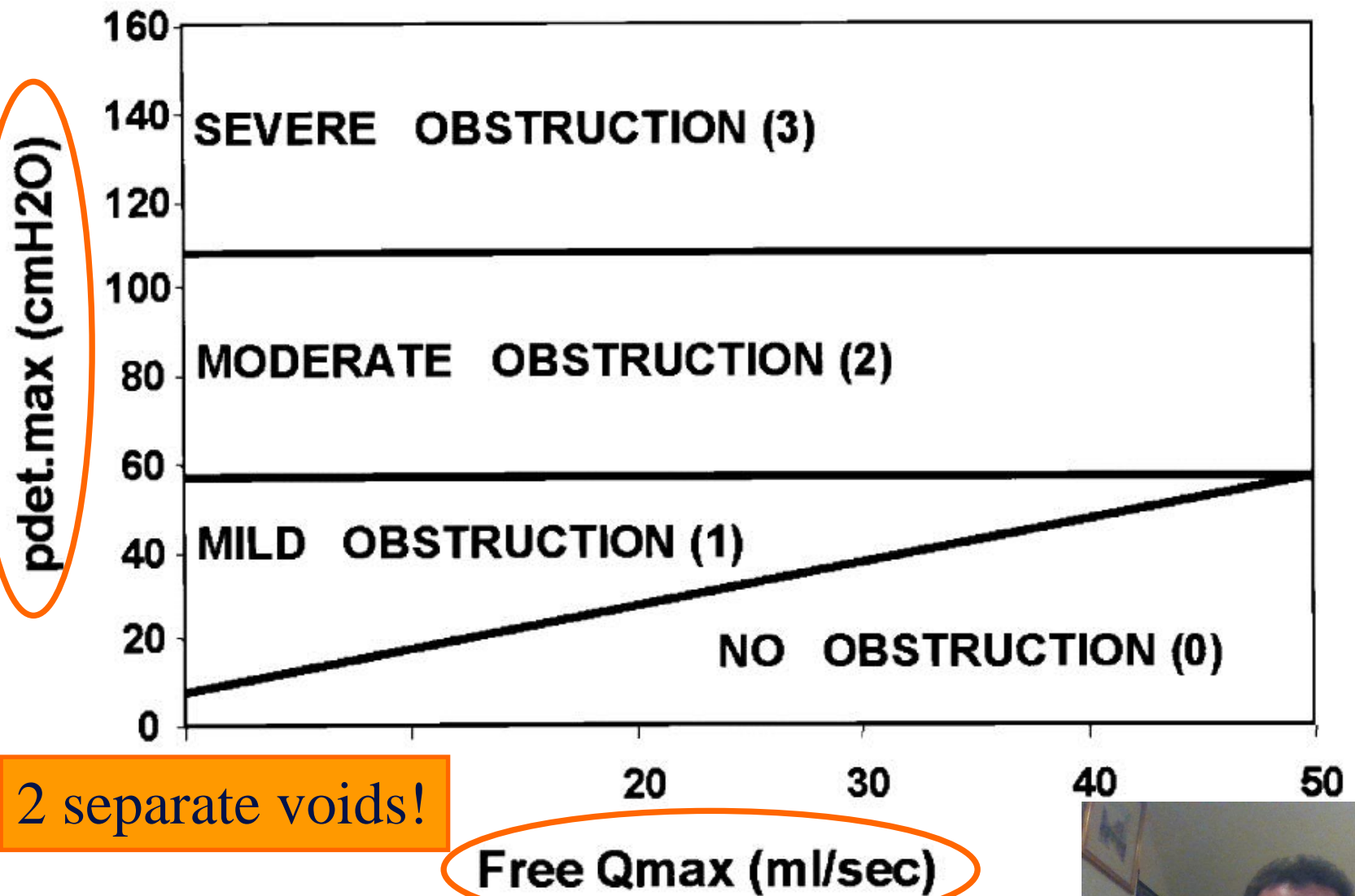
# Blaiivas & Groutz nomogram

- Blaiivas and Groutz, N&U 2000
- 50 women of 600 consecutive UDS studies defined as obstructed on clinical grounds

**TABLE II. Etiologies of Bladder Outlet Obstruction Among the Obstructed Women**

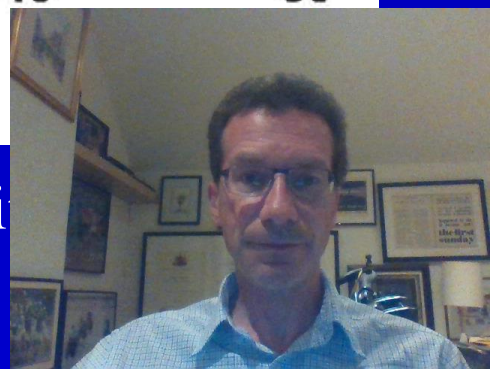
| Etiology                                | Bladder outlet obstruction |    |
|---|----------------------------|----|
|   | No.                        | %  |
| Previous anti-incontinence surgery      | 10                         | 20 |
| Severe genital prolapse                 | 8                          | 16 |
| Severe prolapse and previous surgery    | 2                          | 4  |
| Urethral stricture or narrowing         | 9                          |    |
| Primary bladder neck obstruction        | 3                          |    |
| Urethral diverticulum                   | 3                          |    |
| Learned voiding dysfunction             | 2                          |    |
| Detrusor-external sphincter dyssynergia | 2                          |    |
| Idiopathic                              | 11                         |    |
| Total                                   | 50                         |    |





2 separate voids!

May underestimate BOO severity if poor contractility





# Chassange criteria

- Chassange et al. (Urology 1998). Compared anatomical BOO vs women with SUI

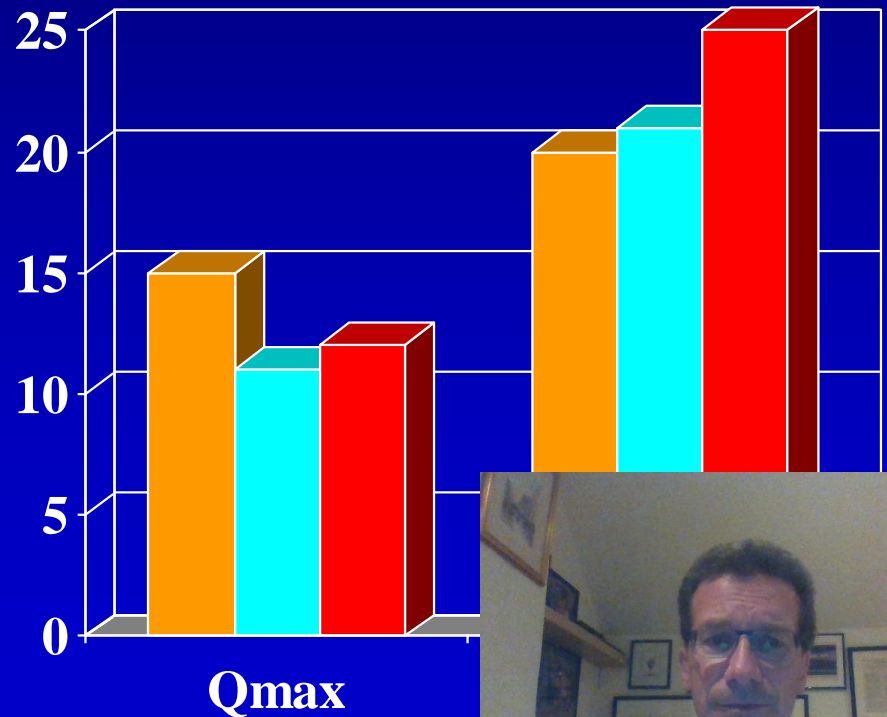
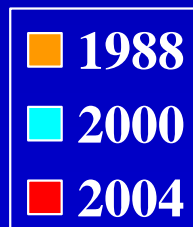
*$Q_{max} < 15 \text{ ml/s plus}$*

*$P_{det}Q_{max} > 20 \text{ cm H}_2\text{O}$*

*gives sens 74%, spec 91%*

- Revised 2000/ 2004

– prevalence 20%



# Comparison of diagnostic criteria

- 91 evaluable patients
  - Obstruction suspected clinically in 25 women, analysed using the various criteria
- BOO diagnosed by at least 1 method in 40
  - 9 obstructed on all criteria, 9 on only 1 criterion
  - Blaivas/ Groutz nomogram diagnosed most, 2004 criteria underestimated BOO
  - Best concordance between 1998 & V

*Akikwala et al. J Urol 2006*



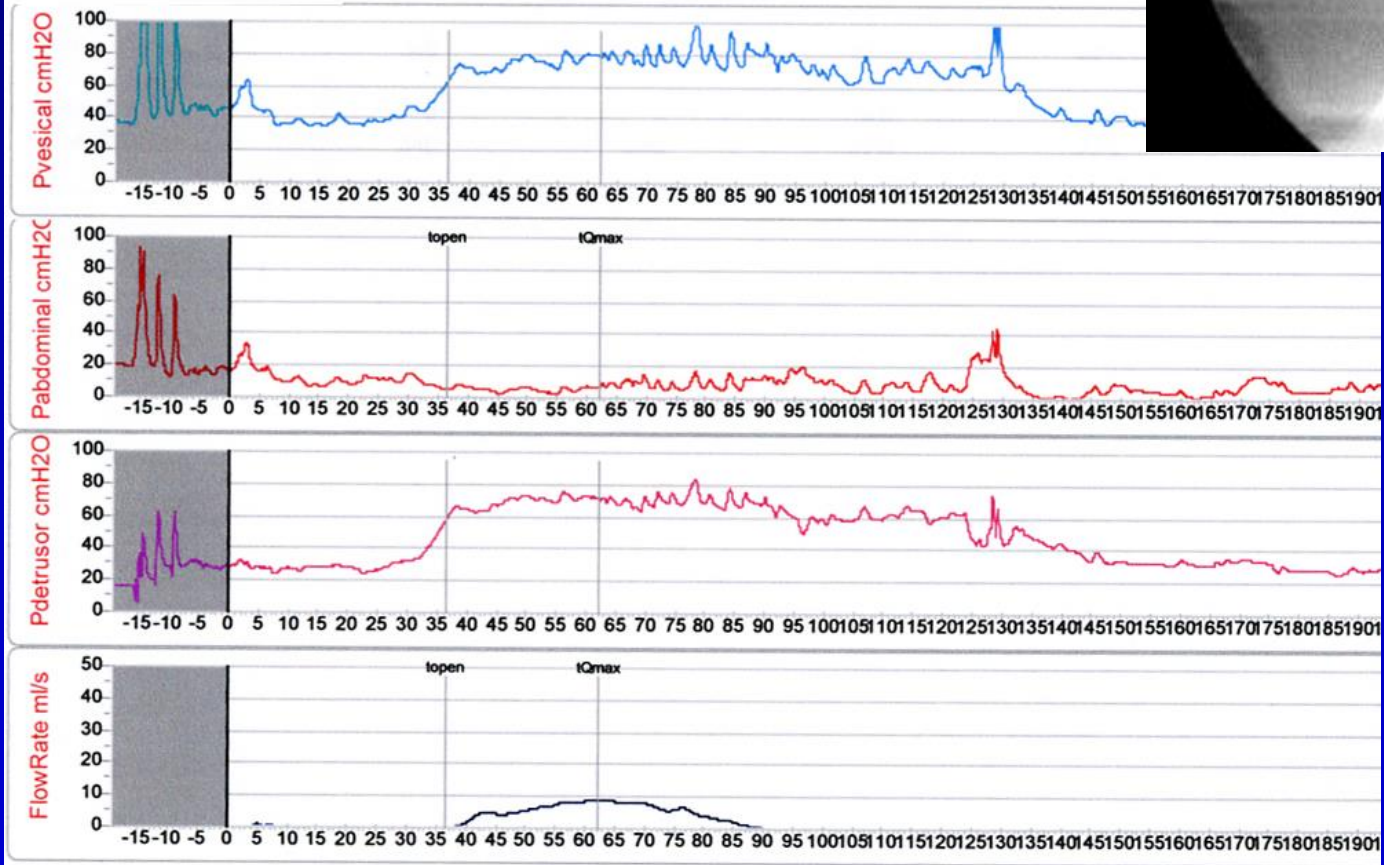
# After midurethral sling...

- Many have partial retention early post op
  - Anaesthesia, analgesia, discomfort, oedema, haematoma
  - Altered voiding dynamics
- Must be reviewed early to check resolution; most improve and do well
- Complete retention needs close man





## Flow Cystometry





# Causes of female BOO

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# Abnormal electromyographic activity of the urethral sphincter, voiding dysfunction, and polycystic ovaries: A new syndrome?

Clare J Fowler, Timothy J Christmas, Christopher R Chapple, Helen Fitzmaurice Parkhouse, Roger S Kirby, Howard S Jacobs

BMJ VOLUME 297 3 DECEMBER 1988

## Abstract

A potential association between abnormal electromyographic activity—that is, decelerating bursts and complex repetitive discharges—of the urethral sphincter and difficulty in voiding was examined in 57 women with urinary retention. Abnormal electromyographic activity was found in 33. Ultrasonography of the ovaries in 22 of the 33 women showed that 14 had polycystic ovaries. Of the other eight women, two had had oophorectomies, one had shrunken ovaries and ovarian failure, and one had previously undergone oophorectomy and the other ovary could not be seen; in one neither ovary could be seen, and three had ovaries of normal appearance, although two of these women were taking the contraceptive pill. Thirteen of the group had endocrine symptoms and signs characteristic of the polycystic ovary syndrome. Videocystometry in 17 of the women who were examined by ultrasonography showed low flow rates and high residual volumes of urine after micturition in 12 women who could void, the other five having chronic urinary retention.

A speculative hypothesis for the observed association of impaired voiding, abnormal electromyographic activity of the urinary sphincter, and polycystic ovaries is advanced, based on the relative progesterone deficiency that characterises the polycystic ovary syndrome. Progesterone stabilises membranes, and its depletion might permit ephaptic transmission of impulses between muscle fibres in the muscle of the urethral sphincter, giving rise to the abnormal electromyographic activity. This may impair relaxation of the sphincter, resulting in low flow rates of urine, incomplete emptying of the bladder, and, finally, urinary retention.

than normal ovaries (mean volume 5.8 ml (4.6 to 7.3)), with a highly echogenic and dense central stroma and numerous (>10) peripherally located cysts of 4-6 mm in diameter.<sup>7</sup> When associated with hirsutism, greasy skin, obesity, menstrual irregularity, and infertility the polycystic ovary syndrome may be the diagnosis.<sup>8</sup> This condition is associated with increased concentrations of circulating androgens and luteinising hormone (with normal concentrations of follicle stimulating hormone) and, in 30% of cases, hyperprolactinaemia<sup>9</sup> and occurs in 25% of women with amenorrhoea and 90% of those with hirsutism.<sup>8</sup>

## Patients and methods

Fifty seven women with difficulties in voiding were referred to the department of clinical neurophysiology at the Middlesex Hospital during 1982-8 for electromyography of the urethral sphincter. The indication was retention of urine or dysfunction of voiding. The referring doctors were aware of our interest in the electromyographic abnormality,<sup>1</sup> and patients were clearly selected.

Each patient underwent electromyography of the urethral sphincter with a concentric needle electrode,<sup>10</sup> and abnormal electromyographic activity (that is, decelerating bursts and complex repetitive discharges) was found in 33 (57%). The study was carried out in 22 of these women (who had been early subscribers to the journal, but from long distances could not be contacted, and whose records were not available). Ultrasonography of the ovaries by two experienced radiologists using a high resolution transducer at a resolution resolution resolution resolution resolution or menstrual irregularity, hirsutism or acne were



# Fowler's syndrome

- Young women
  - post menarche
  - Polycystic ovary 40%
- High volume painless retention
- Difficulty with ISC, especially removal
- Apparently unconnected precipitating event
- All investigations normal, including
- Not taking drugs, particularly opiates

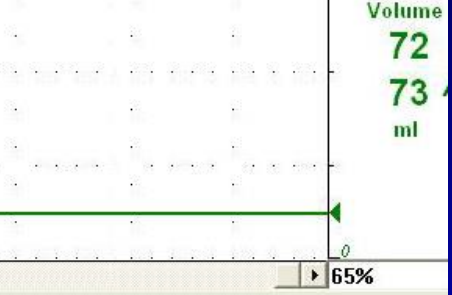
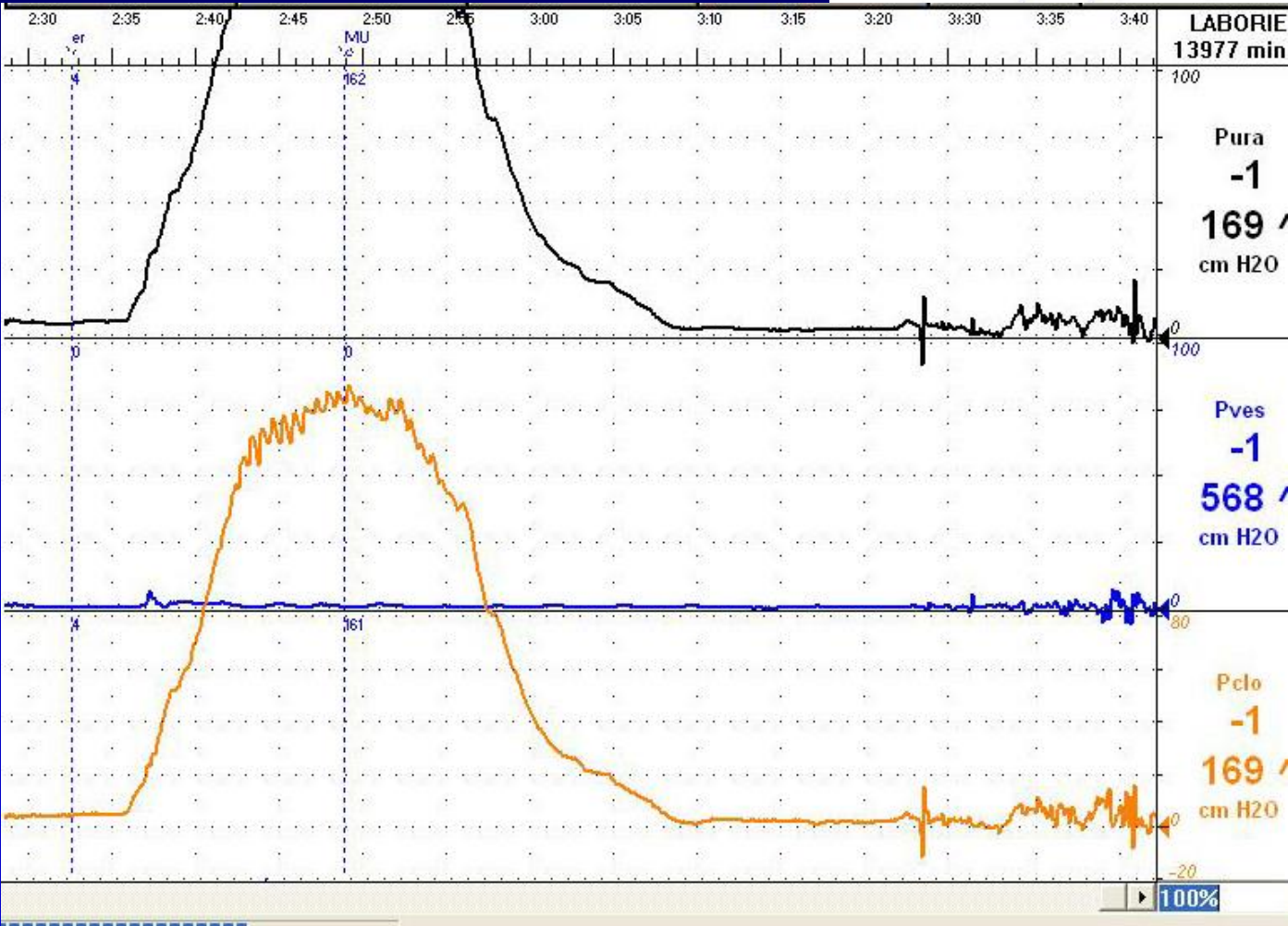
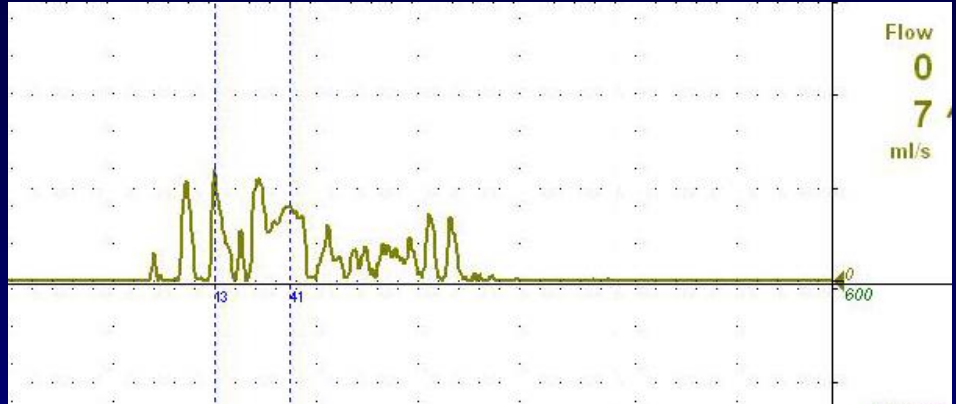


# Diagnosis

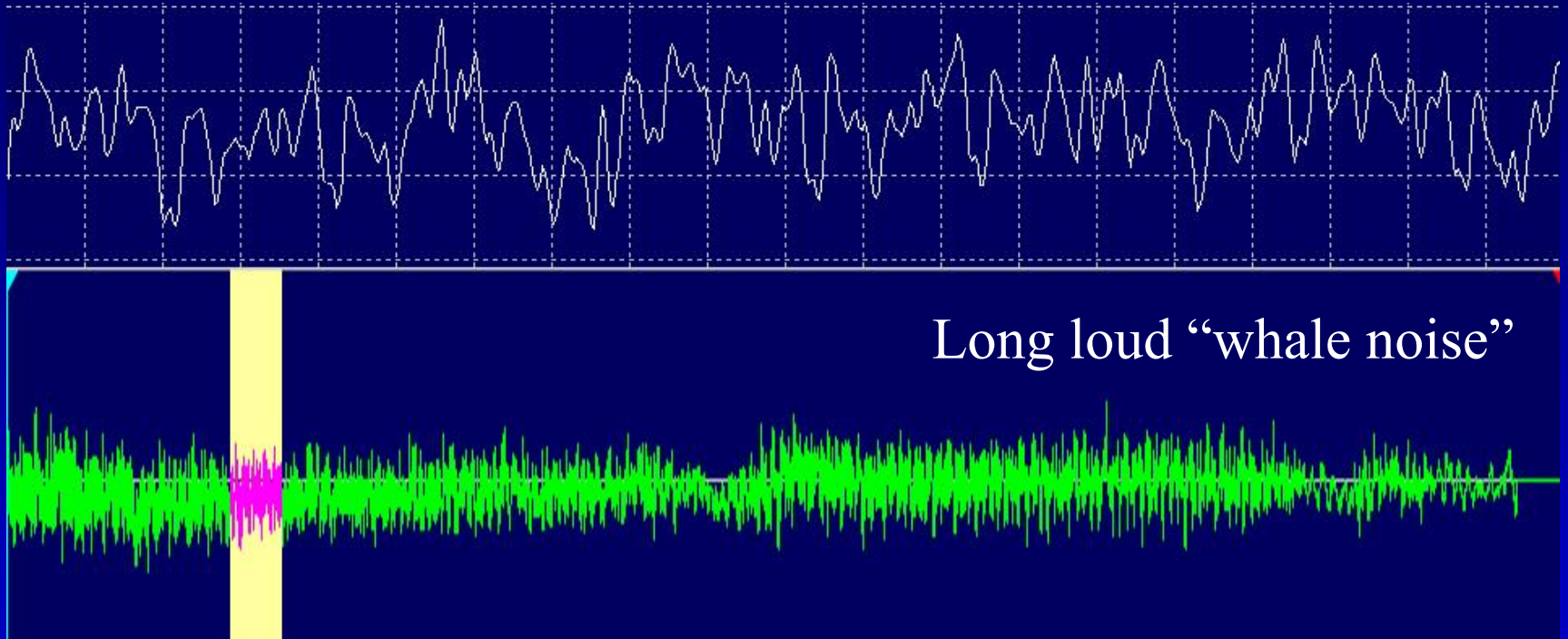
- History
  - Painless retention  $>1L$  on at least 1 occasion ←
  - Problems with ISC- especially on withdrawal
- Raised maximum urethral closure pressure/  
sphincter volume (*Wiseman et al. J Urol 2002*)
- Characteristic sphincter (not PF) EMG ←







# EMG



- May be due to ephaptic transmission to skeletal muscle



# Treatment of Fowler's syndrome

- Stop all opioid analgesic drugs
- No established drug treatment
  - Alpha-1 antagonists and viagra poor outcome
  - PDE4 inhibitor theoretical potential
- Self catheterisation very poorly tolerated;  
Mitrofanoff procedure
- Sacral nerve stimulation



# SNS in Fowler's syndrome

- FDA/ NICE supported
- Some patients show marked improvement
- Physiological mechanisms unclear
- Cost
- Patient selection





# Long term outcome of SNS

- 5 year data from 17 centres; 31 patients
- ISC fell from 5.3 (+/- 2.8) to 1.9 (+/- 2.8)
  - Reduced mean catheterised volume
- At 5 years clinical success rate 58% (at least 50% reduction in symptoms)
  - 78% of people responding at 1 year were still responding at 5 years

Van Kerrebroeck et al. J Urol 2007; 178: 2029



# Conclusions

- Retention; AUR vs PVR
  - Contractility; straining to augment, poor voiding dynamic
  - Female outlet obstruction is a varied group
- Anatomical and functional causes
- Post surgical retention; examination findings can guide suitable intervention
- Fowler's syndrome

