Endometriosis of the Urinary Tract

COLIN LUNDEEN AND DR. PAUL YONG
SEP 20, 2017

Objectives

- Review the background, epidemiology and pathophysiology of urinary tract endometriosis (UTE)
- Outline the clinical presentation and workup of UTE
- Present the treatment options for UTE including hormonal and surgical interventions
- Highlight operative cases from VGH involving collaboration between Gynecology and Urology
Background

Endometriosis: the presence of endometrial glands and stroma outside of the uterus
- Prevalence: 6-10% in women of reproductive age, up to 50% among women with infertility
- Three main categories:
  - Ovarian endometriosis
  - Superficial peritoneal endometriosis
  - Deep infiltrating endometriosis (DIE)

Deep infiltrating endometriosis (affects ~1% of women of reproductive age)
- Infiltrates the peritoneum by > 5mm
- Common sites include: bladder, ureter, rectovaginal septum, rectum, retrosigmoid colon, uterine ligaments, vagina

Epidemiology

- 1% of patients with pelvic endometriosis have urinary tract involvement
- 20-50% of patients with Deep Infiltrating Endometriosis have urinary tract involvement
- Prevalence at specific sites:
  - Bladder 70-85%
  - Kidney 4%
  - Urethra 2%
  - Ureter 9-23%
    - Extrinsic (80%) – submucosa or adventitia
    - Intrinsic (20%) – mucosa or muscularis propria
- Risk factors:
  - Nulliparity, prolonged exposure to endogenous estrogens (early menarche, late menopause), short menstrual cycles (<27 days), family history, heavy menstrual bleeding, dysmenorrhea, obstruction of menstrual outflow, height > 68in, low BMI, high consumption of trans unsaturated fats
Pathophysiology

Theories include:

• Retrograde menstruation
  • Most lesions are in the pelvis, in dependent areas – lower ureter more affected than upper ureter
  • Left side deposits are more common – “anatomic sheltering” by the sigmoid colon
  • Bladder is involved far less when uterus is retroverted

• Altered immunity
  • Dysregulation of immune system leads to poor clearance of ectopic endometrial cells
  • Higher incidence in patients with auto-immune and atopic diseases

• Coelomic metaplasia - Normal peritoneum transforms into endometrial tissue

• Mullerian rest transformation* – stimulated by estrogen exposure

• Benign metastasis – hematological/lymphatic spread

• Iatrogenic – port site and scar site lesions

• Genetic modification – early studies only with no definitive findings

Nezhat et al, Nature Rev Urol 2017

Biological Alterations in DIE

• Upregulation of estrogen biosynthesis

• Decreased inactivation of estrogen

• Alteration of estrogen and progesterone receptors
  • Leads to resistance of endometrial tissue to progesterone’s anti-proliferative effect

• Higher expression of invasive mechanisms (matrix metalloproteinases and activins)

• Increased expression of neuroangiogenesis genes
  • Vascular endothelial growth factor (VEGF), Nerve growth factor (NGF),

Ferrero et al, Fertil Steril 2015
Pain in DIE

- Pain in DIE is not simply from compression/mass effect
- Lesions are directly innervated by sensory and sympathetic fibers
- Increased number of activated mast cells
  - Cytokine release
  - Immune mediated inflammatory response
- Increased nerve density
  - correlates directly to severity of pain
  - Upregulation of nerve growth factor (NGF) by local inflammatory response

Ferrero et al, Fertil Steril 2015

Presentation

- Severe pain: >95%\(^1\)
  - Dysmenorrhea, deep dyspareunia, non-menstrual pelvic pain
- Prevalence of LUTS in UTE is unclear: 2-77% in reported studies\(^2\)
  - Dysuria: 21-69%
  - Hematuria: 0-35%
- Ureteral lesions are often asymptomatic
  - Silent loss of renal function in 25-50%\(^3\)
  - Often discovered incidentally during laparoscopy
  - Rectovaginal lesions >3cm predict ureteral lesions\(^4\) (OR 3.92, 95% CI 1.84-8.34, P<0.001)
- Significant crossover between UTE and other chronic pain syndromes
  - Overactive bladder, interstitial cystitis/chronic pelvic pain, bladder cancer
- Bowel involvement may lead to associated symptoms
  - Constipation, dyschezia, menstrual diarrhea, menstrual hematochezia

1 Berlanda et al, Eur J Obstet Gynecol Reprod Bio 2017
2 Maggiore et al, Eur Urol 2017
4 Knabben et al, Fertil Steril 2015
Evaluation

- History
  - Symptoms, localization of pain, cyclical nature, questionnaires
- Physical Exam
  - Bimanual exam
- Laboratory Investigations
  - CBC, Creatinine, Urinalysis/culture
- Imaging
  - Ultrasound
  - MRI
  - IVP
- Procedures
  - Laparoscopy
  - Cystoscopy
  - Ureteroscopy
Evaluation: Bladder

- Transvaginal Ultrasound
  - Sensitivity 0.62 (95% CI 0.4-0.8)
  - Specificity 1 (95% CI 0.97-1)
  - Positive likelihood ratio 208.4 (95% CI 21-2066)
  - Able to more accurately detect distance from lesion to ureteric orifice than MRI
  - Less expensive, easier access than MRI

- MRI
  - Sensitivity 0.64 (95% CI 0.48-0.77)
  - Specificity 0.98 (95% CI 0.96-0.99)
  - Improved resolution, better tissue characterization, better multiplanar capability

1 Guerriero et al. Ultrasound obstet gynecol 2015
2 Thonnon et al. J Minim Invas Gynecol 2015
3 Medeiros et al. Arch Gynecol Obstet 2015
4 Mallampati et al. MRI Clin J N Am 2004

Evaluation: Bladder

- Cystoscopy
  - Usually normal due to majority of lesions not invading the mucosa
  - Best to perform immediately before or during menstruation
  - Utilized preoperatively to determine distance from lesion to ureteric orifice

- Urodynamics
  - Increased bladder sensation and painful bladder filling comparing BE to other DIE lesions

Panel et al. Int Urogynecol J 2016
Evaluation – Bladder Summary

<table>
<thead>
<tr>
<th>Approach</th>
<th>Pros</th>
<th>Cons</th>
<th>Comments</th>
<th>LE</th>
<th>GR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical examination</td>
<td>Noninvasive</td>
<td>Experience required to achieve accuracy</td>
<td>Allows detection of a bladder nodule that may be painful (53–100%)</td>
<td>Ib</td>
<td>B</td>
</tr>
<tr>
<td>Questionnaires</td>
<td>Cost-effective, accurate for BE diagnosis, detailed description of LUTS</td>
<td>Time-consuming</td>
<td>Can be useful in improving diagnosis of and monitoring changes in LUTS after medical/surgical treatment</td>
<td>Ib</td>
<td></td>
</tr>
<tr>
<td>TVS</td>
<td>Highly accurate, noninvasive, cost-effective, estimation of the distance between ureteral orifices and nodule borders</td>
<td>–</td>
<td>First-line technique for BE diagnosis</td>
<td>la</td>
<td>A</td>
</tr>
<tr>
<td>MRI</td>
<td>Highly accurate</td>
<td>Not-cost-effective</td>
<td>Should not be routinely performed in clinical practice</td>
<td>la</td>
<td>A</td>
</tr>
<tr>
<td>Cystoscopy</td>
<td>Cost-effective, estimation of the distance between ureteral orifices and nodule borders, biopsy</td>
<td>Invasive</td>
<td>Should not be performed routinely, only in cases of suspicion of malignancy or to estimate the distance between ureteral orifices and nodule borders if not clearly evaluable by TVS</td>
<td>IV</td>
<td>D</td>
</tr>
<tr>
<td>Urodynamics</td>
<td>Objective assessment of lower urinary tract changes</td>
<td>Invasive, time-consuming</td>
<td>Should only be used for scientific purposes</td>
<td>III</td>
<td>C</td>
</tr>
</tbody>
</table>

Maggiore et al, Eur Urol 2017

Evaluation: Ureter

- Ultrasound
  - Able to detect hydronephrosis/hydroureter

- MRI
  - Sensitivity and specificity comparable to laparoscopy for detecting intrinsic ureteric lesions¹
  - “ideal” imaging modality for urinary tract involvement²

- IVP
  - Traditional imaging modality
  - Can provide location of lesion, degree of stenosis, presence of hydronephrosis
  - Retrograde pyelogram can be substituted if IV contrast is contraindicated

- Nuclear medicine
  - MAG-3 or DMSA to look at split function – is the kidney worth salvaging?

- Ureteroscopy
  - Only useful for diagnosis of intrinsic ureteral lesions

¹ Sillou et al. Diagn Interv Imaging 2015
² Maccagnano et al. Urol Int 2013
Evaluation: Ureter

**Figure 1**

Correlation between the size of the rectovaginal nodule and the probability of ureteral involvement. [Kranzler, Urinary tract endosonography. Am J Obstet Gynecol 2015.]

**Table 2. Comparison of patients requiring and not requiring urologic surgical intervention**

<table>
<thead>
<tr>
<th>Preventing symptoms</th>
<th>Extensive Surgical Intervention (n = 15)</th>
<th>Minimal or No Surgical Intervention (n = 67)</th>
<th>OR (P Value, 95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary symptoms</td>
<td>5 (33.3)</td>
<td>4 (6.0)</td>
<td>7.88 (P = .002, 1.80–34.40)</td>
</tr>
<tr>
<td>Urinary urgency</td>
<td>1 (6.7)</td>
<td>1 (1.5)</td>
<td>0.40 (P = .469, 0.057–3.314)</td>
</tr>
<tr>
<td>Oligomenorrhea</td>
<td>3 (20.0)</td>
<td>17 (25.4)</td>
<td>0.74 (P = .661, 0.192–2.92)</td>
</tr>
<tr>
<td>Pelvic pain</td>
<td>5 (33.3)</td>
<td>26 (38.6)</td>
<td>0.79 (P = .693, 0.242–2.57)</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>6 (40.0)</td>
<td>33 (48.6)</td>
<td>0.77 (P = .690, 0.252–2.42)</td>
</tr>
<tr>
<td>Vaginal pain</td>
<td>5 (33.3)</td>
<td>7 (10.4)</td>
<td>4.29 (P = .023, 1.14–14.18)</td>
</tr>
<tr>
<td>Bock pain</td>
<td>0 (0.0)</td>
<td>2 (3.0)</td>
<td>0.00 (P = .915, 0.000–NA)</td>
</tr>
<tr>
<td>Abnormal uterine bleeding</td>
<td>3 (20.0)</td>
<td>21 (31.3)</td>
<td>0.55 (P = .383, 0.14–2.15)</td>
</tr>
<tr>
<td>Asymptomatic</td>
<td>0 (0.0)</td>
<td>6 (9.0)</td>
<td>0.00 (P = .402, 0.000–NA)</td>
</tr>
<tr>
<td>Physical examination findings</td>
<td>Abdomen/Pelvis tender to palpation</td>
<td>3 (20.0%)</td>
<td>0.48 (P = .281, 0.12–2.87)</td>
</tr>
<tr>
<td>Abdomen/Pelvis mass</td>
<td>2 (13.3%)</td>
<td>26 (38.8%)</td>
<td>0.24 (P = .061, 0.05–1.63)</td>
</tr>
<tr>
<td>Laboratory findings</td>
<td>Mean ± SD (range)</td>
<td>Mean ± SD (range)</td>
<td></td>
</tr>
<tr>
<td>CO2</td>
<td>0.92 ± 0.13 (0.0–1.33)</td>
<td>0.76 ± 0.13 (0.0–1.31)</td>
<td>P = .20</td>
</tr>
<tr>
<td>Average WBC</td>
<td>9.07 ± 4.62 (2.9–19.0)</td>
<td>7.80 ± 2.36 (3.6–16.5)</td>
<td>P = .14</td>
</tr>
<tr>
<td>Imaging findings</td>
<td>Abdominopelvic mass</td>
<td>2 (13.3%)</td>
<td>0.24 (P = .061, 0.05–1.63)</td>
</tr>
<tr>
<td>Hydronephrosis</td>
<td>13 (86.7%)</td>
<td>5 (7.8%)</td>
<td>76.70 (P = .001, 11.38–439.70)</td>
</tr>
</tbody>
</table>

O2 confidence interval; Cr, creatinine; OR, odds ratio; WBC, white blood cell count.

* Percentage calculation based on 64 patients as 3 had unknown preoperative hydronephrosis status.

Gennaro et al, UROLOGY 2017
### Evaluation: Ureter

**Table 2**

Proposal for a classification of ureteral endometriosis.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Peritoneal endometriosis overlying the ureter</td>
</tr>
<tr>
<td>1</td>
<td>Retroperitoneal endometriosis with entanglement of the ureter but no dilatation</td>
</tr>
<tr>
<td>2</td>
<td>Dilatation of the ureter and/or hydronephrosis without functional impairment (urodynamic no relevant obstruction)</td>
</tr>
<tr>
<td>3</td>
<td>Urodynamically relevant obstruction with symmetrical renal split clearance in renal furosemide scintigraphy and normal total clearance</td>
</tr>
<tr>
<td>4</td>
<td>Urodynamically relevant obstruction with impaired split clearance in renal furosemide scintigraphy or impaired total clearance</td>
</tr>
<tr>
<td>5</td>
<td>Silent kidney</td>
</tr>
</tbody>
</table>


### Medical Management

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pros</th>
<th>Cons</th>
<th>Comments</th>
<th>Grade of recommendations for DEE treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonsteroidal anti-inflammatory drugs</td>
<td>Cost-effective; Not contraceptive</td>
<td>No cytostatic effect; Only one randomized controlled trial has been published</td>
<td>N/A; No studies available</td>
<td>A</td>
</tr>
<tr>
<td>Progestogens</td>
<td>Cost-effective; Effective in improving pain symptoms Available in different formulations (oral, intravaginal, implant); Wall tolerated</td>
<td>Contraceptive for women deciding to conceive</td>
<td>First-line therapy</td>
<td>A</td>
</tr>
<tr>
<td>Combined hormonal contraceptives</td>
<td>Cost-effective; Effective in improving pain symptoms Available in different formulations (oral, vaginal, cutaneous); Wall tolerated</td>
<td>Contraceptive for women deciding to conceive</td>
<td>First-line therapy</td>
<td>A</td>
</tr>
<tr>
<td>Gonadotropin releasing hormone agonists</td>
<td>Highly effective in improving pain symptoms Available in different formulations (intrasyn, IN, SC)</td>
<td>Short-term use (6 mo) without add-back therapy; Hypogonadal AI less; Expensive; Contraceptive for women deciding to conceive</td>
<td>Second-line therapy</td>
<td>B</td>
</tr>
<tr>
<td>Danazol</td>
<td>Cost-effective; Effective in improving pain symptoms</td>
<td>Androgenic AI, used for barrier contraception</td>
<td>Low popularity due to their androgenic AIs</td>
<td>B</td>
</tr>
<tr>
<td>Aromatase inhibitors</td>
<td>Generally effective in improving pain symptoms in combination with hormonal contraceptives, progestogens, or GnRH agonists</td>
<td>Off-label; High rate of hypogonadal AIs; Short-term use (6 mo)</td>
<td>To be used only in patients refractory to conventional therapies and in the setting of scientific research</td>
<td>B</td>
</tr>
<tr>
<td>Surgery</td>
<td>Highly effective in improving pain symptoms</td>
<td>Intravaginal complications; Expensive</td>
<td>To be considered in patients refractory to hormonal treatment; Second-/third-line therapy</td>
<td>A</td>
</tr>
</tbody>
</table>

Ferrero et al. Fertil Steril 2015
Medical Management: Volume reduction

Ferrero et al. Arch Gynecol Obstet 2013

Medical Management: Cystoscopic Findings

Fedele et al. Fertil Steril 2008
Medical Management: Volume, Pain and Hematuria

![Medical Management: Ureteric Obstruction](image)

**Table 2. Clinical and US data at the beginning of the treatment and at follow-up in the six patients.**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chronic pain (total score)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 0</td>
<td>10</td>
<td>9</td>
<td>11</td>
<td>10</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Month 3</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Month 12</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Bladder nodule volume (cm^3)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 0</td>
<td>5.49</td>
<td>11.76</td>
<td>1.67</td>
<td>4.18</td>
<td>2.87</td>
<td>7.32</td>
</tr>
<tr>
<td>Month 3</td>
<td>2.51</td>
<td>8.02</td>
<td>1.4</td>
<td>3.54</td>
<td>1.89</td>
<td>4.58</td>
</tr>
<tr>
<td>Month 12</td>
<td>2.61</td>
<td>7.85</td>
<td>1.5</td>
<td>3.83</td>
<td>2.10</td>
<td>3.85</td>
</tr>
<tr>
<td><strong>Dysuria (Y/N)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 0</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Month 3</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Month 12</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Haematuria (Y/N)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 0</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Month 3</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Month 12</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td></td>
</tr>
</tbody>
</table>

Angione et al, Gynecol Endocrinol 2015
### Medical Management: Side Effects

<table>
<thead>
<tr>
<th>Treatment (reference)</th>
<th>Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progestogens</td>
<td></td>
</tr>
<tr>
<td>Methylenedioxynestosterone acetate (9–100)</td>
<td>Weight increase (5%), amenorrhea (17%), nausea (11%)</td>
</tr>
<tr>
<td>Cyproterone acetate (107, 108)</td>
<td>Spotting (1%), breakthrough bleeding (7%), swelling (52%), weight increase (19%)</td>
</tr>
<tr>
<td>Desogestrel (107)</td>
<td>Spotting (1%), injection site reactions (1%), breast tenderness (2%)</td>
</tr>
<tr>
<td>Ethinyl (92, 92A–111)</td>
<td>Injection site reactions (1%), breast tenderness (2%)</td>
</tr>
<tr>
<td>Norethindrone acetate</td>
<td>Injection site reactions (1%), breast tenderness (2%)</td>
</tr>
<tr>
<td>Levonorgestrel-releasing intrauterine system (112–114)</td>
<td>Injection site reactions (1%), breast tenderness (2%)</td>
</tr>
<tr>
<td>Combined hormonal contraceptives</td>
<td>Injection site reactions (1%), breast tenderness (2%)</td>
</tr>
<tr>
<td>Vaginal ring and transdermal patch (103, 121)</td>
<td>Injection site reactions (1%), breast tenderness (2%)</td>
</tr>
<tr>
<td>GnRH agonists (122–132)</td>
<td>Injection site reactions (1%), breast tenderness (2%)</td>
</tr>
<tr>
<td>Aromatase inhibitors (133)</td>
<td>Injection site reactions (1%), breast tenderness (2%)</td>
</tr>
<tr>
<td>Danazol (134)</td>
<td>Injection site reactions (1%), breast tenderness (2%)</td>
</tr>
</tbody>
</table>

Ferrero et al, Fertil Steril 2015

### Medical Management: Bladder

<table>
<thead>
<tr>
<th>Medical treatment</th>
<th>First-line therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined hormonal contraceptives and progestogens</td>
<td>Contraceptive for women desiring to conceive</td>
</tr>
<tr>
<td>GnRH-a</td>
<td>Generally effective in improving symptoms, available in different formulations (oral, cutaneous, intrauterine device, implants), well tolerated</td>
</tr>
<tr>
<td>Aromatase inhibitors</td>
<td>Generally effective in improving symptoms in combination with hormonal contraceptives, progestogens</td>
</tr>
</tbody>
</table>

Maggiore et al, Eur Urol 2017
Surgical Management

• Bladder
  • Options
    • Bladder shaving for partial thickness lesion
    • Transurethral resection (rarely used)
    • Partial cystectomy +/- TUR
  • Principles
    • Excision of entire lesion with bladder preservation
    • Prolonged drainage (10 days) +/- cystogram
    • Ureteric stent if lesion within 2cm of ureteric orifice

• Ureter
  • Options
    • Ureterolysis
    • Ureteroureterostomy
    • Ureteroneocystostomy
    • Nephrectomy
  • Principles
    • Ureteral preservation where possible
    • Prolonged ureteric stenting

Surgical Management: Bladder

<table>
<thead>
<tr>
<th>Surgical treatment</th>
<th>TUR</th>
<th>Partial cystectomy</th>
<th>Combined TUR and partial cystectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimally invasive, fast recovery (day surgery)</td>
<td>Incomplete lesion removal, persistence of symptoms, risk of bladder perforation</td>
<td>Complete lesion removal, concomitant treatment of other endometriotic lesions, very low risk of disease and symptoms recurrence</td>
<td>Complete lesion removal, concomitant treatment of other endometriotic lesions, very low risk of disease and symptoms recurrence</td>
</tr>
<tr>
<td>Scanty evidence supports this technique that should be used just in combination with partial cystectomy</td>
<td>Risk of inadvertent removal of healthy bladder muscle</td>
<td>Simple and safe technique with excellent long-term efficacy</td>
<td>Scanty literature based on only case reports</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Combines the advantages of both techniques</td>
</tr>
</tbody>
</table>

Maggiore et al, Eur Urol 2017
Surgical Management: Bladder

• 25 patients
• Laparoscopic partial cystectomy
  • Cystoscopic assist
  • Use of transvaginal manipulation
• Mean size of lesion 2.75cm
• Mean OR time 138 minutes
• Mean hospital stay 1 night
• No recurrence (32 months follow up)

Rafael Manoel Vinícius Stopiglia 1, Ubirajara Ferreira 4, Daniel Gustavo Faundes 5, Carlos Alberto Petta 3

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Surgical Management: Bladder

Group A studies involving varied laparoscopic surgical techniques (87% required only ureterolysis)

Group B studies including only ureteroneocystostomy

Stopiglia et al, Int Braz J Urol 2017

Surgical Management: Ureter

Group A

Major complications
- Ureteral fistula/stenosis
- Hemorrhage
- Bowel anastomotic leak
- Bowel perforation
- Bladder atony
- Vesicovaginal fistula

Surgical Management: Recent Studies

Surgical Outcomes of Urinary Tract Deep Infiltrating Endometriosis
Basma Darwish, MD, Emanuela Stochino-Lei, MD, Geoffrey Pasquier, MD, Fabrice Dagardes, MD, Guillaume Defortescu, MD, Carole Abo, MD, and Horace Roman, MD, PhD

- 81 patients: 39 bladder, 31 ureter, 11 both
- Treatment
  - Bladder: 70% partial cystectomy, 30% bladder shaving
  - Ureter: 78% ureterolysis, 22% primary resection,
  - no nephrectomies
- Complications (≥ Clavien-Dindo Gr III):
  - Bladder 8%
  - Ureter 16%
  - No recurrences

Darwish et al, J Minim Invasive Gynecol 2017

Surgical Management: Recent Studies

Management of ureteral endometriosis with hydronephrosis: Experience from a tertiary medical center
Jing-Zhi Huang, Hong-Ling Guo, Jin-Bo Li and Shu-Qin Chen
Department of Gynecology and Obstetrics, The First Affiliated Hospital of Sun Yat-sen University, Guangzhou, China

- 46 patients with hydronephrosis
- Intrinsic ureteral endometriosis
  - 73% if severe hydro
  - 17% if mild hydro
- Treatment
  - Ureterolysis 24%
  - Ureteroureterostomy 9%
  - Ureteroneocystostomy 61%
  - Nephrectomy 6%
- Complications in 20%
- Resolution of hydro at 6 months in 85%

Huang et al, J Obstet Gynaecol Res 2017
Surgical Management: Recent Studies

Laparoscopic Management of Ureteral Endometriosis and Hydronephrosis Associated With Endometriosis

João Alves, MD*, Marco Puga, MD, Rodrigo Fernandes, MD, Anne Pinton, MD, Ignacio Miranda, PhD, Elias Kervoel, MD, and Arnaud Wautier, PhD

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• 198 patients (28 with hydronephrosis)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Patients with hydronephrosis</th>
<th>Patients without hydronephrosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ureterolysis</td>
<td>15/28 (54%)</td>
<td>162/170 (95%)</td>
</tr>
<tr>
<td>Ureteroureterostomy</td>
<td>12/28 (43%)</td>
<td>8/170 (5%)</td>
</tr>
<tr>
<td>Ureteroneocystostomy</td>
<td>1/28 (3%)</td>
<td>0</td>
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</tbody>
</table>

• Complications in 10%
  • No difference between ureterolysis and ureteroureterostomy
  • Recurrence in 19%

Conclusions

• Urinary tract endometriosis is more common than originally thought, particularly in patients with deep infiltrating endometriosis
• Patients with urinary tract endometriosis often present without lower urinary tract symptoms
• Ultrasound is the preferred initial imaging modality over MRI for urinary tract endometriosis
• Medical management, with progestogens (Dienogest) or combined hormonal contraceptives, are the first line treatment options
• Surgical management with laparoscopy provides excellent outcomes for patients who fail or have contraindications to medical therapy
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Case 1

- 36 year old G0
- Focal nodular hyperplasia vs. Hepatic adenoma
- Cyclical pelvic pain and hematuria
- Previous cystoscopic biopsy of bladder mass
- Exam: Rectal nodule (14mm)
- Ultrasound: Bladder nodule (35mm)
Case 1

• OR
  • MIS excision of rectal nodule
  • Cystoscopy: posterior wall extravesical mass
  • Bilateral stents
  • Pfannenstiel, partial cystectomy, Boari flap

• Pathology: endometriosis
Case 1

Case 1
Case 1

- 1 week post-op: infected hematoma (primarily subcutaneous)
- 5 months post-op: Pain free on dienogest (progestin); Liver lesions stable; Discharged
Case 2

- 33 year old G1P1, healthy
- Dysmenorrhea, deep dyspareunia, dyschezia
- New right flank pain
- Exam: vaginal nodule (35mm)
- Ultrasound: left endometrioma on ovary; moderate right hydronephrosis
- Cystoscopy: extrinsic compression of bladder
- Labs: Creatinine 115

Case 2

- OR
  - MIS left ovarian cystectomy
  - Cystoscopy: mass effect
  - Bilateral stents
  - MIS right ureterolysis (released ureter from vaginal nodule) and omental wrap
  - Residual disease

- Pathology: endometriosis
Case 2

- 12 months post-op: pain with breakthrough bleeding on OCP, mild right hydronephrosis, renal scan showed moderate decreased functioning parenchyma right kidney but no obstruction, Creatinine 109

→ patient completed childbearing, requesting hysterectomy

Case 2

- OR:
  - Total laparoscopic hysterectomy, R. oophorectomy, complete excision of endometriosis
  - Ureteroscopy: slight narrowing distal right ureter but adequate calibre
  - Bilateral stents
  - MIS right ureterolysis
Case 2
Case 2

Clip:
https://drive.google.com/file/d/0B540d0Luv1tBUmxNU3ZCMU0zNH/view

Case 2
Case 2

• 3 months post-op: No pain (no hormones), small granulation tissue at vaginal vault, right hydronephrosis “largely resolved”, renal scan unchanged, Creatinine 128

→ Chronic renal insufficiency, follow renal function, refer to nephrology if decreasing GFR

Endometriosis specialists

• Centre for Pelvic Pain and Endometriosis (BCWH/VGH/UBC)
  • Allaire
  • Williams
  • Bedaiwy
  • Yong

• VGH/UBC:
  • Mehra

Womenspelvicpainendo.com