Surgical Management of Female Urinary Incontinence in the Elderly

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Objectives

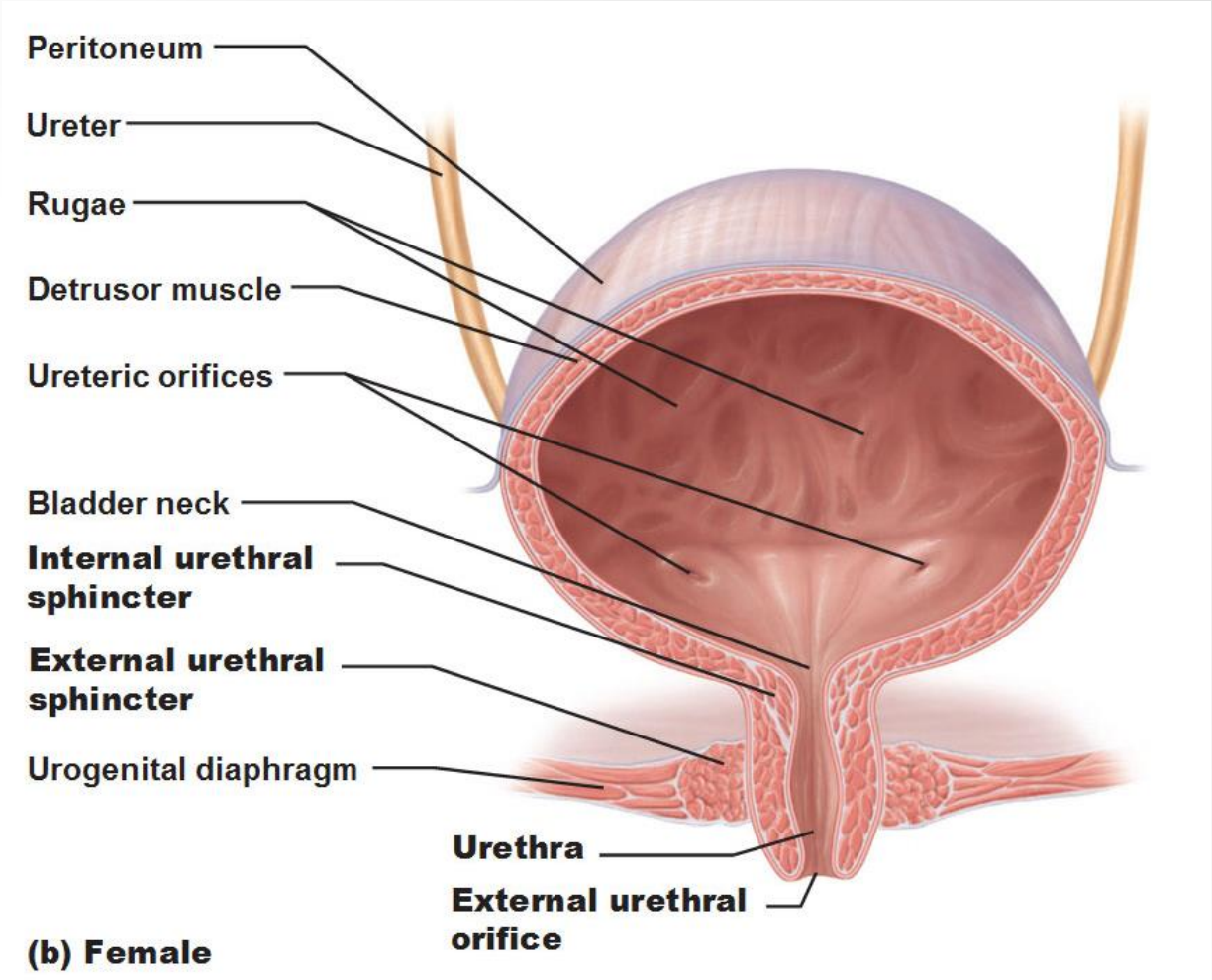
- To gain an understanding of what common surgical options exist for treating different types of female urinary incontinence

- To gain an understanding of the basic indications and contraindications of surgical procedures for female urinary incontinence

- To begin to apply these concepts in a case-based approach

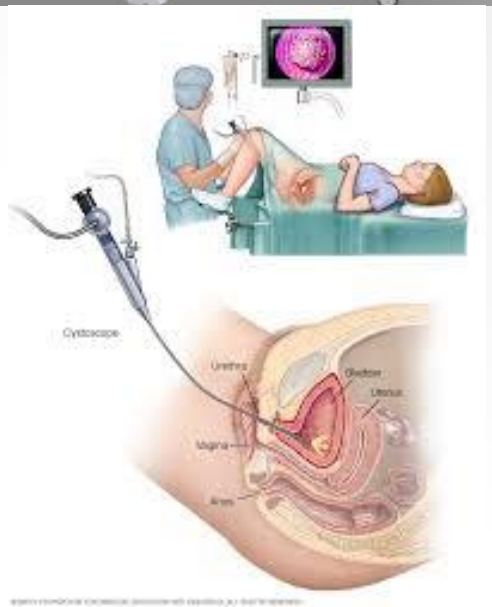
Female Urinary Incontinence

- Stress
- Urgency
- Mixed
- Overflow



Investigations

- History
- Physical exam
- Urine studies
- Voiding diary
- Assessment of bother/ QOL impairment
- Uroflow/scan
- +/- cystoscopy under local anesthetic
- +/- Urodynamics
- +/- renal bladder US



Decision-Making

- Different types of incontinence require different surgical procedures
- Conservative and medical therapies must be maximized
- Shared care approach
- Individualized approach

Decision-Making

Goal: Maximize quality of life, minimize harm!

Surgical Options: Overview

Type of Incontinence	Pathophysiology	Surgical Option
Stress Urinary Incontinence (SUI)	Weakness of pelvic floor supports and urinary sphincter (urethral hypermobility, intrinsic sphincter deficiency)	1. **Mid-urethral mesh sling** 2. **Pubovaginal sling** with autologous fascia 3. **Urethral bulking agent** 4. **Retropubic suspension** (Burch procedure)
Urgency Urinary Incontinence (UUI)	Detrusor overactivity	1. Injection of **onabotulinumtoxinA** 2. **Sacral neuromodulation**
Mixed Urinary Incontinence (MUI)	Combination of above	Combination of above depending on what is predominant
Overflow Urinary Incontinence	Obstruction (rare in female) Hypocontractile bladder	1. **Relief obstruction** 2. Surgery not an option for treatment of hypocontractile bladder (rare exception with SNM)

Stress Urinary Incontinence

- Involuntary leakage of urinary with increased intraabdominal pressure (i.e. exertion, coughing, laughing)
- 51% of woman seeking care for SUI are over 70, but only 16% undergo surgical treatment

  (Abrams P, Neurourol Urodyn 2002)
- Elderly woman often excluded from clinical trials on incontinence surgeries

Stress Urinary Incontinence

- Surgery is effective

Table 2. Cure/dry rates of different anti-incontinence procedures for SUI

Category	Procedure	Objective cure rate (short term)	Objective cure rate (long term)	Level of evidence
BNS	AFS	90%	82% after 48 mo[59]	A
	CFS	74%	80% up to 43 mo[59]	B
	Porcine dermis	73%	54% at 36 mo[54,61]	B
MUS	Retropubic (TVT)	88%	90% at 10 y[62]	A
	TOT	84%	84% at 5 y[62]	B
Open colposuspension	Burch	85-90%	70% at 5 y[63]	A
	MMK			

: *Can Urol Assoc J* 2012;6(5):354-63.

Case 1.

- 75 yo married, independent, female
- 3 ppd due to SUI. No previous incontinence procedures. G4P4
- Med Hx: HTN Meds: Ramipril, vagifem All: none
- Surg hx: 1 c/s
- Plays tennis; is sexually active
- O/E: BMI 28, benign abdomen, urethral hypermobility, ++ SUI, minimal cystocele, tissue well estrogenized
- All required investigations show uncomplicated SUI

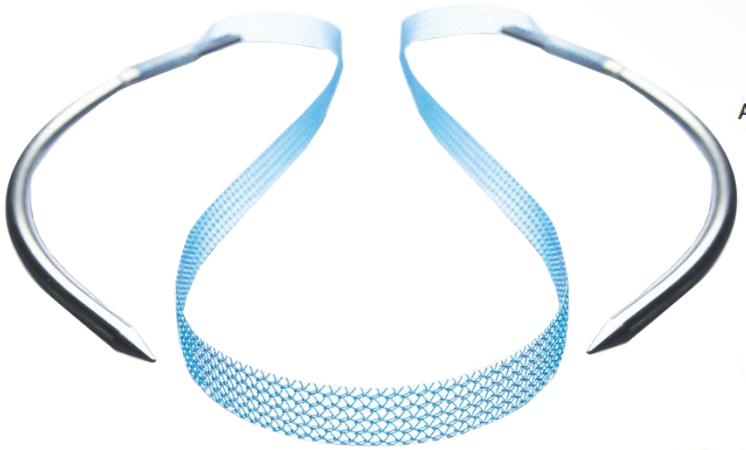
- ***Options for surgical management?***

Midurethral Mesh Slings

- Developed in 1996 *(Ulmsten U, Int Urogyne J, 1996)*
- Most commonly performed surgery for female SUI, most well studied *(Ford A, Cochrane Review, 2015)*
- AKA: Tension-free vaginal tape (TVT), transobturator tape (TOT), mesh tape, TVT-obturator approach (TVT-o)
- As effective, if not more effective, than more invasive approaches such as pubovaginal sling and open retropubic procedures *(Fusco F, Eur Urol 2017)*
- Outpatient procedure for most; general or spinal anesthetic
- Negative media attention has led to slight decrease in use of MUS and to patient concerns

Midurethral Mesh Slings

Retropubic Approach



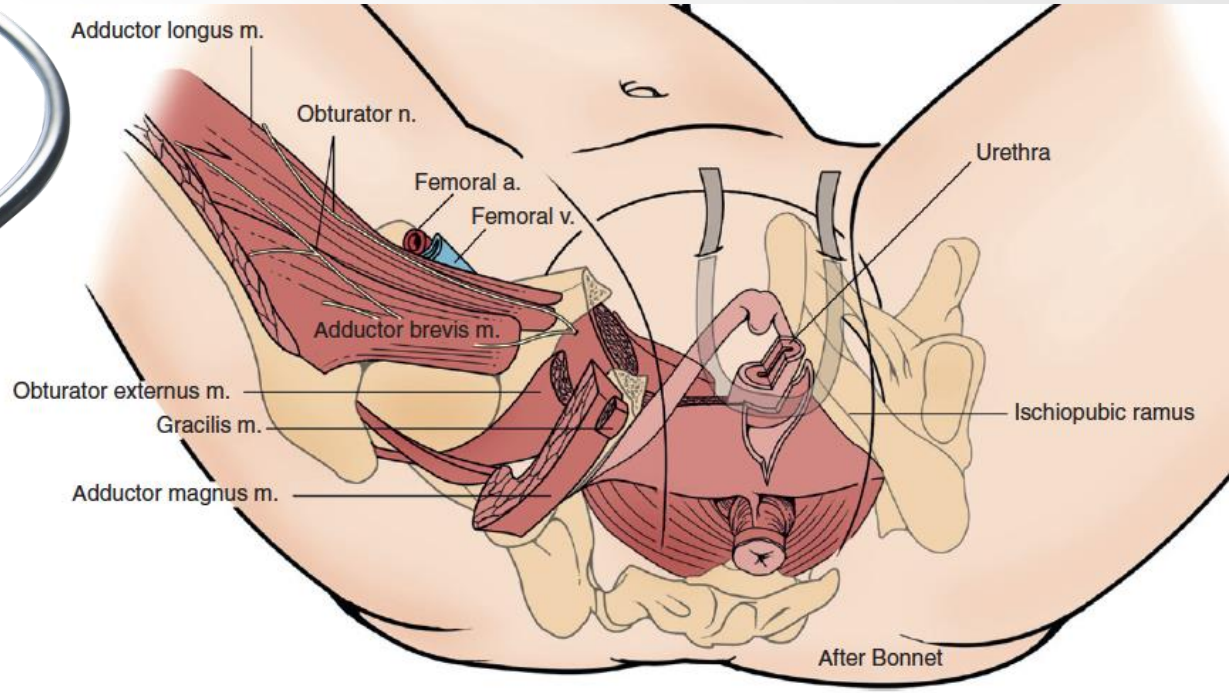
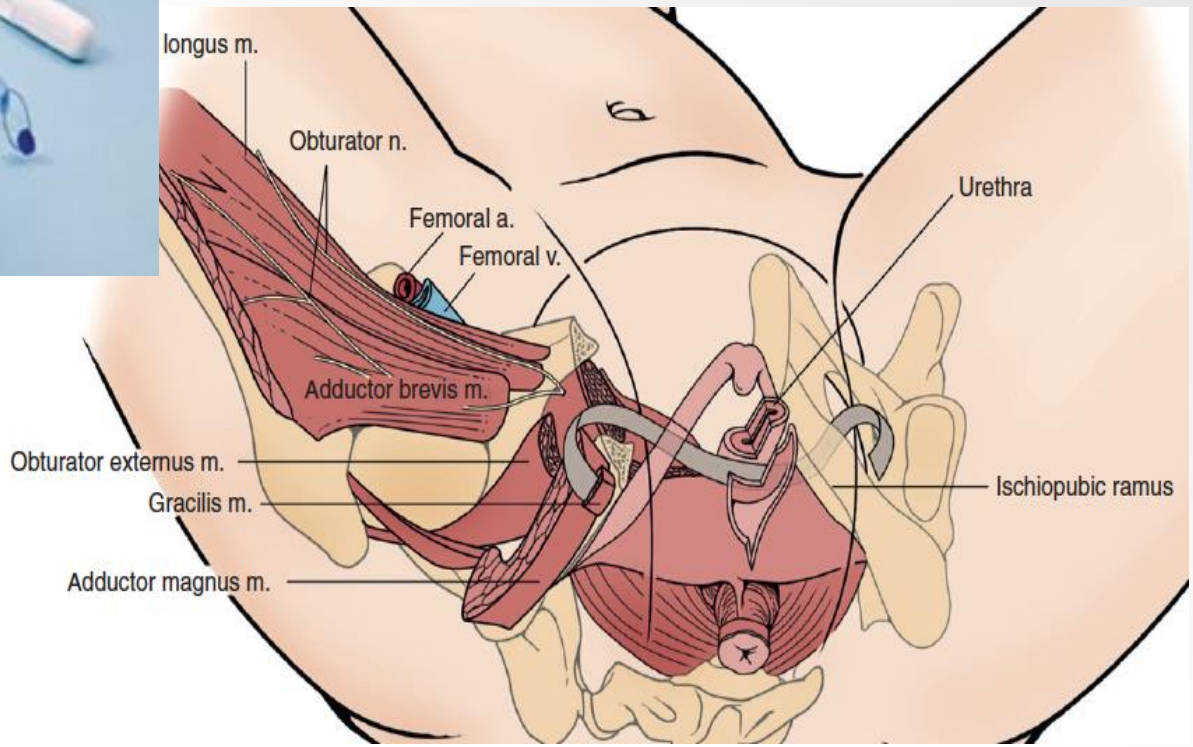


Figure 73–8. Midurethral sling as placed by the suprapubic approach (any technique).

Midurethral Mesh Slings

Transobturator Approach



Retropubic vs Transobturator Approach

- Retropubic approach slightly more effective *(Richter H, NEJM, 2010)*
  - 81% vs 77% objective success rate at 12 mos
- Difference in side effect profile
- Transobturator optimal choice: obese, multiple prior abdominal surgeries, surgeon skillset

Midurethral Mesh Sling

- **Contraindications**: *AGE NOT A CONTRAINDICATION!!*
  - Inability to tolerate surgery
  - Active infection
  - Coagulopathy
  - Previous mesh complications – pain, erosion
  - Urethral fistula
  - Urethral diverticulectomy
  - Can’t access the vagina
  - Relative – prior radiation
  - Patient preference

Case 1. Outcomes

- ‘But at my age Doctor, will the surgery work’?

Case 1. Outcomes

- ‘But at my age Doctor, will the surgery work’?

  - Age may be risk factor for sling failure in the long-term (>5 yr follow-up) *(Laterza R, PLoS One, 2018)*

Case 1. Outcomes

A Multicenter, Prospective, Randomized Clinical Trial Comparing Tension-Free Vaginal Tape Surgery and No Treatment for the Management of Stress Urinary Incontinence in Elderly Women

L. Campeau,[1] L.M. Tu,[2] M.C. Lemieux,[1] A. Naud,[3] G. Karsenty,[1] E. Schick,[4] and J. Corcos[1*]
[1]Department of Urology, Sir Mortimer B. Davis-Jewish General Hospital, McGill University, Montreal, Canada
[2]Department of Urology, Université de Sherbrooke, Sherbrooke, Montreal, Canada
[3]Department of Urology, Université Laval, Quebec, Montreal, Canada
[4]Division of Urology, Hôpital Maisonneuve-Rosemont, Université de Montréal, Montreal, Canada

TABLE III. Results at 6 Months Follow-Up

	TVT	Control	Mean difference (Control-TVT, 95%CI)	*P*-value
Raw scores				
I-QOL	96.5 ± 15.5	61.6 ± 19.8	−34.9 (−44.2, −25.6)	<0.0001
Patient Satisfaction	8.0 ± 2.7	2.0 ± 2.4	−6.0 (−7.4, −4.7)	<0.0001
Urinary Problems	4.5 ± 4.3	11.6 ± 3.5	7.2 (5.1, 9.2)	<0.0001
Change in scores				
I-QOL	38.7 ± 224	2.7 ± 16.4	−36.0 (−46.4, −25.5)	<0.0001
Patient Satisfaction	5.5 ± 3.5	−1.0 ± 3.4	−6.4 (−8.2, −4.6)	<0.0001
Urinary Problems	−6.6 ± 3.9	−0.8 ± 2.9	5.8 (3.9, 7.7)	<0.0001

Neurourology and Urodynamics 26:990–994 (2007)

Case 1. Outcomes

Midurethral Sling Procedures for Stress Urinary Incontinence in Women Over 80 Years

Kobi Stav,* Peter L. Dwyer, Anna Rosamilia, Lore Schierlitz, Yik N. Lim and, Joseph Lee
Department of Urogynaecology (affiliated to Melbourne University), Mercy Hospital for Women, Melbourne, Victoria, Australia
Neurourology and Urodynamics 29:1262–1266 (2010)

TABLE I. Demographic, Surgical, and Preoperative Characteristics of Sling Patients—Comparison Between Elderly and Younger Patients (n = 1112)

	Age ≥80 years (n = 96)	Age <80 years (n = 1016)	*P*-value
Mean age—years[a]	85 ± 3.5 (85) [80–95]	58 ± 11 (58) [20–74]	<0.001
Mean BMI[a]	27.2 ± 4.9 (26) [18–42]	27.5 ± 4.7 (27) [17–46]	0.49

- Subjective cure rate 81% (80+) vs. 85% (<80), p<0.32
- > 80 (n=96)
  - no difference between retropubic and transobturator approach
  - Higher rate of admission/ LOS
  - More likely to have urinary retention postop (37% vs. 9%, p<0.001)

Case 2.

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- Sound familiar??

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- 75 yo married, independent, female
- 3 ppd due to SUI.
- Med Hx: HTN Meds: Ramipril, vagifem All: none
- Sound familiar?? ….. Same as case 1 ***EXCEPT***…

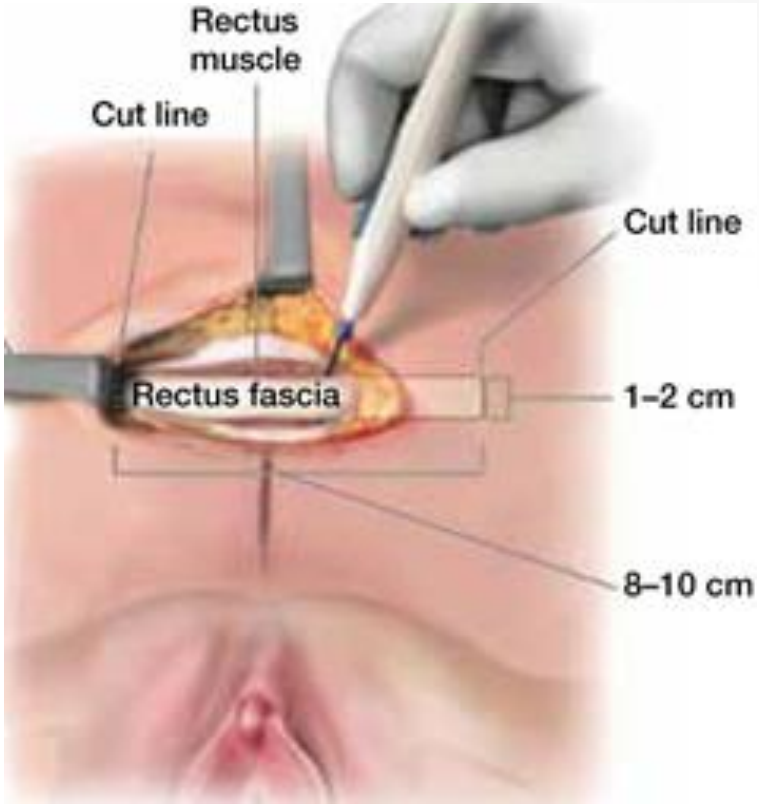
- Surg hx: 1 c/s, AND ***previous midurethral sling (TVT)*** for stress incontinence 3 yrs earlier that worked for 12 months. She is not keen on a second mesh procedure.

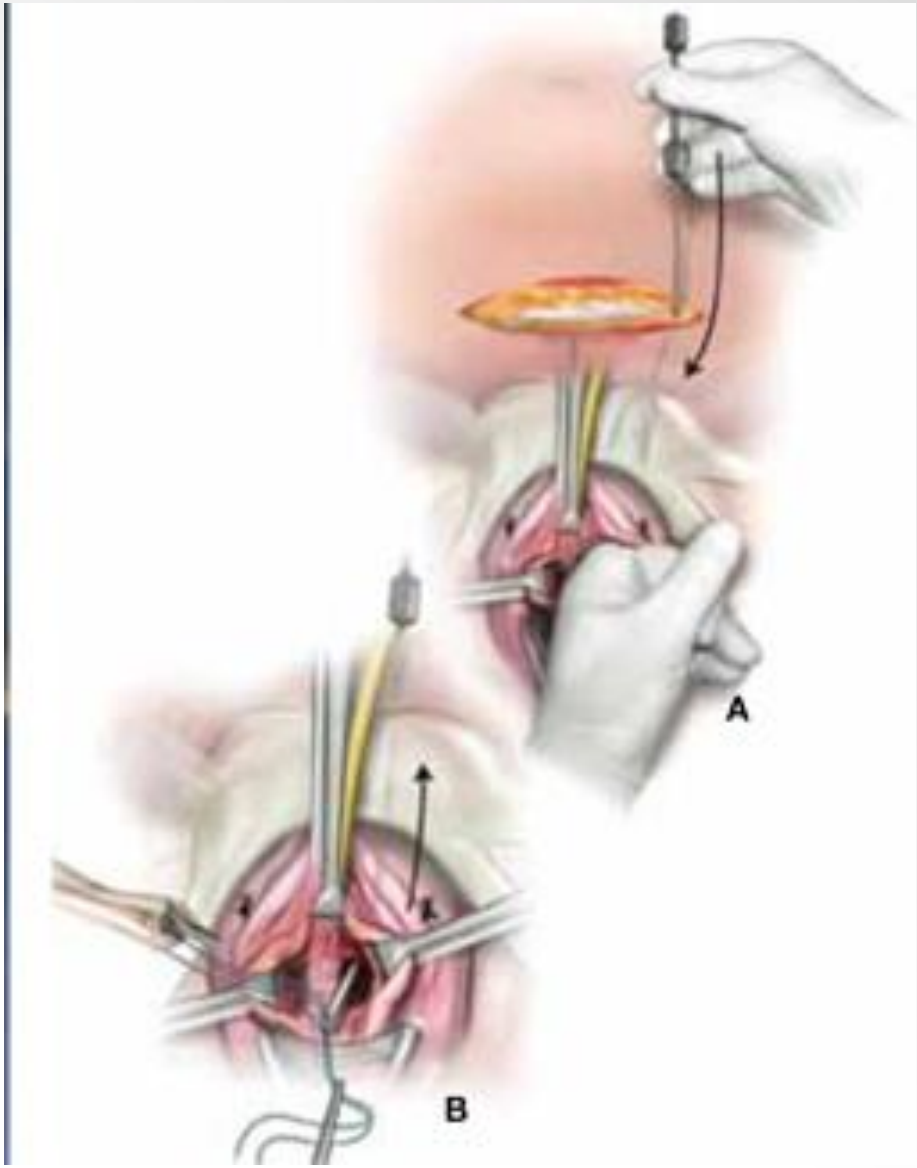
- **Options for surgical management?**

Pubovaginal Sling with Autologous Fascia

- Older technique being done more frequently due to negative media attention surrounding potential mesh complications *(Ghoniem, G Int Urogyne J 2018)*
- More invasive surgical technique
- Use fascia instead of synthetic mesh to create a sling for increased support under the urethra
- General or spinal anesthetic, 1.5 hour operation, in hospital 1-2 days, lithotomy position
- Equivalent objective and subjective success rates to the MUS
- Data specific to elderly patients is lacking

Pubovaginal Sling with Autologous Fascia





Pubovaginal Sling with Autologous Fascia

- Indications:
  - failed previous therapies
  - urethral mesh complications
  - concomitant urethral reconstruction/ urethral diverticulectomy
  - patient who is adverse to the use of mesh

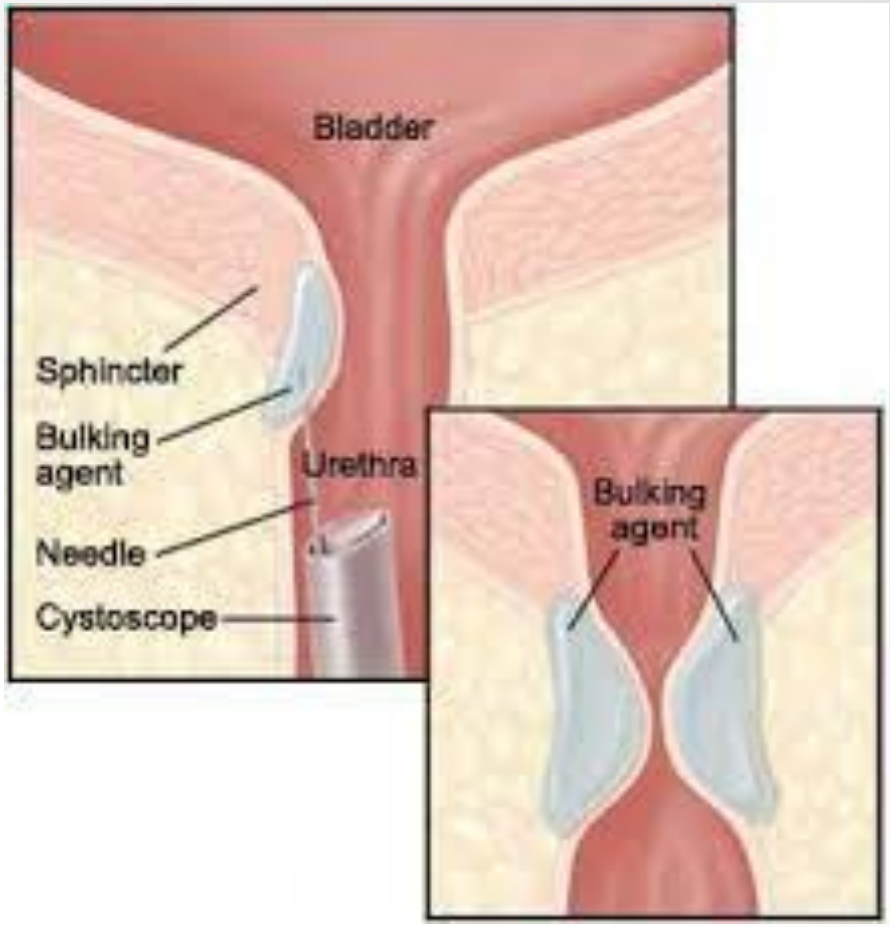
- Outcomes
  - Lacking data in the elderly population
  - In general, similar to TVT (~80-85% success rate at 5 yrs)
  - Higher risk of retention, voiding dysfunction post-operatively

Case 3

- 92 yo active female with MUI
- ++ bothered by 3 ppd for SUI and complains of mild UUI
- Med hx: MI, HTN, DM, arthritis
- Meds: metoprolol, altace, furosemide, metformin, Vit D, Calcium, ASA, amoung others
- Surg hx: appendectomy, hysterectomy, cholecystectomy
- Lives with her son
- O/E: Thin, ambulatory, vaginal exam ++ atrophy, + SUI with minimal mobility, mild cystocele
- Investigations show SUI, good emptying
- ***Any reasonable surgical option?***

Urethral Bulking Agent

Fig. 1 The Urethroscope, connected to the rotatable sheath, with inflow/outflow tubings. The needle (23G x 12 cm) is placed in the working-canal connected to a 1 ml syringe with Bulkamid



Urethral Bulking Agent

- Bulkamid® (polyacrylamide hydrogel -2.5% cross-linked polyacrylamide and 97.5% water)
- Outcomes inferior to more invasive surgical approaches
  - 12 mos: 47.2% no SUI episodes; 77% considered themselves improved or cured *(Sokol E, 2014)*
- RCTs include elderly females
  - *Lose G, Int Urogyne J 2010* – median age 56 (range 29-**82**)
  - *Sokol E, J Urol 2014* – median age 58 (range 23-**93**)
- Remains a reasonable option for elderly patients who would not tolerate more invasive surgery or have poor vaginal access/ atrophy

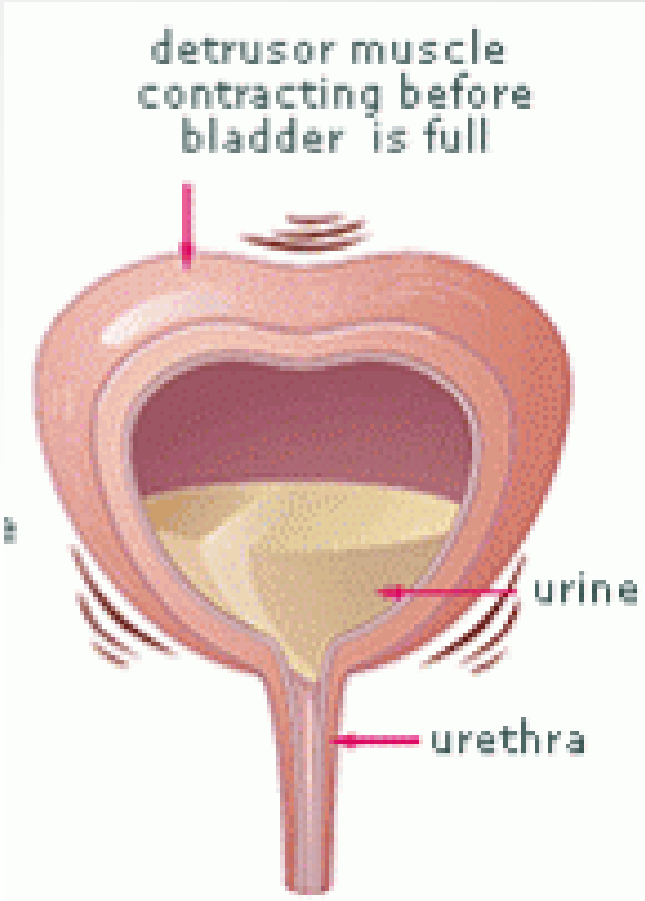
Urgency Urinary Incontinence

Urgency Urinary Incontinence

- 'The sudden loss of urine accompanied by or immediately proceeded by the urgency to void' *(ICS)*

- ~2.5-4% of general population and increases with age *(Irwin D, Eur Urol 2006)*
- Larger impact on QOL than SUI

- Slings are NOT indicated to treat UUI in the absence of SUI

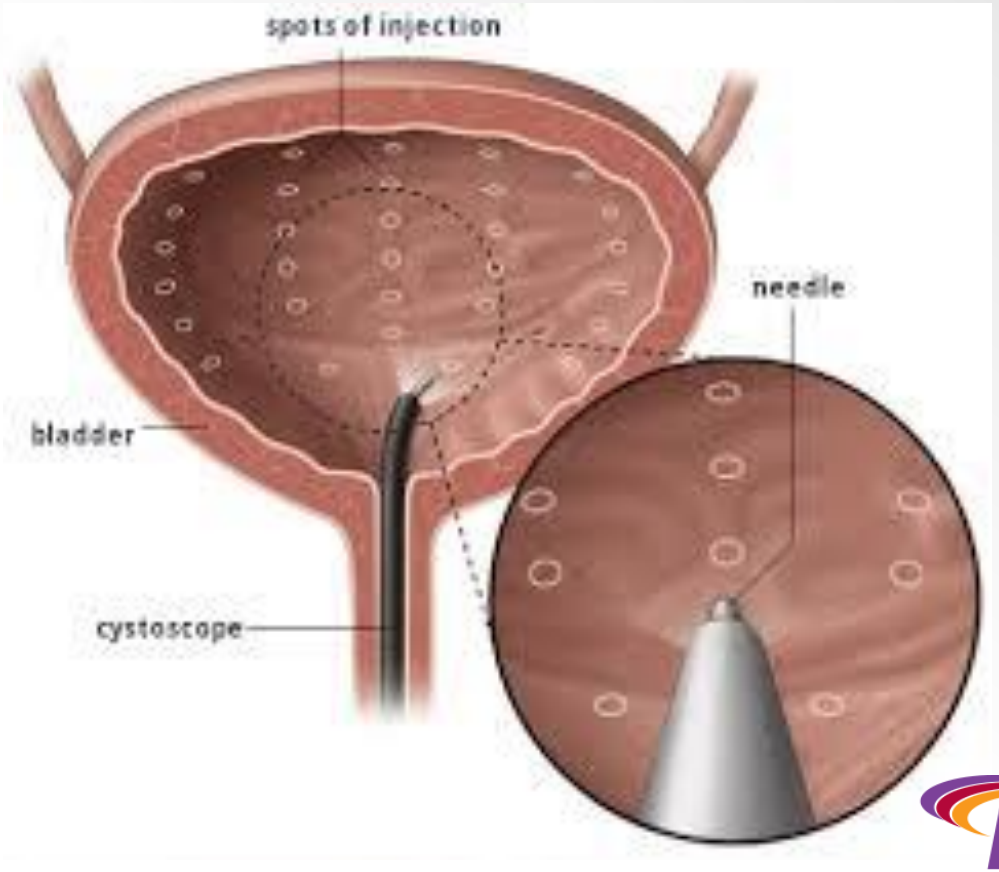


Case 4. Refractory UUI

- 82 yo female with UUI wearing 5 ppd, wet every night –can't make it to washroom on time, dx10, nx2
- ++ bothered
- 4 medications and conservative therapies failed
- Can't afford pads any longer
- Med hx: HTN, DM, COPD, hypothyroid
- Meds: metoprolol, Ramipril, Synthroid, metformin, Januvia, puffers, amoung others
- Surg hx: appendectomy, hysterectomy, c/s x 2

- ***Surgical options?***

Refractory UUI



BOTOX®
onabotulinumtoxinA injection

Third line therapies for OAB and UUI *(CUA Guidelines, 2017)*

Refractory UUI

Sacral Neuromodulation
(InterstimII, Medtronic)

Third line therapies for OAB and UUI *(CUA Guidelines, 2017)*

JAMA | Original Investigation

OnabotulinumtoxinA vs Sacral Neuromodulation on Refractory Urgency Urinary Incontinence in Women
A Randomized Clinical Trial

Cindy L. Amundsen, MD; Holly E. Richter, PhD, MD; Shawn A. Menefee, MD; Yuko M. Komesu, MD; Lily A. Arya, MD, MS; W. Thomas Gregory, MD; Deborah L. Myers, MD; Halina M. Zyczynski, MD; Sandip Vasavada, MD; Tracy L. Nolen, DrPH; Dennis Wallace, PhD; Susan F. Meikle, MD, MSPH; for the Pelvic Floor Disorders Network

- N=364
- Age: botox mean (SD) 62.9(11.5) vs 63.1(11.8)
- Botox reduced number of UUI episodes by -3.9 vs -3.3 episodes per day in the SNM group, p=0.01
- Botox led to higher rate of CIC and UTIs

OnabotulinumtoxinA (Botox)

- Woman 65+ less likely than woman <65 to have symptom resolution *(Komescu Y, Am J Obstet Gynecol, 2019)*

- Older patients may be at higher risk of post-op urinary retention *(Miotla P, Int Urogyne J 2017)* and urinary tract infections *(Komescu Y, Am J Obstet Gynecol, 2019)*

Residual volumes (ml)	Age (years), mean ± SD
Group 1 <50 ml ($n = 106$)	61.1 ± 14.5
Group 2 51–100 ml ($n = 41$)	57.0 ± 12.1
Group 3 101–200 ml ($n = 35$)	60.7 ± 11.8
Group 4 201–350 ml ($n = 13$)	68.5 ± 10.2[a]
Group 5 urine retention requiring CISC ($n = 13$)	68.8 ± 11.2[b]

OnabotulinumtoxinA (Botox)

OnabotulinumtoxinA Treatment for Overactive Bladder in the Elderly: Practical Points and Future Prospects

Hann-Chorng Kuo[1]

Drugs Aging (2016) 33:1–9

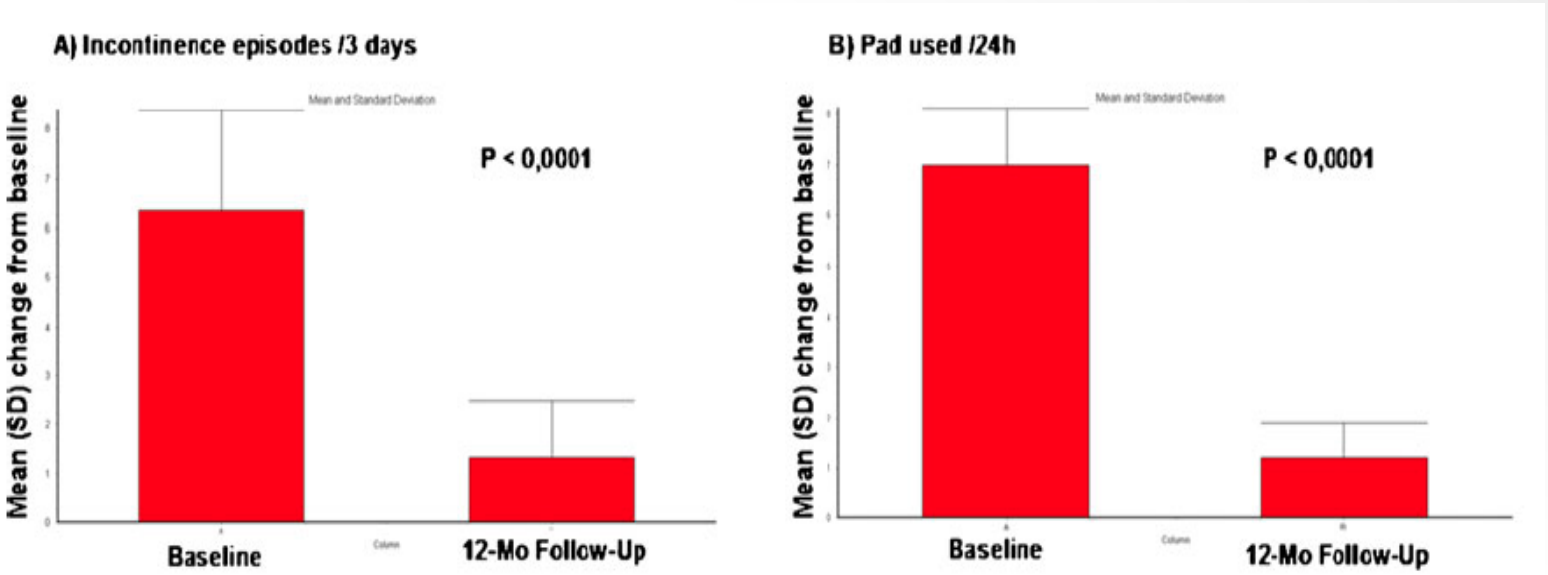
Table 1 Advantages and disadvantages of onabotulinumtoxinA intravesical injection treatment for overactive bladder in elderly patients, in comparison with oral medication

	Advantages	Disadvantages
Bladder sensation	Decreases in frequency, nocturia and urgency episodes [51–54]	Decrease in bladder sensation, difficulty in urination [62]
Detrusor contractility	Decrease in urgency urinary incontinence episodes [51–54]	Decrease in voiding pressure Decrease in voiding efficiency Acute urinary retention [62]
Bladder capacity	Increase in voided volume, increase in cystometric bladder capacity [51–54]	Increase in post-void residual volume [64, 69] Urinary retention [70]
Adverse events	Lack of systemic adverse events due to antimuscarinics or β_3-adrenoceptor agonism, such as dry mouth, constipation, blurred vision, dizziness, tachycardia, hypertension [51–54]	Local adverse events such as haematuria, pain during urination [70] Increase in urinary tract infection incidence [52] Clean intermittent catheterization may be necessary [55]
Central nervous system effect	No cognitive impairment in Parkinson's disease patients with overactive bladder [57, 58]	
Administration	Treatment 1–2 times per year [51–54]	Need for an injection
Long-term efficacy	Efficacy persists for >6 months [51–54, 70]	Efficacy is less persistent in the elderly than in general OAB patients [56]

Drugs Aging (2016) 33:1–9

Sacral Neuromodulation

- Elderly patients *(Angioli R, Int Urogyne J, 2013)*
  - Mean age 76 (65-86)
  - At 1 yr: 27.8% improved, 55% UUI resolved, UUI episodes decreased from 6.3/d to 0.5/d; improved nocturia
  - No major post-operative complications



In Summary

- Different surgical approaches exist depending on the type of urinary incontinence

- For SUI, MUS synthetic slings and pubovaginal slings with fascia are options for elderly patients ABLE and WILLING to tolerate surgery

- For SUI, urethral bulking agents are available for patients who are unable (or unwilling) to undergo more invasive procedures -less effective however

In Summary

- For UUI, both onabotulinumtoxinA and sacral neuromodulation are options for patients who have symptoms refractory to medications
- Botox can be performed under local anesthetic or sedation while SNM requires a general anesthetic
- Advanced age is associated with higher risk of complications from Botox
- Age is NOT an absolute contraindication to surgery for female urinary incontinence

- Thank you
- Questions?