POST FISTULA URINARY INCONTINENCE

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URINARY INCONTINENCE

- Involuntary loss of urine experienced during the bladder storage phase
  - ICS

URINARY INCONTINENCE EXCLUDING FISTULA

- Overactive bladder
- Stress urinary incontinence
- Mixed urinary incontinence
- Overflow incontinence
- Others e.g. cognitive dysfunction

LOWER URINARY TRACT SYMPTOMS – ICS DEFINITIONS

- Overactive bladder (OAB)
  - Urinary urgency, usually accompanied by increased daytime frequency and/or nocturia, with urinary incontinence (OAB-wet) or without (OAB-dry), in the absence of urinary tract infection or other detectable diseases
- Stress urinary incontinence (SUI)
  - Complaint of involuntary loss of urine on effort or physical exertion including sporting activities, or on sneezing or coughing
- Mixed urinary incontinence (MUI)
  - Complaints of both stress and urgency urinary incontinence

URINARY INCONTINENCE

- Systematic reviews – wide range of incontinence rates
  - World-wide UUI – up to 1/3 women (Milsom 2014)
  - MUI 1/3 women (Manssian 2003)
  - Sub-saharan Africa (Whiting, Pope et al 2022)
    - Wide variation e.g. 0.6% in Sierra Leone to 42.1% in Tanzania
    - Uganda SUI and UUI 27%

URODYNAMICS INVESTIGATION

- Measurement of all the physiological parameters relevant to the function and any dysfunction of the lower urinary tract
  - Uroflowmetry, post-void residual
  - Cystometry
  - Urethral closure mechanism

URODYNAMICS – ICS DEFINITIONS

- Uroflowmetry
  - Assesses voided volumes, urine flow rate, post-void residual urine
  - Strong dependency of flow rates on voided volume
  - Cultural challenges with equipment
- Cystometry
  - Measurement of the pressure-volume relationship of bladder during filling
  - Assess bladder sensation, bladder capacity, detrusor activity/compliance, urinary leakage
  - Cytometrogram – graphical recording of the bladder pressure(s) and volume(s) over time
    - Detrusor pressure (P_{det}): Subtracting abdominal from intravesical pressure
      - $P_{det} = P_{ves} - P_{abd}$
- Urethral closure mechanism
  - Incompetent: leakage of urine occurs during activities which might raise intra-abdominal pressure in absence of a detrusor contraction

POST-FISTULA URINARY INCONTINENCE

- McConnachie 1958
  - “operative cure is claimed only when cure of the fistula with complete control of urinary function has been achieved”
- Goh 2020
  - “more than a hole in the bladder”

URINARY INCONTINENCE AFTER CLOSURE OF URINARY PFF

- 960 successful fistula (obstetric) closure (Goh J, Browning A et al. Int Urogynecol J 2008)
  - 24% ongoing urinary incontinence at time of discharge from hospital
  - Highest risk – lower fistula i.e. close to external urethral meatus
    - Goh classification Type 1 = 3.2% risk incontinence vs Type 4 = 47.2%
  - Goh classification Type ii & iii (vaginal scarring, circumferential fistula) – increase risk
  - Goh classification a-c (size) – tendency to increasing incontinence with increasing fistula size (p=0.08)

    (Goh J. ANZJOG 2004)

URODYNAMICS FOLLOWING OBSTETRIC FISTULA REPAIR

- Urodynamics 149 women with incontinence after obstetric fistula repair (mean 51 months)
  - 73 (49 %) had urodynamic stress incontinence only
  - 5 (3%) had detrusor overactivity only
  - 64 (43%) had both urodynamic stress incontinence and detrusor overactivity.
  - 7 (5%) of women had neither detrusor overactivity nor urodynamic stress incontinence.
  - 11 (7%) had post-void residual volumes 150 mls or more.
  - Significant urethral sphincter dysfunction
    - 1/3 required paraurethral compression to stop leakage during filling without detrusor rise

(Goh J, Krause H et al. IUJ 2013)

INVESTIGATION OF POST FISTULA URINARY INCONTINENCE

- History
- Examination
  - Exclude fistula recurrence
- Bladder diary
- Residual urine
- Urodynamics if available
  - "simple cystometry"
    - Insert urethral catheter, inflate balloon
    - Connect syringe to catheter and hold vertically about 15 cm above pubic symphysis
    - Fill bladder to about 300 mls
    - Document filling sensations
    - Remove plunger from catheter tip syringe
    - Lower catheter/syringe to note height at which meniscus is seen (vesical pressure)

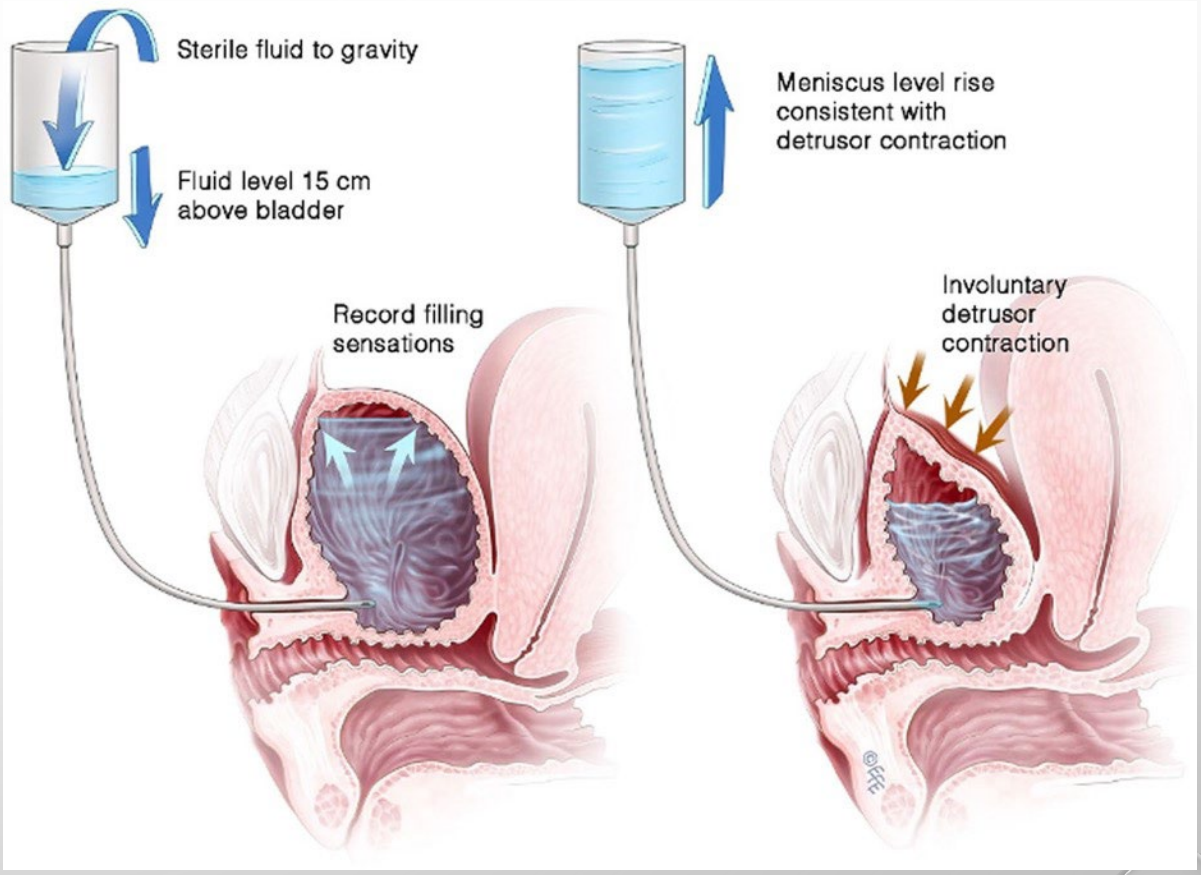


Illustration from: An ICS report on the terminology for pelvic floor fistulas 2020. Elneil, Romanzi, Goh, Haylen et al

MANAGEMENT POST LOWER URINARY TRACT FISTULA URINARY INCONTINENCE

- Conservative management
  - Pelvic floor rehabilitation
  - Lifestyle changes
  - Bladder training
  - Pharmacological agents
  - Urethral plugs (Goh J, Browning A. ANZJOG 2005)
- Surgery
  - "incompetent drain-pipe urethra"
  - Fascial slings
    - +/- retropubic urethrolysis/omental fat-flap (Carey M, Goh J et al. AJOG 2002)
  - Bulking agents (Krause H, Lussy J, Goh J. JOGR 2014)

URINARY STRESS INCONTINENCE PROCEDURES

Ideal pre-operative situation

- Full history
- Initial conservative management
  - Exclude pathology, infection etc
  - Bladder diary
  - Pelvic floor rehabilitation
  - Lifestyle changes – fluids, diet, bowel, weight
- Compliance
- Confirm diagnosis
- Discussion regarding surgical options, risks
- Realistic expectations for outcomes for procedures

IDEAL PATIENT FOR SUI SURGERY

- Ideal patient
  - Urodynamic stress incontinence only
  - Normal uroflowmetry
  - Normal bladder capacity
  - No overactive bladder
  - No previous continence procedures/urethral or bladder neck surgeries
  - Normal BMI
  - No significant medical co-morbidities
  - Complete childbearing

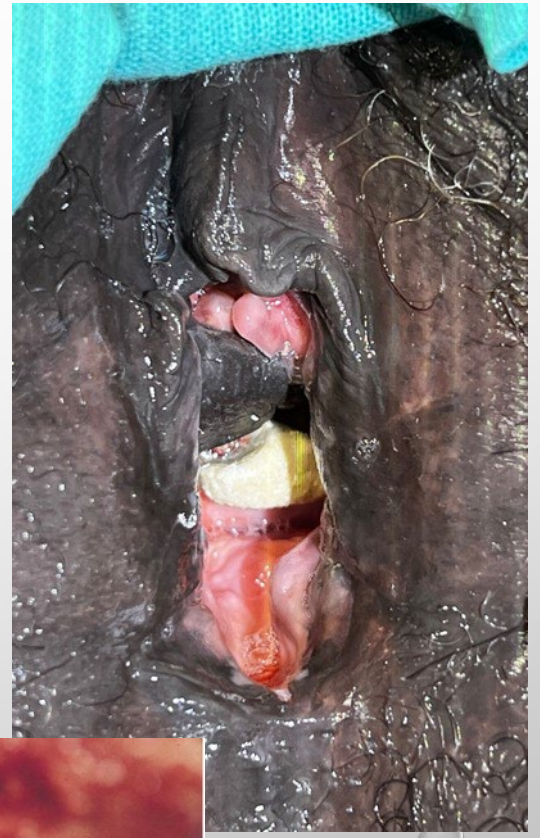
MANAGEMENT INCONTINENCE: "MUSCULAR STRAPS"

- McConnachie 1958
  - "Operative treatment of persisting urinary stress incontinence… formation of a cross-strut muscular sling using the bulbo-cavernosus muscle, levator ani muscle…"

- Browning 2004
  - Similar procedure but performed during fistula closure

MANAGEMENT POST LOWER URINARY TRACT FISTULA URINARY INCONTINENCE: SLINGS

- Acheter-Walsh 2010 (Nigeria)
  - 140 women; 2 months follow up <40% dry
  - Native tissue sling – "substantial urethrolysis and retropubic dissection"
  - Polypropylene mesh – 20% vaginal extrusion rate
  - Iatrogenic fistula 17.3%
- Carey, Goh (2002)
  - 9 cases all had UDs pre-op confirming significant USI
  - Urethrolysis, omental flap, rectus fascial sling
    - 2 cystourethrotomy
  - 14/12 – 67% subjective/objective (UDs) – no SUI
    - 7 women returned for follow up; 1 failure



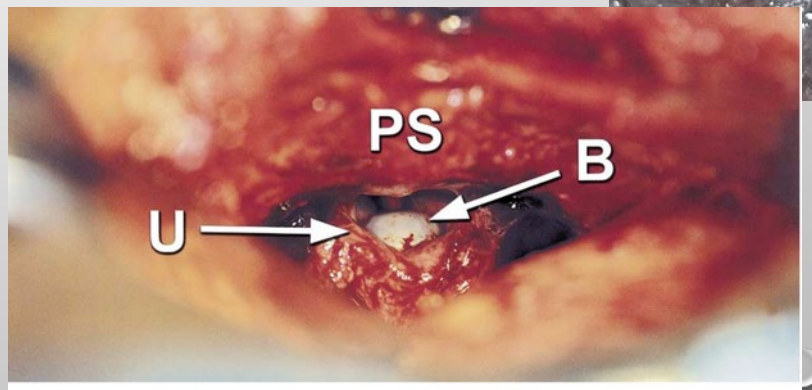


Fig 3. Cystourethrotomy with exposure of the catheter balloon at the bladder neck. *PS*, Pubic symphysis; *U*, urethra; *B*, balloon of urethral catheter.

BULKING AGENTS FOR SUI

- Treat SUI via
  - Coaptation of urethra
- 2 techniques for urethral bulking
  - Transurethral or periurethral
- 2 classes of bulking agents
  - Particulate
    - Solid microparticles in liquid (that is absorbed)
    - Long-term bulking effect via foreign-body/fibrosis reaction forming a capsule/cushion
    - Complications: foreign body granulomas, migration to other body sites, local extrusion/erosion
  - Non particulate
    - Homogenous gel, is not absorbed
    - Host tissue grows into gel which anchors bulking agent in situ

BULKING AGENTS FOR SUI

- 7-year follow up (Brosche 2017)
  - 388 women – 67.1% cured/improved if primary surgery for SUI; 61.5% if not primary
  - Complications – transient voiding dysfunction 15.3%; UTI 3.5%

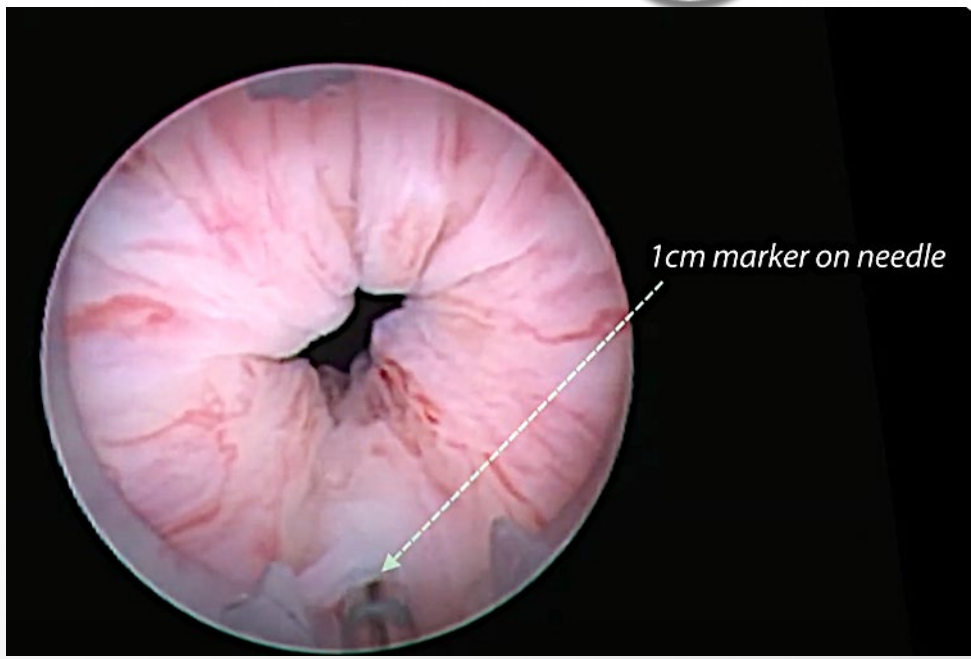
- TVT vs Bulkamid – randomized trial (Freitas 2020)
  - Primary surgery: 224 women, 1-year follow up
  - Negative cough test: 95% TVT; 66.4% Bulkamid
  - Periop complications: TVT 17.1%; Bulkamid 2.6%
    - Reoperation: TVT 5.4%; Bulkamid 0%

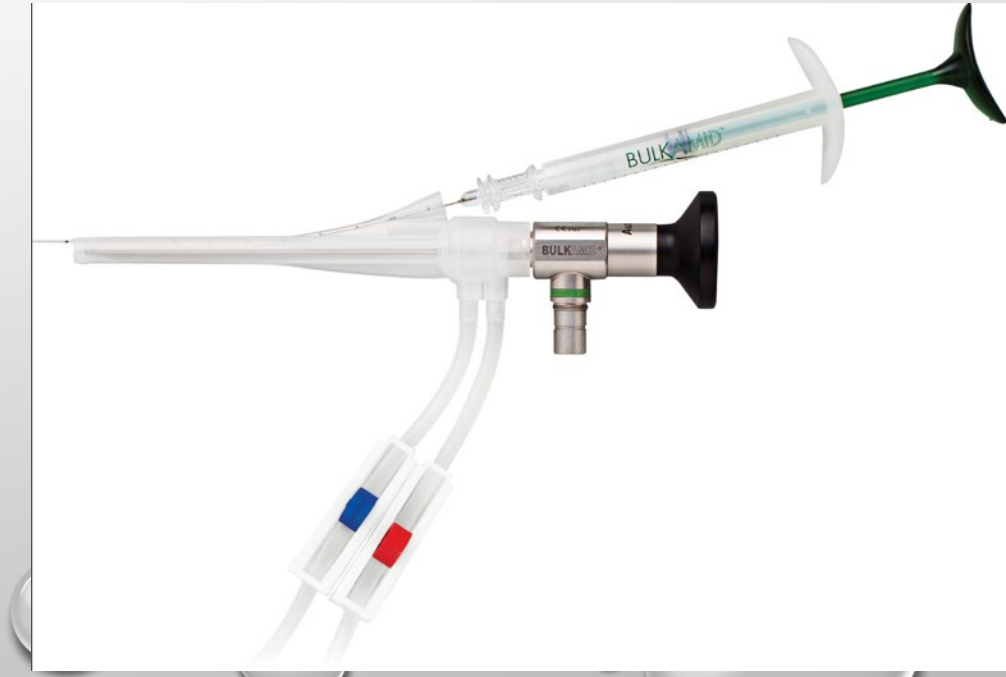
- Bulkamid after radiation therapy for gynaecological cancers (Krhut et al 2016)
  - Significant scarring and poor quality tissue
  - After radioRx – synthetic slings – higher risk of complications – mesh erosion into urethra/vagina
  - 24 women, 12 months follow up
  - No significant complications; 25% completely dry

BULKAMID POST FISTULA

- Usual technique via 0 degree cystoscope
  - Transurethral, bulking agent placed at bladder neck or mid-urethra
- Modified technique as cystoscope not readily available
- Recurrent fistula excluded, simple urodynamics performed

- Periurethral technique
  - Measure urethral length and bladder neck via Foley catheter
  - Insert metal catheter into urethra
    - To determine direction and path of urethra
    - 23G Bulkamid needle inserted into periurethral region at 3 points – each point bulking agent inserted to a total of 1ml



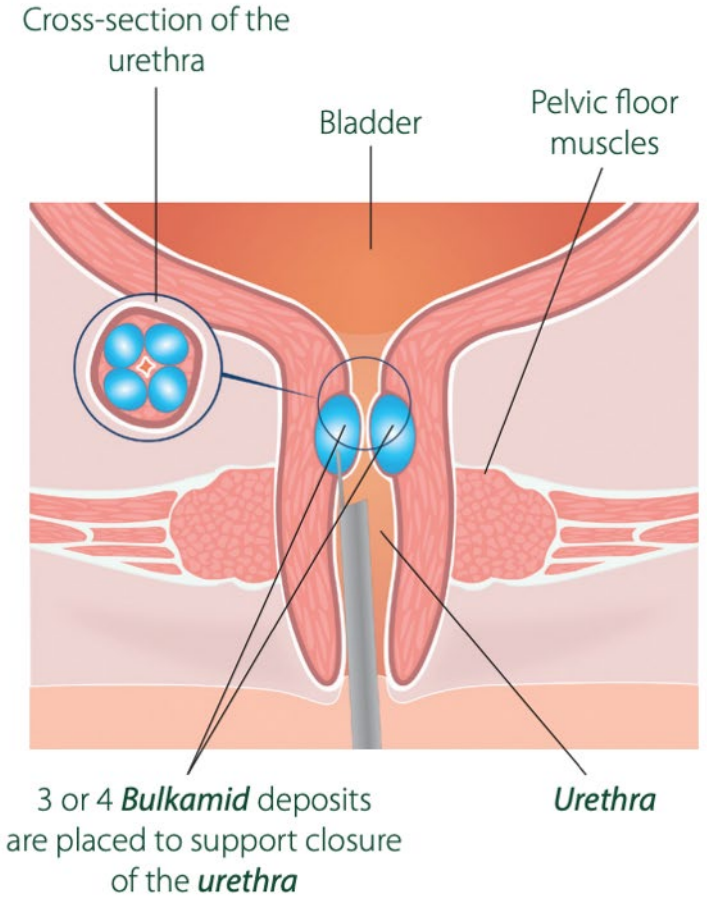


POST FISTULA URETHRAL BULKING AGENT: PROCEDURE

- History, examination
- Simple urodynamics
- Procedure
  - Under sedation/GA
  - Measure length to estimate urethrovesical junction via Foley catheter
  - Path and direction of urethra determined by metal catheter
  - Bulkamid total of 1ml injected via 23G long needle through periurethral skin at 3, 6 and 9 o'clock
    - Leave metal catheter in situ – if needle in urethra, then able to identify it as needle strikes the metal catheter
  - Empty bladder
- "urethral lengthening" procedure in past
  - Not a 'problem' with bulking as performed at bladder neck not 'mid-urethra' (sling)

BULKAMID POST FISTULA

- Krause, Goh 2014
  - DR Congo
  - Modified technique as no cystoscope
  - 4 cases, pre-op examination, simple urodynamics confirms diagnosis, no overactive bladder
    - Between 3-11 previous VVF surgeries
    - At 10-14 days: 3 dry, 1 mild SUI (11 previous repairs)
    - 1 woman – voiding dysfunction D1, then successful TOV
- 20 cases in total
  - 1 failure
  - 1 repeat injection – dry
  - 1 require ongoing oxybutynin – dry
  - 2 transient retention
  - 1 UTI



What is Bulkamid?

Bulkamid is a urethral bulking agent, consisting of 97.5% water and 2.5% polyacrylamide. ***Bulkamid*** is injected into the soft tissue of your ***urethra***. ***Bulkamid*** achieves its bulking effect by the volume of the gel injected.

BULKAMID POST FISTULA

- Why are the women happy with results?
  - Patient selection and counselling
    - "Ideal patient"
    - SUI surgery does not treat and may worsen OAB
    - SUI surgery – higher failure with mixed urinary incontinence
    - Incontinence very severe pre-op, post-op satisfied with improvement
- Advantages
  - Minimally invasive
  - Can be done in women with severe scarring or had "urethral lengthening"
    - Bulking agent at bladder neck, not mid-urethra
- Disadvantage
  - Cost of bulking agent
  - May not be readily available

CONCLUSIONS

- Urinary incontinence after fistula repair
  - History – full urinary symptoms
  - Examination – exclude fistula etc.
  - Bladder diary
  - Urodynamics/simple cystometry
    - Beware voiding dysfunction – surgery may worsen
    - Mixed urinary incontinence – surgery may worsen OAB, and success may be lowered with MUI
  - Patient selection is vital
  - Bulking with nonparticulate agent
    - Good short-term outcomes
    - Require longer term outcomes