

W13: Complications of Incontinence and Prolapse Surgery: Evaluation, Intervention, and Resolution - A Review from Both Specialties

Workshop Chair: Howard Goldman, United States

20 October 2014 14:00 - 18:00

| Start | End | Topic | Speakers |
|-------|-------|--|--|
| 14:00 | 14:05 | Introduction | <ul style="list-style-type: none"> Howard Goldman |
| 14:05 | 14:35 | Complications of incontinence surgery (except retention) | <ul style="list-style-type: none"> Sandip Vasavada |
| 14:35 | 15:05 | Retention/Voiding dysfunction after incontinence surgery | <ul style="list-style-type: none"> Roger Dmochowski |
| 15:05 | 15:20 | Discussion | All |
| 15:20 | 15:30 | Questions | All |
| 15:30 | 16:00 | Break | None |
| 16:00 | 16:20 | Complications of prolapse surgery (except dyspareunia) | <ul style="list-style-type: none"> Kamran Sajadi |
| 16:20 | 16:40 | Mesh complications of prolapse surgery | <ul style="list-style-type: none"> Howard Goldman |
| 16:40 | 16:55 | Discussion | All |
| 16:55 | 17:10 | Questions | All |
| 17:10 | 17:35 | Dyspareunia after pelvic floor surgery | <ul style="list-style-type: none"> Tristi Muir |
| 17:35 | 18:00 | Questions | All |

Aims of course/workshop

This course will summarize both common and uncommon complications associated with standard and new technologies used for pelvic floor reconstruction and urinary incontinence therapy in women. The intent of this course is to present both the approach to evaluation and management of these complications from both the urologic and urogynaecologic perspective of the combined faculty. The emphasis is on newer technologies and complications, both acute and chronic, that are associated with these various surgeries. The goal of this course will be to summarize, not only, identification, but also evaluation and appropriate intervention, as well as patient counselling for these various complications.

Complications of Incontinence and Prolapse Surgery: Evaluation, Intervention, and Resolution—A Review from Both Specialties

Sandip P Vasavada MD
 Roger R Dmochowski MD
 Kamran P Sajadi MD
 Howard B Goldman MD
 Tristi W Muir MD

Complications of Stress Incontinence Surgery (Slings) : (Excluding Voiding Issues)

Complications of Vaginal Sling Surgery

- Bleeding
- Infection
- Bladder injury/Perforation
- Bladder outlet obstruction
- Urethral injury
- Neurologic injury/pain
- Mesh related
 - Extrusions into vagina
 - Mesh erosions into urethra
 - Mesh erosions into bladder

Bleeding During Sling Surgery

- Retropubic passage:
 - entry into retropubic space
 - Sling placement/close observation
 - Foley catheter into bladder, 60cc in balloon and compression
 - Trochar passage
 - Point cautery
 - Usually due to close passage near urethra/periurethral neurovascular compartments
 - Retropubic TVT passage (recognition of injury is key)
 - Exploration (retropubically/open): not transvaginally

Bleeding in Slings

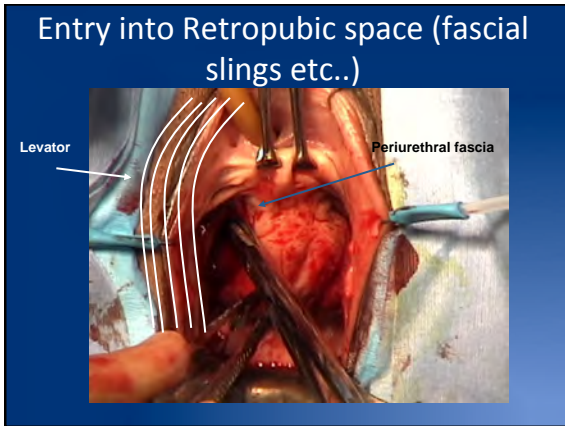
- May occur 0.5 to 8% of time
- No difference between Burch BNS and fascial slings based on SisteR trial (2009)
- TOT lower likelihood of bleeding and transfusion rates overall less than 1%

Bleeding into Obturator Space

- Very little data
 - Most bleeding will stop with some pressure and placement of sling/compression
 - Foley balloon and inflate with 60 cc sterile water
- What is the utility (if any) of a vaginal pack ?
- case reports
- Compartment syndrome potential
- Use of angiography and embolization?

Bleeding during Retropubic Space entry

- Entry into retropubic space
 - Preservation of endopelvic fascia
- Enter just lateral to periurethral fascia
- Medial to levator fascia and musculature
- Oblique angle 30 degrees from midline towards ipsilateral shoulder



Infections

- Sling related infections (with new type 1 meshes are extremely uncommon)
 - Obtape
 - ProteGen
- Urinary tract infections can occur within the first month after sling surgery
 - Discharge
 - Slowing of urine stream
 - Catheters etc..

Perioperative Urinary Tract infections

- Post-sling UTI incidence varies from 8-33% (Anger, Laurikainen)
 - Studies not designed to look at this problem
 - Loss to follow-up
 - Lack of standardized perioperative management
 - Perioperative antibiotic protocols often not standardized
 - Diagnostic methods not clear
- Skin and vaginal infections are rare (Laurikainen)
- Overall infection after sling is 5.5 % (Paraiso)
- Single dose may be as effective as 24 hr or more, less antibiotic related AE's (Swartz et al, Urology 2009)
- Used more commonly as a metric in *Outcomes*

Bladder Injury/Perforation

- Not uncommon
- Most series of retropubic slings show rates of 0-24%
- TOT slings too
- 6x less TOT
- Recognized?
- Cystoscopy
 - SUI guidelines

| Study or Population | Individuals at Risk | Clinical (%) | OR (%) | OR (95% CI) | OR (95% CI) | OR (95% CI) |
|-----------------------------|---------------------|--------------|--------|-------------------|-------------|-------------|
| Bladder Injury | | | | | | |
| TOT | 4700 | 40/71 | 0.87 | 0.71 (0.55, 1.05) | 0.87 | |
| TOT | 17646 | 307/172 | 1.73 | 1.58 (1.40, 1.78) | 1.73 | |
| Controlled | 17166 | 43/163 | 0.25 | 0.24 (0.17, 0.34) | 0.25 | |
| Urinary incontinence | | | | | | |
| TOT | 4694 | 12/101 | 0.03 | 0.03 (0.01, 0.06) | 0.03 | |
| Controlled | 45912 | 40/128 | 0.03 | 0.03 (0.02, 0.04) | 0.03 | |
| Mesh erosion | | | | | | |
| TOT | 18807 | 14/103 | 0.07 | 0.07 (0.04, 0.10) | 0.07 | |
| Controlled | 18807 | 4/111 | 0.02 | 0.02 (0.01, 0.03) | 0.02 | |
| Urethral obstruction | | | | | | |
| TOT | 21341 | 2/103 | 0.01 | 0.01 (0.00, 0.02) | 0.01 | |
| Controlled | 20906 | 2/103 | 0.01 | 0.01 (0.00, 0.02) | 0.01 | |
| Urethral stricture | | | | | | |
| TOT | 1422 | 1/14 | 0.07 | 0.07 (0.01, 0.27) | 0.07 | |
| Controlled | 1422 | 0/12 | 0.00 | 0.00 (0.00, 0.00) | 0.00 | |
| Urethral fistula | | | | | | |
| TOT | 17124 | 1/12 | 0.01 | 0.01 (0.00, 0.02) | 0.01 | |
| Controlled | 16908 | 0/12 | 0.00 | 0.00 (0.00, 0.00) | 0.00 | |
| Urethral fistula | | | | | | |
| TOT | 14448 | 0/12 | 0.00 | 0.00 (0.00, 0.00) | 0.00 | |
| Controlled | 14448 | 0/12 | 0.00 | 0.00 (0.00, 0.00) | 0.00 | |

Bladder perforation

- Proper recognition of entry
 - Fluid emanating from space (urine)
 - Irrigation of foley (+/- Indigo Carmine)
 - Cystoscopy
- Suture passage (no further therapy)
- Multilayer closure +/- Martius flap
- No overlapping suture lines
- Good urinary drainage x 5 - 7 days
 - Cystogram to confirm healed bladder wall

Urethral Injury

- Overall low incidence (< 1%)
- Again, essential to recognize injury
 - Careful cystourethroscopy
 - Reposition needle/trochars
 - Large injury: probably best to abort surgery (mesh)
 - Primary repair
 - Martius flap ??
- TOT incidence is extremely low but higher with outside in than inside out (BJU int 2010)

Neurologic Injury/Pain

- Trochar passage retropubically (ilioinguinal nerve branches) esp if too lateral
- TOT sling passage can injure groin nerves (higher incidence in less obese patients)
 - Runners
 - Athletic patients
 - Considerations for consent
- TOT (outside in vs inside out): at least transiently, inside out seems to have more pain/neurologic potential abn
- Positioning.... Especially if longer case (prolapse etc..)

Neurologic injury

- Entrapment of ilioinguinal nerve branches just lateral to pubic symphysis
- Obturator branches in groin
 - Mesh arms
- Sacrospinous ligament fixation
- Patient positioning:
 - Gentle positioning
 - Avoidance of excessive pressure and tension

*Rovner et al. 1999

Neurologic Injury: Positioning Mechanism of Injury



Mechanism of injury



Management of Nerve Injury

- Conservative (NSAIDS), rest, time
- Neural pain medications (neurontin etc)
- Pain injections/steroid injections
- Physical therapy
- Removal of sling material
 - May not help pain
 - May elicit more trauma

Mesh Related Complications of Vaginal Sling Surgery

- Extrusion (vaginal exposure)
- Perforation (into urinary tract)
 - Urethra
 - Bladder
- Optimal management

Update from US-FDA

- In particular, the literature review revealed that: Mesh used in transvaginal POP repair introduces risks not present in traditional non-mesh surgery for POP repair.
- Mesh placed abdominally for POP repair appears to result in lower rates of mesh complications compared to transvaginal POP surgery with mesh.
- There is no evidence that transvaginal repair to support the top of the vagina (apical repair) or the back wall of the vagina (posterior repair) with mesh provides any added benefit compared to traditional surgery without mesh.
- **While transvaginal surgical repair to correct weakened tissue between the bladder and vagina (anterior repair) with mesh augmentation may provide an anatomic benefit compared to traditional POP repair without mesh, this anatomic benefit may not result in better symptomatic results.**

This does not help....

Have You Suffered from Bladder Sling Mesh Complications?



We Can Help With a Free Consultation. Get the Compensation You Deserve



FDA Warning
Serious Injuries



Call 1-800-962-0464

www.YouHaveALawyer.com/Mesh

Complications from
Surgical Mesh
for Repair of
Pelvic Organs Protrude
Stress Urinary Incontinence

1-800-583-4444

Mesh Complication Presentation

- Extrusion
 - Vaginal discharge
 - Pain
 - Dyspareunia
- Perforation
 - Pain
 - Urinary tract infections
 - Overactive bladder and irritative LUTS
 - Obstructive voiding symptoms
 - hematuria

Mesh Exposure from Slings

- Data shows incidence of less than 2% (Abdel-Fattah et al, BJU int, 2006)
- Most were in ObTape patients
- Etiology
 - Thin flap dissection
 - Vaginal atrophy
 - Breakdown of incision lines

Managing Mesh Complications

- Resolution of mesh exposure may be done with antibiotics and estrogen cream
- Treat in office when mesh exposure is:
 - Easy to reach and near the introitus
 - Small and requires minimal excision
- Treat in OR if mesh exposure is:
 - Large and requires reapproximation of mucosa

Vaginal Erosions of Mesh are Increasing in Incidence as the Use of Mesh Increases

Erosions can be found after:

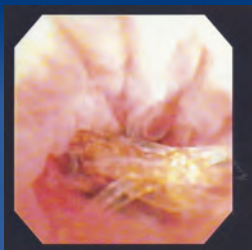
- Slings
- Abdominal sacral colpopexy (open or laparoscopic)
- Cystocele and rectocele repairs
- Tunneller procedures for vaginal apex prolapse

Diagnosis of Mesh Perforation

- History:
 - Pain
 - Urinary tract infections
 - Overactive bladder and irritative LUTS
 - Obstructive voiding symptoms
 - hematuria
- Physical exam (tenderness suburethrally ?)
- Cystoscopy (flexible) bias
- Ultrasonography: transvaginal/labial
- Urodynamics ? Is patient obstructed ?

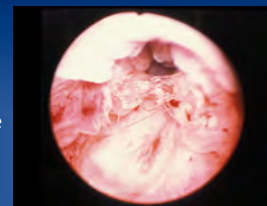
Urethral Perforation/Erosion

- Presenting symptoms may dictate best treatment option
 - Elderly patient
 - Minimal symptoms
 - Hematuria
 - No irritative or obstructive symptoms



Erosion into Urethra

- Should be noted on preop cystoscopy
- Can be managed with endoscopic rx (not scissors, TUR or Bugbee but rather Holmium laser)
- Follow up cysto to assure no remaining edges



Perforations/Erosions into Bladder

- Optimal management again depends on patient symptoms
 - Endoscopic (holmium laser)
 - Transvesical (definitive)
 - Single port (Cleveland Clinic experience)
 - Open (allows excision of all portions of mesh)
 - Transvaginal (if posterior).... Fistula potential

Endoscopic Management

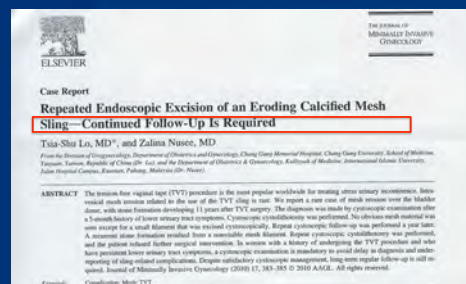


Table 2. Adverse events.

| Event | Mesh Procedures (N = 127) | Sling Procedures (N = 128) | P Value ^a |
|---|------------------------------|-------------------------------|----------------------|
| | n (%) | n (%) | |
| Serious adverse events | 32 (25) | 42 (33) | 0.24 |
| Female groin hernia | 0 | 47 | |
| Female urinary | 0 | 0 | |
| Complications | 22 | 30 | 0.12 |
| Intra-abdominal | 0 | 0 | |
| Enterovaginal fistula | 1 | 0 | |
| Small bowel obstruction | 1 | 0 | |
| Vaginal prolapse | 10 | 2 | |
| Erosion of synthetic mesh | 1 | 0 | |
| Rectovaginal fistula | 1 | 0 | |
| Pneumonia | 1 | 1 | |
| Catheter complication | 1 | 1 | |
| Urinary tract infection requiring hospitalization | 0 | 0 | |
| Hematuria | 0 | 2 | 0.25 |
| Hemorrhage | 0 | 1 | 0.25 |
| Mesh or component erosion, surgical intervention | 1 | 1 | 1.00 |
| Lymphocele requiring intervention | 0 | 1 | 0.50 |
| Lymphocele requiring hospitalization | 0 | 1 | 0.50 |
| Adverse events | 115 (91) | 126 (99) | <0.001 |
| Female groin hernia | 207 | 419 | <0.001 |
| Complications | 207 | 160 | |
| Urinary | 202 | 294 | |
| Urinary tract infection | 4 | 4 | 0.29 |
| Urinary tract infection requiring hospitalization | 0 | 1 | 0.29 |
| Hematuria | 0 | 1 | |
| Hemorrhage | 0 | 1 | |
| Mesh or component erosion and requiring surgical intervention | 0 | 1 | 0.50 |
| Lymphocele | 0 | 0 | 0.50 |
| Pneumonia | 0 | 0 | 0.50 |
| Hemorrhage | 0 | 0 | 0.50 |
| Enterovaginal fistula | 0 | 0 | 0.50 |
| Small bowel obstruction | 0 | 0 | 0.50 |
| Vaginal prolapse | 0 | 0 | 0.50 |
| Erosion of synthetic mesh | 0 | 0 | 0.50 |
| Rectovaginal fistula | 0 | 0 | 0.50 |
| Catheter complication | 0 | 0 | 0.50 |
| Urinary tract infection requiring hospitalization | 0 | 0 | 0.50 |
| Hematuria | 0 | 0 | 0.50 |
| Hemorrhage | 0 | 0 | 0.50 |
| Mesh or component erosion, surgical intervention | 0 | 0 | 0.50 |
| Lymphocele requiring intervention | 0 | 0 | 0.50 |
| Lymphocele requiring hospitalization | 0 | 0 | 0.50 |

Albo, et al. SISTeR trial, NEJM

Conclusions

- Mesh use for slings is likely here to stay
- Surgical principles in exposure (flaps) and closure are important considerations
- Complications can and will occur
- Recognition is key
- If postoperative recognition, complete removal (exposed and then some margin.. Will be necessary in most patients)

Post Operative Voiding Dysfunction and Obstruction: Diagnosis and Treatment

Etiologies

- Iatrogenic – post operative for incontinence procedure (most common)
- Iatrogenic – repetitive urethral instrumentation
 - Intrinsic stricture disease
- Smooth sphincter dysfunction
 - Bladder neck dysfunction
- Functional
 - Dysfunctional voiding

Iatrogenic – repetitive urethral instrumentation

Intrinsic stricture disease

- Urethral mucosal involvement
- Causes
 - Repetitive urethral dilatation
 - Prior diverticulectomy
 - Catheter related phenomenon
- Treatments
 - Dilatation
 - Incision
 - Reconstruction

Iatrogenic Obstruction

- True incidence after incontinence surgery not known
 - Literature estimates 2.5 - 24%
 - Obstruction requiring intervention
 - Contemporary sling series 1-3%
 - TVT 1.7 -4.5%

Voiding Dysfunction After Incontinence Surgery

- Medicine search 1966-2001, Urolog J 2004; 15:25-31
- Retrospective collections, case reports or case cohort series
- Rates of voiding dysfunction:
 - Burch - 4-22%
 - MMK - 5-20%
 - PVS - 4-10%
 - Needle Susp. - 5-7%
 - TVT - 2-4%

Etiology

- Obstruction / Incomplete Emptying
 - Excessive tension or misplaced sutures or sling
 - Postoperative cystocele or other prolapse
 - “Relative” impaired detrusor contractility
 - Habitual voiding by abdominal straining
- Storage Symptoms (Frequency/Urgency/UUI)
 - DO secondary to obstruction
 - DO without obstruction
 - “Sensory urgency”

Presentation

- Urinary retention
- Voiding (obstructive) symptoms
- Storage (irritative) symptoms
 - frequency, urgency, urge incontinence
- Recurrent UTI
- May have recurrent or persistent SUI with obstruction

Timing of Evaluation / Intervention

- First 3 months - watchful waiting vs. early intervention
 - Depends on procedure done
- 3 - 6 months - consider formal evaluation and intervention
 - Decision often based on degree of bother to patient
 - May still experience improvement
- After 6 months - condition less likely to improve
 - especially for cases of retention

Evaluation

- History*
 - Preoperative voiding and continence status
 - Onset of symptoms
 - Type of procedure performed
 - Number and type of other procedures
- Physical Exam*
 - “Over correction”
 - Hypermobility
 - Cystocele, enterocele, rectocele, uterine prolapse

* In cases of retention history and physical may be all that is needed

Evaluation

- Endoscopy
 - Eroded sutures
 - Eroded sling
 - Urethral kink or displacement
 - Bladder neck mobility - kinking with straining
- Urodynamics
 - Videourodynamics

Urodynamics

- Not always helpful in making diagnosis of obstruction after incontinence surgery
 - Webster & Kreder, 1990
 - "Urodynamics may fail to diagnose obstruction"
 - Foster & McGuire, 1993
 - Urodynamics did not predict outcome
 - Nitti & Raz, 1994
 - P_{det} and Q_{max} were not predictive of outcome independently or together. All "acontractile" patients successful

Intervention

- Only *absolute* selection criteria for urethrolysis should be a temporal relationship between surgery and onset of voiding symptoms
- Failure to generate a detrusor contraction during urodynamics should not exclude a patient from definitive treatment, e.g. urethrolysis

Treatment Options

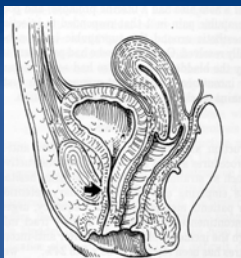
- Conservative
 - CIC
 - Pharmacotherapy
 - Biofeedback
 - Dilatation (??)
- Definitive
 - Surgical

Definitive Treatment Options

- Urethrolysis
 - Transvaginal
 - Retropubic
 - Suprameatal (infrapubic)
- Sling incision
- Mid urethral synthetic sling loosening or incision
- Cut suspension/sling sutures
 - Would expect greatest success if done early
 - *No documented peer-reviewed series*

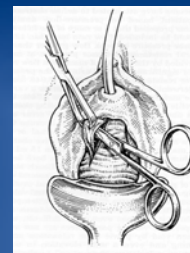
Anatomy

- Urethra may be fixed to the pubic bone with dense scar tissue
- Goal of urethrolysis is to completely free & mobilize urethra



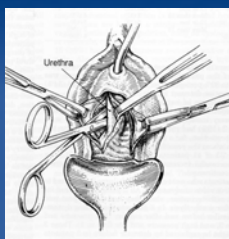
Transvaginal Urethrolysis

- Inverted U incision
- Lateral dissection above periurethral fascia
- Endopelvic fascia sharply perforated and retropubic space entered

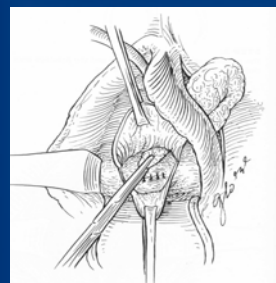


Transvaginal Urethrolysis

- Sharp and blunt dissection freeing the urethra from the undersurface of the pubic bone
- Index finger placed between pubic bone and urethra

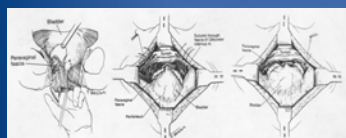


Transvaginal Urethrolysis Optional - Interposition of Martius Flap



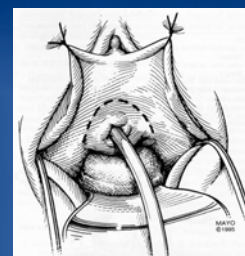
Retropubic Urethrolysis

- Mobilization of urethra by sharp dissection – Restore complete mobility to anterior vaginal wall
- Paravaginal repair
- Interposition of omentum between urethra and pubic bone



Suprameatal Urethrolysis

- Curved incision above the urethra



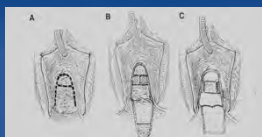
Urethrolysis Results

| | <i>N</i> | <i>Type</i> | <i>Success</i> | <i>SUI</i> |
|------------------|----------|--------------|----------------|------------|
| Foster & McGuire | 48 | Transvaginal | 65% | 0 |
| Nitti & Raz | 42 | Transvaginal | 71% | 0 |
| Cross, et al | 39 | Transvaginal | 72% | 3% |
| Goldman, et al | 32 | Transvaginal | 84% | 19% |
| Petrou, et al | 32 | Suprameatal | 67% | 3% |
| Webster & Kreder | 15 | Retropubic | 93% | 13% |
| Petrou & Young | 12 | Retropubic | 83% | 18% |
| Carr & Webster | 54 | Mixed | 78% | 14% |

Sling Incision

Sling Incision

- Case report described by Ghoneim in 1995 using a vaginal graft interposition



- Later several authors reported small series of sling incision with and without interposition of vaginal wall

Pubovaginal Sling Lysis

- Freeing of the sling from the underlying urethra
 - May require sharp or blunt dissection
- No perforation of the endopelvic fascia
- No freeing of the urethra from the pubic bone
- Closure of the vaginal wall



Sling Incision Results

| | <i>N</i> | <i>Type</i> | <i>Success</i> | <i>SUI</i> |
|-----------------|----------|--------------------|----------------|------------|
| Nitti, et al | 19 | Midline Incision | 84% | 17% |
| Amundsen, et al | 32 | Various 67% UII | 94% retention | 9% |
| Goldman | 14 | Midline Incision | 93% | 21% |

Pubovaginal Sling Take-Down

Amundsen, et al, J Urol 164:434, 2000

- 32 women treated by various techniques according to clinical situation
 - Incision of fascial sling if identified (8)
 - Urethrolisis if fascial sling not identified (11)
 - Transvaginal removal of synthetic sling (13)

Sling Take-Down

- Sling incision is a simply technique with low morbidity which is applicable to all types of sling materials
 - Recommended as first line treatment
- When sling cannot be clearly identified, formal urethrolisis is recommended

TVT and Obstruction

- Klutke, et al Urology 58:697, 2001
 - 600 patients
 - Multicenter
 - 17 (2.8%) obstructed requiring take down
 - Mean time 64 days (6-228 days)
 - Simple midline incision
 - 100% success for spontaneous voiding
 - Mean follow up 13 months (12-16)
 - 1 urethral injury
 - 1 (6%) recurrent SUI
- If within 10 days consider “loosing” sling

Obstruction From TVT

- Critical to identify and cut or loosen sling
- Urethrolisis without identifying TVT likely to fail
- In cases of early intervention (up to 14 days) may be able to loosen by pulling down
- After 10-14 days need to incise as TVT is ingrown with native tissue
- Chronically can become a tight band

Technique of Mid Urethral Sling Loosening

- Infiltrate anterior vaginal wall with 1% lidocaine
- Open vaginal suture line
- The sling is identified and hooked with a right-angle clamp
- Spreading of the right angle clamp or downward traction on the tape will usually loosen it (1-2 cm)
- If the tape is fixed, it can be cut
- Reapproximate vaginal wall

TVT Intervention Results

| | <i>N</i> | <i>Type</i> | <i>Success</i> |
|-----------------|----------|------------------|---|
| Klutke, et al* | 17 | Midline Incision | 100% normal emptying |
| Rardin, et al** | 23 | Midline Incision | 100% normal emptying |
| | | Loosening | 30% complete resol. irritative sx 70% partial resol. irritative sx |

* Recurrent SUI in 6%

** Significant recurrent SUI 13%
26% recurrent SUI, but significantly better than prior to TVT

What Happens When Urethrolisis Fails?

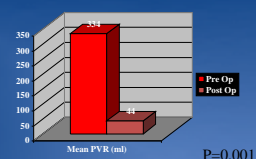
Repeat Urethrolisis

Scarpero, et al, 2002

- 24 women all failed at least one prior urethrolisis
 - All deemed obstructed by a combination of clinical criteria
- All underwent repeat urethrolisis via transvaginal or retropubic route (surgeon's discretion)
 - Aggressive approach taken with complete mobilization of urethra off the pubic bone
 - Mean follow up = 14 months

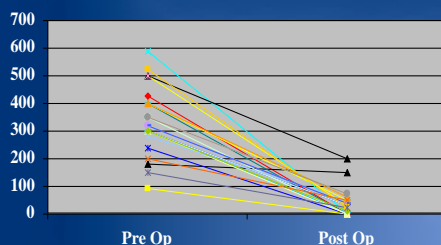
Results Emptying

- Normal emptying with relief of obstructive symptoms in 22/24 (92%)
 - PVR \leq 100 ml
- 20/22 (91%) catheter dependent patients no longer needed to catheterize
- 2 non-catheter dependent patients had PVR = 0



Results Emptying

Post Void Residual (ml)



Results

Urge Incontinence

- 2/16 (12%) complete resolution
- 11/16 (69%) improved, but required anticholinergics
- 3/15 (19%) no improvement

Stress Incontinence

- 4/22 (18%) developed de novo SUI
- 2 had persistent SUI
- 5 women had collagen injection with 4 (80%) improved

“Resuspension” With Urethrolisis

- Not routinely necessary after transvaginal urethrolisis
 - Decision for resuspension can be made at the time of surgery based on operative findings
 - Recurrent SUI rates 0 - 19% if no resuspension
- Consider when there is persistent SUI associated with obstruction
 - “Loose” sling preferred

Resuspension With Urethrolisis

- De novo SUI after urethrolisis without resuspension
 - Foster and McGuire - 0
 - Carr and Webster - 14%
 - Goldman, et al - 23% of successes
 - 66% responded to collagen

Urethrolisis Approach

- Vaginal approaches
 - Usually first approach
 - Quicker recovery
- Retropubic approach
 - After a failed vaginal approach
 - Vaginal surgery contraindicated or not desired
 - Other abdominal or retropubic surgery
 - Complex cases / surgeon’s preference

Flap Interposition With Urethrolisis

- Recommended for all retropubic and infrapubic urethrolisis
- Recommended for redo transvaginal urethrolisis
- If any doubt - do it

Conclusions

- Clinically significant obstruction after incontinence surgery is uncommon, but occurs even in the most experienced hands
- Urethrolysis or sling incision, by a variety of techniques, is successful in restoring emptying and relieving LUTS in the majority of cases

Complications of Prolapse Surgery: Prevention, Evaluation and Management

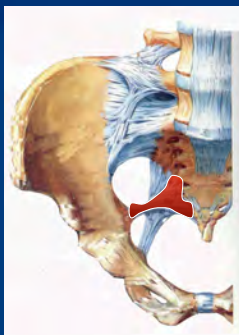
Outline

- Perioperative
- Postoperative
 - Bleeding
 - Infection
 - DVT
 - Voiding dysfunction
 - Pain/Nerve Injury
 - Graft complications

Bleeding

- Incidence depends on definition
- Varies by procedure
- Overall less than 2% require blood transfusion
 - Potential for significant bleeding during SSF

Sacrospinous Ligament



Mild Bleeding

- Not unusual
- For very small bleeders
 - finish procedure - pack
- Larger bleeders
 - cautious cautery
 - oversee with absorbable suture
 - finish procedure and pack

Moderate-Significant Bleeding

- As on prior slide
- If deep in vagina/pelvis may be difficult to access
- Temporary packing
- **Judicious clip placement – Disposable long shaft**

Moderate-Significant Bleeding

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- Judicious clip placement – Disposable long shaft
- **Hemostatic agents – Floseal**

Moderate-Significant Bleeding

- As on prior slide
- If deep in vagina/pelvis may be difficult to access
- Temporary packing
- Judicious clip placement – Disposable long shaft
- Hemostatic agents – Floseal
- **Embolization**

Bladder Injury

- Always try to close with multiple layers
- Straightforward in “traditional” cystocele repair
- If doing deep lateral dissection – mesh kits
 - May be difficult to visualize
 - Reapproximate tissue in that area – may only get one layer
 - Evaluate location of ureters – check for efflux
 - ? If mesh should be placed
 - My personal preference....
- Leave Foley catheter for 7-10 days

Ureteral Injury

- Many not diagnosed at time of surgery
- Delay in diagnosis contributes to morbidity
- At time of surgery can remove sutures and/or stent fairly easily

Ureteral Injury/Obstruction During Plication

- May catch or kink ureters
- 0.5-2%
- Check for ureteral efflux after sutures placed (without pulling too much)/tied
- If necessary remove sutures and redo



Ureteral Injury/Obstruction During Vault Suspension

- Not rare during ureterosacral ligament vault suspension 1-11%
- Ureter not far from USL
 - Stay medial and cephalad
- Check for ureteral efflux after sutures placed – put tension on them
 - I check again at end of case after all tied down
- If no efflux – cut sutures on that side and replace

Ureteral Injury during Dissection

- Unusual
 - More common in stage 4(3?) AVW prolapse
- Can occur with dissection deep to pubocervical fascia
 - Commonly used in synthetic mesh repairs
- Stent/Repair/Reimplant

Avoiding Bladder and Ureteral Injury

- Appropriate Exposure
- Stay in the right plane
 - Synthetic mesh – hydrodissection
 - Trochars – cysto with a 70 angle lens
- For stage 4 (?3) AVW prolapse – consider ureteral catheters
- Cystoscopy to check bladder integrity and ureteral efflux

Rectal Injury

- Can occur during rectocele repair or dissection for vault/enterocele
- Careful dissection
- Know where the rectum is at all times
 - ? Rectal pack?
- More common during repeat rectocele repair
- For SSF – don't try to force retractors into pararectal space – place gently

Postoperative Complications

- Infection
 - UTI – not rare
 - Wound infection
 - Unusual

Prevention of UTI

- Sterile urine pre-op
- Dose of perioperative antibiotics
- Current recs – less than 24 hours antibiotics
- Avoid prolonged catheter use if possible

UTI

- Simple – treat
- Recurrent – Cystoscopy to rule out intravesical stitch/mesh
- If catheter in longer than 24 hours consider one dose of antibiotic at catheter removal

Superficial Wound Infection

- Antibiotics – cipro and flagyl
- Warm baths
- Supportive care

Deep infection

- Pelvic abscess
 - Drain
 - Transvaginally – US guidance
 - Percutaneously – CT guidance
 - Antibiotics

DVT

- Risk of DVT 6-29% if no prophylaxis
 - Recent study suggests lower risk
- Risk Factors
 - Pelvic Surgery
 - Legs in stirrups for extended period of time
 - Advanced age
 - Obesity
- Age above 60 is considered high risk
- Prophylaxis
 - Sequential Compression Devices (SCD)
 - Consider SCD + SQ Heparin in higher risk patients

Post-op Bleed

- Pack
 - Supportive care
- Arteriography
 - Embolize

Vesicovaginal Fistula

- Uncommon after cystocele repair
 - Unrecognized bladder injury at time of repair
 - Inadequate closure/drainage after recognized bladder injury
- More common with mesh repairs
 - Deeper dissection during repair
 - Placement of foreign body

VVF

- No mesh involved
 - Transvaginal repair after tissue healed
 - Usually more distal than typical VVF
 - Easier to access
 - Transabdominal repair if more comfortable with that approach
 - Not necessary to wait 3 months
- Mesh involved
 - Will discuss with intravesical mesh

Ureteral Injury

- Mean delay to dx – 5.6 days Kim JH, Intl Urogyn J, 2006
- Multiple presenting symptoms
 - Incontinence
 - Flank pain
 - Sepsis
 - Ileus
 - 5% “silent” - dx later as non-fxn/hydro kidney
- Typically some CT abnormality noted first
 - Hydroureteronephrosis down to pelvis

Ureteral Injury

- Cysto, retrograde, stent
 - Suture removal often necessary
- Percutaneous nephrostomy
 - Antegrade stent
- Reimplant
 - Usually at a later date – after stent/nephrostomy

Pain

- Dyspareunia
 - Posterior repair
 - Vaginal stenosis
 - Ridging in posterior wall
- Mesh
 - Local tenderness
 - Forniceal/arm pain
- Nerve pain
 - Positioning – use padding and position carefully
 - Nerve entrapment

“Nerve Pain”

- Can occur with deep bite of USL
- Buttock pain in 10-15% of SSF suspension
 - May be due to nerve within SSF-coccygeous
 - Usually temporary
 - Anti-inflammatories/time
- Rare cases may require stitch removal

Lowenstein L, et al, Intl Urogyn J, 2007

Graft Complications

- Biologic versus Synthetic

Biologic Graft Complications

- Infections/Fluid collections
 - Usually spontaneously drain
- Extrusion/Wound healing
 - May reepithelialize
 - May require removal

Synthetic Graft Complications

- Pain
- Vaginal Extrusion
- Intravesical Erosion
- Rectal Erosion

Pain – Fornix/Groin

- 2-5 %
- Often due to taut arm of mesh
 - Can usually palpate taut band in fornix
- Prevention – leave a bit of laxity
- Treatment
 - Anti-inflammatories
 - Local injection
 - Incision of arm

Incision of Arm

- Palpate arm
- Inject local in fornix
- Incise over arm
- Get around arm
- Incise arm

Pain At Body of Mesh

- Initial conservative management
- If persists remove
 - If not extruded – important to map out the exact areas of tenderness to make sure those areas are removed at time of surgery



Mesh Extrusion

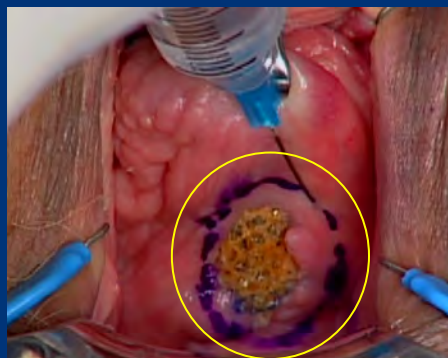
- 3-15% - depending on series
- Prevention
 - Pre-op hormonal cream
 - Dissect and place deep to pubocervical fascia
 - Ensure mesh lays flat
 - Avoid excessive vaginal wall trimming

Mesh Extrusion - Management

- Observation – if not sexually active and not symptomatic
- Hormonal cream – I have not had much luck
- Trim in office – very small exposures
- Remove in OR

Removal of Mesh

- Decision of whether to remove just localized area of mesh vs all mesh
 - Based on sx's, pain, etc
- Infiltrate with lidocaine with epinephrine
- Excise skin edges
- Undermine and remove mesh 1 cm from skin edges
- Utilize sharp and blunt dissection
 - Kitner/peanut
- Posterior – may benefit from finger in rectum
- Close vaginal skin



Experience with Mesh Removal

- Avg age – 60
- Prior medical tx – 84%
- Latency to presentation 17 wks (0-96)
- Indication for removal
 - Symptomatic mesh erosion 12 (63)
 - Recurrent pelvic organ prolapse 8 (42)
 - Chronic pain 6 (32)
 - Dyspareunia 6 (32)
 - Vesicovaginal fistula 3 (16)
 - Multiple indications 16 (84)

Ridgeway B, Am J Obs Gyn, 2008

Experience with Mesh Removal

79% excised transvaginally
 Follow up – 16-75 weeks
 Pain scores – 0 (0-8 scale)
 87% free of presenting symptoms

Ridgeway B, Am J Obs Gyn, 2008

Intravesical Mesh Erosion

- May be associated with VVF
- Can approach abdominally or transvaginally
- Most have reported a transabd approach

Intravesical Mesh Erosion

- May be associated with VVF
- Can approach abdominally or transvaginally
- Most have reported a transabd approach
- **I prefer transvag approach**
 - Good exposure
 - Minimal morbidity
 - Can remove almost all of mesh under bladder

Transvaginal Excision of Intravesical Mesh

- Determine where mesh is – cysto/palpation
- Bilateral ureteral catheters
- U flap in vaginal wall
- Identify mesh or cut through detrusor till get to mesh
- Cut mesh in midline
- Dissect overlying tissue off of mesh
- Dissect underlying mucosa/detrusor from mesh
- Excise mesh laterally
- Close mucosa
- Close multiple detrusor layers
- Close U flap – vaginal skin
- Foley for 2 weeks

Firoozi F and Goldman HB, Urology, 2010

Complications of POP Surgery

- Perioperative
- Postoperative
 - Bleeding
 - Infection
 - DVT
 - Voiding dysfunction
 - Pain/Nerve Injury
 - Graft complications

Complications of POP Surgery

- Prevention is the best treatment
- Identify at time of surgery – lowest morbidity if dealt with then
- Mesh repairs have introduced a number of new potential complications
- Even with significant complications – most patients can be treated with minimal residual morbidity
- Key is identifying problem and knowing how to deal with it

Dyspareunia Following Prolapse Surgery

Objectives

- To develop an understanding of the possible etiologies of dyspareunia
- Explore the literature on dyspareunia related pelvic surgery related
- Construct strategies to avoid de novo post-operative dyspareunia
- Evaluate dyspareunia treatment plans- who, what, when and where?

Dyspareunia Etiology

- Landscape
- Nerves
- Muscles
- Mind
- Men



Landscape of the vulva and vagina

- Vaginal narrowing
- Disruption of healing/ erosion
- Health of vaginal mucosa

How do you determine the width of the vagina at the conclusion of prolapse surgery?

Vaginal Dimensions

- Vaginal length and caliber decreases significantly
- No correlation with sexual function and vaginal dimensions
- Dyspareunia increases in women undergoing prolapse surgery (8% Vs. 19%)
- Sexual satisfaction improved with sexual function (82% Vs. 89%)

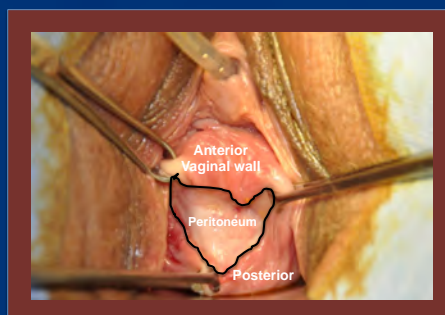
Weber, 2000

Vaginal Dimensions

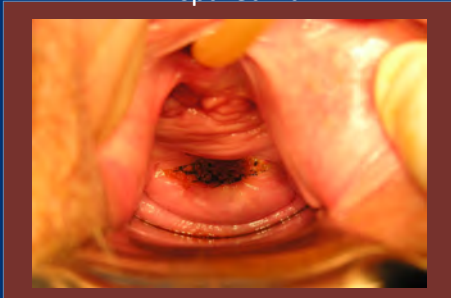
- Dilators
- Estrogen
- Physical therapy
- Surgery
 - Fenton's procedure
 - Vaginal flap advancement



Landscape: Disruption of Healing



Landscape: Disruption of Healing Dyspareunia



Landscape: Disruption of Healing Erosion

- Healing
 - Vascularization
 - Collagen formation
 - Age
 - Obesity
 - Smoking
 - Estrogen status
 - Immune status
 - Avoidance of hematoma and infection

Araco et al. 2009

Prospective Clinical Assessment of the Transvaginal Mesh Technique for Treatment of Pelvic Organ Prolapse- 5 Year Results

| Complication | Number affected (N=66/85) | % affected | Surgical intervention N (%) |
|------------------------|------------------------------|------------|-----------------------------------|
| Mesh erosion | 15 | 17.6% | 7 (8%) |
| De novo dyspareunia | 3 | 3.5% | |

Miller, D et al. *Female Pelvic Med Reconstr Surg*. 2011, 17(3):139-43

Landscape: Disruption of Healing Late Erosion

- More common in sexually active women (17.3% Vs. 2% respectively)- OR 10.47
- Kaufman 2011

Landscape: Disruption of Healing Treatment of Erosion

- Micro-erosion
 - Estrogen cream
 - Colposcope may be helpful to identify and cut mesh
- Macro-erosion
 - Estrogen cream
 - Excision with vaginal flap advancement
 - Combination

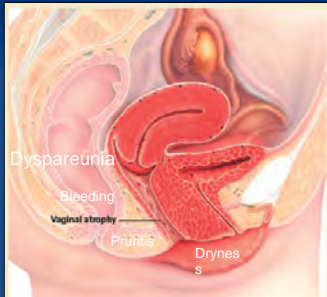
Landscape: Vaginal Mucosa

- Vaginal infections
 - Candida, BV, STD
- Systemic disorders
 - Crohn's disease, diabetes, dermatoses
- Allergic reactions
 - Topical agents, soaps, douches, perfumes
- Neoplasms
 - VIN
- Psychogenic

Chervenak JL. *Sem Reprod Med* 2010;28:380-87.

Landscape: Vaginal Mucosa

- Affects 10-40% of postmenopausal women
- Vaginal preparations more effective than oral in relief of vulvovaginal symptoms



Source: Anatomical Chart Company, Diseases A-Z, 3rd ed. Dublin, IL: Western Chiropractic; Williams & Wilkins, 2005.

Landscape: Vaginal Atrophy Treatment

- 2006 Cochrane Review
- 19 trials, 4162 women
 - Estradiol most effective in symptomatic relief
 - CEE most impact on cytological change and serum levels of estradiol
- Patient preference (11 studies):
 - Estradiol ring is the most preferred



Landscape: Vaginal Mucosa Treatment of Atrophy

- Estrogen
- Vaginal lubricants
- Foreplay
- Regular sexual activity

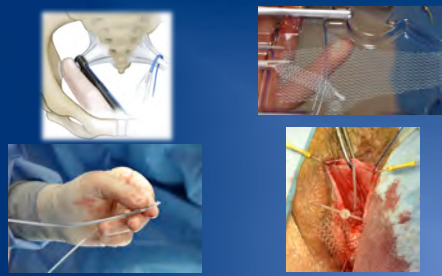
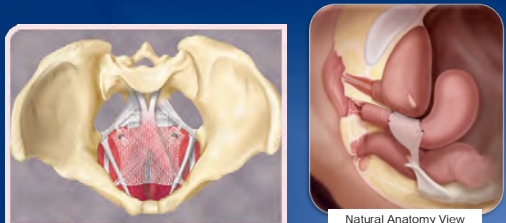


Abdominal Sacrocolpopexy Vs Sacrospinous Ligament Fixation

- Randomized trial (N=95)
- Impact of sexual function secondary outcome
- Dyspareunia resolved in:
 - SSLF- 3/7 women
 - ASC 5/9 women
- Dyspareunia developed in:
 - SSLF- 3 women
 - ASC- 2 women
- 1/20 (5%) sexually active women developed postoperative dyspareunia due to mesh erosion

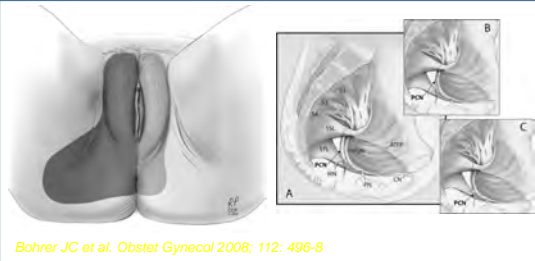
Maier CR et al. American Journal of Obstetrics and Gynecology (2004) 190, 20e6

"Trocarless" Placement

Natural Anatomy View

Pelvic Pain Following Vaginal Mesh Placement



Bohrer JC et al. *Obstet Gynecol* 2008; 112: 496-8

De novo dyspareunia estimated to be at least 3%

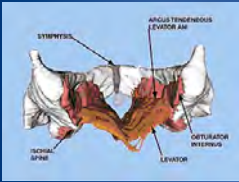
Mesh Kits: Tricks



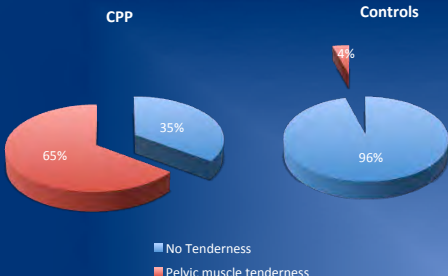
- Thick vaginal flaps
- Avoid tension
- Avoid “bunching” of mesh
- Use vaginal estrogen prior to and after surgery
- Know your anatomy, mesh and what to do if you have a complication

Muscles: Vaginismus

- Affects 1-7% of world’s population



Evaluation of Pelvic Floor Muscles



| Group | No Tenderness | Pelvic muscle tenderness |
|----------|---------------|--------------------------|
| CPP | 35% | 65% |
| Controls | 96% | 4% |

Montenegro M et al. *Pain Medicine* 2010;11:224-8

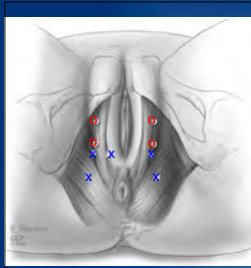
Pelvic Floor Muscles Treatment

- Dilators
- Physical therapy
- Trigger point injection-
- Botulinum toxin type A



Muscles: Botulinum toxin type A injections

- 10 Units at 5 sites
- 1 month later-
- 10 Units at 4 sites





Park and Paraiso *Obstet Gynecol.* 2009;114:484-487

Mind: It's all in their head

- Complexity of female sexual dysfunction
 - Physical health of both people
 - Emotional health
 - Body Image
 - Partner's reaction to prolapse and surgery
 - Intimacy of their relationship


Mind: Psychological factors

- Increase the likelihood of experiencing dyspareunia
 - Depression
 - Anxiety

Men: Erectile dysfunction


- Most men >45 years of age have ED at least some of the time
- Projected to affect 322 million men worldwide by 2025
- Severity and prevalence increase with age



Levine S et al. J Androl. 2011;33:154-61


Men: Treatment of Erectile Dysfunction

- Physical activity
- Mediterranean diet
- Weight loss
- Smoking cessation
- Evaluation of current medications





Men: Treatment of Erectile Dysfunction

- PDE5I
- vacuum erectile device (VED),
- intraurethral medication,
- intracavernosal injection (ICI),
- androgen supplement,
- α -blocker
- combinations



Men: Treatment of Erectile Dysfunction

- PDE5I
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- combinations

Prevention: How can we avoid it?

- Pick the right patient
- Pick the right procedure
 - Are there procedures we should avoid?
 - Do we know?
 - What directions do we need to follow to answer our questions
- Perform the procedure correctly
- Preoperative counseling

Conclusions: Dyspareunia Happens

- Evaluation
 - Severity
 - Time course
 - Location

Moderate- Severe
Remove the sutures as quickly as possible

Mild – Moderate
(getting better???)
Reassurance
Trigger point injection



Dyspareunia Happens

- Treatment plan
 - If severe- be aggressive
 - Evaluate etiology
 - Treat with
 - Estrogen
 - Dilators
 - Injections
 - Surgery
 - Lean on associates
 - » Physical Therapy
 - » Sexual counseling




Conclusions: Counseling

- Multidisciplinary Options
 - Preoperative counseling
 - Treat the underlying pain
 - Sexual counseling
 - Physical therapy
 - Treat atrophy

Complications of Incontinence and Prolapse Surgery: Evaluation, Intervention, and Resolution—A Review from Both Specialties

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