PROSTATIC EMBOLIZATION FOR BENIGN HYPERPLASIA – INITIAL CLINICAL RESULTS

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NO DISCLOSURE TO DECLARE
PAE - SUMMARY

- Clinical Presentation of BPH
- BPH Treatments
- Work up of BPH patient
- Patients selection for PAE
- Different steps of PAE
- Post-PAE follow-up control
- Results of 240 treated patients
Clinical Presentation

Lower Urinary Tract Symptoms (LUTS)

- Polaquiuria
- Nocturia
- Stream
  - Decreased
  - Hesitant
  - Interrupted
- Urinary Urgency
- Dribbling

Sexual dysfunction

Asymptomatic
BPH TREATMENTS

- Medical therapy – 1st line option
- Minimally invasive surgical therapy (MIST)
- Prostatectomy:
  - Transurethral resection (TURP) < 60-80 cc
  - Open surgery > 60-80 cc
MEDICAL THERAPY

α – Blockers
- Tansulosin
- Alfuzosin
- Dexazosin

5 α – Reductase inhibitors
- Finasteride
- Dutasteride
MINIMALLY INVASIVE SURGICAL THERAPY (MIST)

- TUMT (transurethral microwave thermotherapy)
- TUNA (transurethral needle ablation)
- ILA (international laser ablation)
MINIMALLY INVASIVE SURGICAL THERAPY (MIST)

- Lower symptomatic improvement
  - Greater risk of
    - Failure
    - repeated treatment

- Poorer lasting results
PROSTATECTOMY

- TURP – Transurethral Resection of the prostate <60-80cc
- Open surgery > 80-100cc
TURP – TRANSURETHRAL RESECTION OF THE PROSTATE

 действие

Golden standard treatment

Open surgery > 80-100cc

Complications

- Urinary tract infection
- Post operatory pain
- Blood loss
- Urinary incontinence
- Urinary Retention
- Sexual dysfunction
- Urethral stricture
- Transurethral resection syndrome
- Clinical failures – 25 -30%
NEED OF INNOVATIVE TECHNOLOGY TO TREAT BPH

To improve outcomes

Minimize:

- Patient discomfort
- Morbidity
PAE - RATIONALE

- Case by DeMerritt and experimental cases (dogs, pigs) – prostate reduction, no sexual dysfunction
- Similarity to UFE after having treated + 800 cases, with excellent results
- PAE minimally invasive procedure
- High complications after TURP and open surgery
WAITING TIME - Filling Questionnaires

- IPSS (international prostate symptoms score): 0 – 35;
- QoL – (quality of life): 0 – 6;
- IIEF (international index of erectile function): 1 – 25
BPH PATIENT WORK UP

- Clinical History: smoking, diabetes, vascular
- Physical examination DRE
- IPSS, 0 – 35; QoL – 0 – 6; IIEF 1-25
- Prostate volume – TRUS, MR
- PSA – (Prostate specific antigen)
- Uroflowmetry
  - Qmax (Peak urinary flow) <12 mL/s
  - PVR (post-void residual volume) >50cc
## International Prostate Symptom Score

<table>
<thead>
<tr>
<th>Symptom</th>
<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>
<th>Your Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. INCOMPLETE EMPTYING</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Over the past month, how often have you had a sensation of not emptying your bladder completely after you finished urinating?</td>
<td></td>
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<tr>
<td>2. FREQUENCY</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</tr>
<tr>
<td>Over the past month, how often have you had to urinate again less than 2 hours after you finished urinating?</td>
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<tr>
<td>3. INTERMITTENCY</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Over the past month, how often have you found you stopped and started several times when you urinated?</td>
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<tr>
<td>4. URGENCY</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Over the past month, how often have you found it difficult to postpone urination?</td>
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<tr>
<td>5. WEAK STREAM</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Over the past month, how often have you had a weak urinary stream?</td>
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<td></td>
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<tr>
<td>6. STRAINING</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Over the past month, how often have you had to push or strain to begin urination?</td>
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<td></td>
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<tr>
<td>7. NOCTURIA</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>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?</td>
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</tbody>
</table>

Which of the above do you regard as most troublesome? (1 – 7) __________

**TOTAL PROSTATE SYMPTOM SCORE**

<table>
<thead>
<tr>
<th>Delighted</th>
<th>Pleased</th>
<th>Mostly Satisfied</th>
<th>Mixed – Satisfied and Dissatisfied</th>
<th>Mostly Dissatisfied</th>
<th>Unhappy</th>
<th>Terrible</th>
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</table>

**QUALITY OF LIFE DUE TO URINARY SYMPTOMS**

If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that? (pick one)

<table>
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</tr>
</tbody>
</table>
Table 2  The IIEF-5 questionnaire

<table>
<thead>
<tr>
<th>Item</th>
<th>Very low</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Very high</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  How do you rate your confidence that you could get and keep an erection?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2  When you had erections with sexual stimulation, how often were your erections hard enough for penetration?</td>
<td>Almost never/never (much less than half the time)</td>
<td>A few times (about half the time)</td>
<td>Sometimes (about half the time)</td>
<td>Most times (much more than half the time)</td>
<td>Almost always/always</td>
</tr>
<tr>
<td>3  During sexual intercourse, how often were you able to maintain your erection after you had penetrated (entered) your partner?</td>
<td>Almost never/never (much less than half the time)</td>
<td>A few times (about half the time)</td>
<td>Sometimes (about half the time)</td>
<td>Most times (much more than half the time)</td>
<td>Almost always/always</td>
</tr>
<tr>
<td>4  During sexual intercourse, how difficult was it to maintain your erection to completion of intercourse?</td>
<td>Extremely difficult</td>
<td>Very difficult</td>
<td>Difficult</td>
<td>Slightly difficult</td>
<td>Not difficult</td>
</tr>
<tr>
<td>5  When you attempted sexual intercourse, how often was it satisfactory for you?</td>
<td>Almost never/never (much less than half the time)</td>
<td>A few times (about half the time)</td>
<td>Sometimes (about half the time)</td>
<td>Most times (much more than half the time)</td>
<td>Almost always/always</td>
</tr>
</tbody>
</table>

*The IIEF-5 score is the sum of the ordinal responses to the five items; thus, the score can range from 5 to 25.*
INCLUSION CRITERIA

- Age superior to 50 years
- IPSS > 18 and/or QoL ≥ 4 or acute urinary retention
- Qmax (peak urinary flow rate) < 12mL/sec
- Prostate volume > 40cc
- Failure of medical treatment (6 months)
- Sexual dysfunction or accepting its risk
PATIENT CANDIDATE
PRE-PROCEDURE CT ANGIOGRAPHY

- Iliac and prostate arteries atherosclerotic changes
- Origin and direction of prostatic arteries
- Nº of pedicles
- Anastomoses
CT - ANGIOGRAPHY

Information to give to patients

- Impossible
- Very difficult
- Difficult
- Possible
- Easy
CT ANGIOGRAPHY

- Some limitations
- Not completely reliable
- Advanced atherosclerosis not predictable
- Diabetics
EXCLUSION CRITERIA

- Malignancy – 28 pts
- Advanced atherosclerosis (iliac, prostatic arteries)
  - Angio CT - 15 pts
- Detrusor failure – 12 pts
- Large bladder diverticulum or stone – 4 pts
- Neurogenic bladder – 2 pts
- Stenosis of the urethra – 1 pt
PATIENTS SELECTION

- Inclusion Criteria
- No contraindication
METHODS OF PAE

- Local anesthesia
- Femoral approach uni or bilateral
- 5 F RUC, C2 + (microcatheter)
- PVA – 100 µm, 200 µm
- Bilateral PAE
- End point: Slow flow or near stasis + prostate bed opacification
SCHEMATIC DRAWING OF PAE

Bladder

Catheter

Prostatic Arteries

Femoral Artery

Prostate

Urethra
DIFFERENT STEPS OF PAE

- Angiography anterior division of IIA (Ipsilateral oblique -35°, caudal-craneal-10°)
- Selective catheterization of prostatic artery
- Embolization
- Post embolization control
TECHNICAL SUCCESS

Technical success - embolization of at least one prostatic artery – 234/240 (97.5%)

- Bilateral Embolization PAE – 211/234 (90.2%)
  - Complete embolization – 193/211 pts (91.5%)
  - Incomplete embolization – 18/211 pts (8.5%)

- Unilateral PAE – 23/234 (9.8%)

Technical failures - non embolization of any of the prostatic arteries – 6/240 (2.5%)

- Outpatient (4-8 h) – 218/240 (90.8%)
CONTROL F.U

- Clinical – IPSS, QoL, IIEF
- Urodynamic – Qmax, PVR
- Prostate volume, PSA

1, 3, 6 and every 6 months after PAE
CLINICAL IMPROVEMENT

- IPSS ↑ 25% of total score and < 18
- QoL ↓ 1 of total score and or ≤ 3
- Qmax ↑ ≥ 2.5 mL/s

CLINICAL IMPROVEMENT

1 month – 88.4%

3 months – 84.6%

6 months – 78.4%

12 months – 72.1%

24 months – 70.2%

30 months – 69.8%
Arterial Embolization – Results
REDUÇÃO 61.7%
CLINICAL FAILURES

- Reduction of IPSS <25% and ≥ 18
- QoL ≥ 4 and or reduction < 1
- Qmax ↑<2.5 mL/s
- Additional treatment required
HOW TO GET A GOOD SUCCESSFUL PAE

- Clinical indication
- Respect inclusion and exclusion criteria
- Medical therapy for at least 6 months
- Plan PAE before entering Angio Suite
- Select only suitable anatomy cases
ARE THE RESULTS OF PAE PREDICTABLE?

- Patients same prostate volume $\downarrow \neq$ outcome
- Prostate volume $\downarrow$ - no improvement
- Prostate volume $\uparrow$ – improvement
- Bilateral and complete PAE – failure

$\downarrow$

Patients informed of unpredictable results even with good embolization
PAE is a safe and minimally invasive outpatient procedure performed under local anesthesia.

Still experimental.

Critical Selection, good training.

Good short and medium term symptoms control.

Low morbidity: no sexual dysfunction, no urinary incontinence, no pain.

Future procedure for BPH > 100 cc.
REFERENCES


