A Growing Problem for Men...BPH

Mark DeGeunther, MD
• Prostatism
• BPH
• BOO
• LUTS
Pathophysiology of BPH and LUTS

Lower Urinary Tract Symptoms (clinical diagnosis)

Bladder Outlet Obstruction (urodynamics diagnosis)

Benign Prostatic Enlargement (anatomical diagnosis)

Microscopic Benign Prostatic Hyperplasia (histologic diagnosis)
Prevalence of BPH by Age
### Top 10 Diagnosed Diseases in 2006 for Men 50 years and older

<table>
<thead>
<tr>
<th>Rank</th>
<th>Disease</th>
<th>1-year prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coronary Artery Disease/Hyperlipidemia</td>
<td>51.3</td>
</tr>
<tr>
<td>2</td>
<td>Hypertension</td>
<td>45.2</td>
</tr>
<tr>
<td>3</td>
<td>Diabetes Mellitus Type 2</td>
<td>17.5</td>
</tr>
<tr>
<td>4</td>
<td>Enlarged Prostate</td>
<td>13.5</td>
</tr>
<tr>
<td>5</td>
<td>Osteoarthritis</td>
<td>13.3</td>
</tr>
<tr>
<td>6</td>
<td>Arrhythmias</td>
<td>8.8</td>
</tr>
<tr>
<td>7</td>
<td>Cataract</td>
<td>8.6</td>
</tr>
<tr>
<td>8</td>
<td>Gastroesophageal reflux disease</td>
<td>8.4</td>
</tr>
<tr>
<td>9</td>
<td>Bursitis</td>
<td>8.0</td>
</tr>
<tr>
<td>10</td>
<td>Prostate Cancer</td>
<td>7.8</td>
</tr>
</tbody>
</table>

**1-year prevalence (%) (n = 963,452 person-years)**

Hormonal Regulation of the Prostate

Hypothalamus → LHRH → Pituitary → LH → Testes

Testosterone → 5α-Reductase → DHT → Prostate (BPH)
Normal vs. Enlarged Prostate

- As the prostate enlarges, pressure can be put on the urethra
- Causes urinary problems
- In general, the size of the prostate does not correlate to severity of symptoms


Normal Prostate Anatomy

Enlarged Prostate (BPH) Anatomy
BPH Disease Progression

Images courtesy Dr. Steven Gange
Not treating enlarged prostate can lead to bladder deterioration
Pathophysiology: Your Bladder Should Be Like
But If Your Bladder Works Too Hard:
Symptoms of BPH

**Obstructive symptoms**
- Hesitancy
- Weak urine stream
- Intermittency
- Dribbling at the end of urination
- Sensation of incomplete emptying of bladder

**Irritative symptoms**
- Nocturia
- Frequency
- Urgency
Distinguishing BPH From Other Causes of LUTS

BPH must be distinguished from:

- Prostate cancer\(^1\)
- Prostatitis\(^2\)
- Urinary tract infection\(^1\)
- Renal insufficiency\(^1\)
- Urethral stricture\(^1\)
- Bladder dysfunction\(^1\)
- Bladder stones\(^1\)
- Overactive bladder\(^3\)
- Bladder Cancer\(^1\)

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Confounding Co-Morbidities

- Parkinson’s Disease
- Dementia
- CVA
- Multiple Sclerosis
- Diabetic Neuropathy
- Spinal Cord Injury
- Advanced age
Complications Associated with BPH

- Urinary retention
- Renal insufficiency
- Urinary tract infection
- Gross hematuria
- Bladder stones
Patient Evaluation

• Medical history
  • Review of patient complaints
  • Patient self-administered questionnaire
    • Use of AUA-SI/IPSS
• Focused physical examination
  • General physical examination, including DRE
  • Neurologic examination
• Laboratory studies
  • Urinalysis
  • PSA assay in appropriate men
  • Urine cystology when appropriate
    • Multiple risk factors
    • Irritative symptoms predominate
### AUA Symptom Index Score

1. Over the past month, how often have you had a sensation of not emptying your bladder completely after you finished urinating?

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Less than 1 time in 5</th>
<th>Less than half the time</th>
<th>About half the time</th>
<th>More than half the time</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2. Over the past month, how often have you had to urinate again less than two hours after you finished urinating?

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Less than 1 time in 5</th>
<th>Less than half the time</th>
<th>About half the time</th>
<th>More than half the time</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3. Over the past month, how often have you found you stopped and started again several times when you urinated?

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Less than 1 time in 5</th>
<th>Less than half the time</th>
<th>About half the time</th>
<th>More than half the time</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

4. Over the past month, how often have you found it difficult to postpone urination?

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Less than 1 time in 5</th>
<th>Less than half the time</th>
<th>About half the time</th>
<th>More than half the time</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

5. Over the past month, how often have you had a weak urinary stream?

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Less than 1 time in 5</th>
<th>Less than half the time</th>
<th>About half the time</th>
<th>More than half the time</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

6. Over the past month, how often have you had to push or strain to begin urination?

<table>
<thead>
<tr>
<th>None</th>
<th>1 time</th>
<th>2 times</th>
<th>3 times</th>
<th>4 times</th>
<th>5 or more times</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

7. Over the past month, how many times did you most typically get up to urinate from the time you went to bed at night until the time you got up in the morning?

<table>
<thead>
<tr>
<th>None</th>
<th>1 time</th>
<th>2 times</th>
<th>3 times</th>
<th>4 times</th>
<th>5 or more times</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total Symptom Score**

The Most Important Question

How much do your urinary symptoms bother you?

• Enough to take daily medicine?
• Enough to consider surgery?
When to Refer to a Urologist

- DRE reveals palpable nodules or irregularities\(^1\)
- PSA level 2.5ng/mL or yearly increase >0.4ng/mL in PSA level over a 3-year period\(^1\)
  - Higher PSA cutoff point (4.0ng/mL) may be justified in older (<70 years)
- Inadequate response to medication/Intolerable side effects
- Refractory LUTS
- Complications\(^2\)
  - Renal failure
  - Bladder or urethral stones
  - UTI
  - Hematuria
  - Urinary retention

The Urologist’s Evaluation

• History/Physical
• UA +/- PSA
• Uroflowmetry
• Post-void residual volume (PVR)
• Cystoscopy
• TRUS measurement of prostate volume
Treatment Options for BPH

• Watchful waiting/Observation
• Pharmacologic therapy
  • Alpha blockers
  • 5AR Inhibitors
  • Herbals (saw palmetto)
• Surgical intervention
  • In office, non-heat based tx (Urolift)
  • In office, heat based tx (Rezum)
  • VLAP (laser TURP)
  • TURP
  • TUVP ("Button" procedure)
  • Robotic subtotal prostatectomy
Pharmacologic Approaches to BPH Treatment

• Phyto therapy (Saw palmetto)
  • Herbal product available OTC
  • Approximately 60% subjective response
  • Main problem is potency of the purchased product since the FDA classifies as a “food product”
  • Takes 2 months to work
  • $6-20 per month

• Alpha-adrenergic blockade
  • Relaxes smooth muscle of prostate/bladder neck
  • Rapidly improves urinary flow and symptoms
  • No long-term issues with medication but about 33% of patients develop significantly decreased effectiveness within several years
Pharmacologic Approaches to BPH Treatment

• 5-alpha reductase inhibitors
  • Reduces prostate size over 5-6 months
  • More gradual symptom improvement
  • Only works in large prostates
  • Lowers serum PSA levels by 40-50%
    • This is often helpful diagnostically in patients with elevated PSA’s and prior negative biopsies. If PSA does not fall 40-50%, the rise is likely NOT due to BPH
“Combination Therapy” Alpha blocker + 5 AR Inhibitor

MTOPS (Medical Therapy of Prostatic Symptoms) Study\(^1\) (finasteride vs doxazosin vs combination vs placebo

Results

- 1 year: doxazosin = combo > finasteride > placebo
- 3 year: combo > doxazosin or finasteride > placebo
- Finasteride and combo decreased risk of invasive tx by 64% and 67%, doxazosin did not
- Finasteride and combo both worked much better with larger prostates (>30g)

Surgical Treatment

- Minimally Invasive
- Heat based therapies
  - Rezum - Steam injection
- Non-heat based therapies
  - Urolift
- Invasive
  - VLAP - Visual Laser Ablation of the Prostate (Laser TURP)
  - TUVP – TransUrethral Vaporization of the Prostate
  - TURP – TransUrethral Resection of the Prostate
  - Robotic subtotal prostatectomy
The Rezūm System consists of a hand held delivery device and generator.
Rezūm II Pivotal Study

IPSS Symptom Improvement Comparable to Surgical Procedures

IPSS Reduction at 1 Year

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Baseline (IPSS ≥19)</th>
<th>Surgical</th>
<th>Minimally Invasive</th>
<th>Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Subjects</td>
<td>12</td>
<td>14</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>Rezūm</td>
<td>12</td>
<td>14</td>
<td>15</td>
<td>NR</td>
</tr>
<tr>
<td>Rezūm</td>
<td>12</td>
<td>14</td>
<td>15</td>
<td>NR</td>
</tr>
<tr>
<td>TURP*</td>
<td>11</td>
<td>9</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Laser*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UroLift**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HE TUMT*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LE TUMT*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alpha Blockers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Rezūm Animation
Rezūm Video
# UroLift® System Treatment

## Advantages

<table>
<thead>
<tr>
<th>Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-office procedure/ASC</td>
</tr>
<tr>
<td>Preserves sexual function</td>
</tr>
<tr>
<td><em>No new and lasting problem with erections or ejaculation</em></td>
</tr>
<tr>
<td>Rapid, durable relief</td>
</tr>
<tr>
<td><em>Typically return to normal within 5-9 days</em></td>
</tr>
<tr>
<td>Typically no catheter (80-85%)</td>
</tr>
</tbody>
</table>

## Disadvantages

<table>
<thead>
<tr>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some discomfort, small amount of blood in urine and increased urgency after procedure (as with any transurethral procedure)</td>
</tr>
</tbody>
</table>

The UroLift delivery device is placed through the urethra to access the enlarged prostate.

UroLift Implants are placed through a needle that comes out of the delivery device to lift the enlarged prostate tissue out of the way.

The UroLift delivery device is removed, leaving a more open urethra.
UroLift® Treatment Images

Before Treatment:
Obstructed Channel

After Treatment:
Open Channel

Images courtesy of Dr. Peter Chin, Wollongong, NSW, Australia

www.urologycentersalabama.com
Post-Treatment Expectations

• Symptom improvement may start within 2 weeks, may continue to improve up to 3 months

• Some irritation such as pain upon urinating, small amount of blood in urine, pelvic discomfort or urgency for some time after the procedure

• Typically return to preoperative activity level within 5-9 days

• Symptom relief may last for 5 years or longer
  • That doesn’t mean the implants only last 5 years
  • 5 years is the maximum length of published clinical follow-up thus far
Rapid Return to Work and Pre-Op Activities: L.O.C.A.L. Study Results

- 86% achieved high quality recovery\(^1\) within 1 month
- Satisfaction (via Patient General Impression Index):
  - 90% reported improvement in their condition

<table>
<thead>
<tr>
<th>Perioperative Assessments</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return to work (days)</td>
<td>2.8</td>
<td>3.7</td>
</tr>
<tr>
<td>Return to preoperative activity* (days)</td>
<td>5.1</td>
<td>5.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Productivity at 1 Month</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Work missed</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Overall work impairment</td>
<td>3%</td>
<td>9%</td>
</tr>
<tr>
<td>Impairment in activity</td>
<td>8%</td>
<td>19%</td>
</tr>
</tbody>
</table>

\(^1\) High quality recovery defined as ≥ 80 on the Quality of Recovery VAS

UroLift® vs TURP: No Difference in Quality of Life

• Despite predicted differences in IPSS and Qmax, improvement in quality of life was not different.
• Important to evaluate with patients risks vs returns for each treatment option.

<table>
<thead>
<tr>
<th></th>
<th>Change at 1 year</th>
<th>Difference p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PUL</td>
<td>TURP</td>
</tr>
<tr>
<td>IPSS</td>
<td>-11.4</td>
<td>-15.4</td>
</tr>
<tr>
<td>Qmax [mL/sec]</td>
<td>+4.0</td>
<td>+13.7</td>
</tr>
<tr>
<td>QoL</td>
<td>-2.8</td>
<td>-3.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

Sonksen et al. Eur Urol 2015
L.I.F.T. Study Results

Roehrborn et al., 2016

Mean IPSS vs. Months

Roehrborn Urol Clin N Am 2016
Transurethral Resection of the Prostate TURP

• TURP = The “Gold Standard”
• Requires general or spinal anesthesia
• Must be off anti-coag/anti-platelet meds
• 1-2 night hospitalization with catheter
• 90% overall success
• Tissue is available for pathologic examination
Transurethral Vaporization of the Prostate
TUVP

- Requires general or spinal anesthesia
- Must be off anti-coag/anti-platelet meds
- Similar to a TURP in rapidity of effectiveness and overall success (>90%)
- Less bleeding, quicker recovery, less pain, typically overnight stay
- Tissue not available for pathologic examination
Resectoscopes

TURP Loop

TUVP Button
<table>
<thead>
<tr>
<th>Description</th>
<th>TURP</th>
<th>TUVP</th>
<th>VLAP</th>
<th>Rezum</th>
<th>UroLift</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuts prostate tissue out through scope in urethra</td>
<td>Melts prostate tissue away through scope in urethra using electrical energy</td>
<td>Melts prostate tissue away through scope in urethra using laser energy</td>
<td>Steam injected into prostate via a scope in urethra to kill cells that will be reabsorbed by the body</td>
<td>Sutures placed via a scope through prostate to hold the urethra open</td>
<td></td>
</tr>
<tr>
<td>Anesthesia needed</td>
<td>General or spinal</td>
<td>General or spinal</td>
<td>General or spinal</td>
<td>Sedation and nerve block</td>
<td>Sedation and nerve block</td>
</tr>
<tr>
<td>Location performed</td>
<td>Hospital Operating Room</td>
<td>Hospital Operating Room</td>
<td>Hospital Operating Room</td>
<td>Office</td>
<td>Office or OR</td>
</tr>
<tr>
<td>Hospital stay</td>
<td>1-2 nights</td>
<td>0-1 night</td>
<td>0-1 night</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Catheter needed</td>
<td>1-2 days</td>
<td>1 day</td>
<td>1 day</td>
<td>3 days</td>
<td>None usually</td>
</tr>
<tr>
<td>Improvement seen when</td>
<td>Better flow often immediate, relief in other symptoms (frequency, urgency, nighttime voiding) 6-12 weeks</td>
<td>Better flow often immediate, relief in other symptoms (frequency, urgency, nighttime voiding) 6-12 weeks</td>
<td>Better flow often immediate, relief in other symptoms (frequency, urgency, nighttime voiding) 6-12 weeks</td>
<td>No real improvement for 6-12 weeks</td>
<td>Better flow often immediate, relief in other symptoms (frequency, urgency, nighttime voiding) 2-3 weeks</td>
</tr>
<tr>
<td>Retrograde Ejaculation</td>
<td>75%</td>
<td>75%</td>
<td>75%</td>
<td>10%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Stricture/scarring risk</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Overall Success</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Years in clinical use</td>
<td>1950’s</td>
<td>2013</td>
<td>2008</td>
<td>2014</td>
<td>2013</td>
</tr>
<tr>
<td>Also known as</td>
<td>Roto-rooter</td>
<td>Plasma Button by Olympus</td>
<td>Greenlight or Holmium laser</td>
<td>Water vapor or steam therapy</td>
<td>Prostatic Urethral Lift (PUL)</td>
</tr>
<tr>
<td>Length of procedure</td>
<td>45-60 min</td>
<td>45-60 min</td>
<td>45-60 min</td>
<td>10 min</td>
<td>10 min</td>
</tr>
<tr>
<td>Return to work</td>
<td>3-5 days</td>
<td>2-3 days</td>
<td>2-3 days</td>
<td>1 day (if can work with catheter)</td>
<td>1 day</td>
</tr>
<tr>
<td>Activity restrictions</td>
<td>No lifting over 25 lbs for 2 weeks, no bouncing like horseback riding for 2 weeks</td>
<td>No lifting over 25 lbs for 2 weeks, no bouncing like horseback riding for 2 weeks</td>
<td>No lifting over 25 lbs for 2 weeks, no bouncing like horseback riding for 2 weeks</td>
<td>None except as limited by catheter</td>
<td>None</td>
</tr>
<tr>
<td>Google Search terms</td>
<td>TURP</td>
<td>Button procedure by Olympus</td>
<td>Laser TURP or VLAP</td>
<td>Rezum</td>
<td>Urolift</td>
</tr>
</tbody>
</table>
THANK YOU