Transurethral Resection of Ejaculatory Duct Obstruction: Monopolar, Bipolar or Holmium Laser?

Selahittin Çayan, MD, FECSM
Professor of Urology

University of Mersin School of Medicine,
Department of Urology, Mersin, Turkey
Ejaculatory Duct Obstruction

- Incidence: 1-5%
- 1942 R. Gutierrez
- 1973 S. Farley and R. Barnes

Importance of EDO in men:
- Painful ejaculation, decreased force
- Hematospermia
- Perineal and testicular pain
- Infertility
  - Low ejaculate volume
  - Azoospermia
  - Oligospermia/idiopathic infertility
Classification of Ejaculatory Duct Obstruction (EDO)

- **Anatomy (Smooth muscle, columnar epithelium)**
  - Proximal (Length: 10-15 mm, Diameter: 1.7±0.3 mm)
  - Middle part (Length: 5-8 mm, Diameter: 0.6±0.1 mm)
  - Distal (Length: 2-5 mm, Diameter: 0.3±0.1 mm)

- **Congenital**
  - Cysts (Midline/lateral)
    - Determinations predicts success for treatment
  - Atresia & stenosis

- **Acquired (Secondary obstruction)**
  - Stone, calcification
  - Infection, inflammation
Classification of midline cysts causing obstruction

- Mullerian cyst
- Utricle cyst
- Ejaculatory duct cyst
Algorithm for Diagnosis and Treatment of EDO

Obstructive infertility (Palpable vas deferens, testicular volume >15 ml)

↓

Ejaculate volume

Normal

↓

FSH

(Partial EDO)

Retragrade ejaculation

↓

Negative

Positive

↓

TRUS

↓

Negative

MRI

Aspiration, chromotubation, vesiculography, SV EF, manometry

TUR ED

Proximal obst?, exploration?

Bladder irrigation

/ART

Diagnostic Methods

- Transrectal ultrasound (TRUS)
- Non-invasive, cheap, easy procedure
- Findings for obstruction
  - Dilated SV (A-P > 1.5 cm)
  - Dilated vasa deferentia (>6mm)
  - Dilated ejaculatory duct (>2mm)
  - Stone/calcification
- TRUS is not gold standard for diagnosis of EDO

Chromotubulation
Diagnostic Methods

- **MRI**
  - Advantages:
    - Multiplan imaging
    - High resolution
    - Non-invasive
  - Dysadvantages:
    - Expensive
    - Not easy procedure
  - Complicated cases?

**Engin G, Kadioğlu A, Orhan İ Acta Radiol 2000; 41:288–295**

- **Vasodynamics**
- **SV Scintigraphy**

**Orhan İ et al, Urology, 2008**
Surgical Treatment of Ejaculatory Duct Obstruction

- Transurethral resection of Ejaculatory Duct (TUR-ED)
  - Monopolar
  - Bipolar
  - Laser incision (Neodymium, holmium)

- Alternative treatment methods to TUR-ED
  - Transutricular seminal vesiculoscopy
  - TRUS guided re-canalization and balloon dilation
  - Laparoscopic excision (External prostatic ED cyst)
Case presentation

- 39 years old man, primary infertility
  - Testicular pain, painful ejaculation

- Physical examination:
  - Normal (No varicocele)
  - Testis volume: 18 ml / 18 ml normal consistency

- Semen analysis:
  - Ejaculate volume: 0.4 ml,
  - Azoospermia (pellet -)

- Hormonal evaluation:
  - FSH and total testosterone: N

- Transrectal ultrasound:
  - Midline cyst (1,1 cm)
TUR-ED

- Transurethral midline resection of verumontanum
- Resection should not be extended to proximally or distally
- Depth of the resection should be well defined
- Eflux of the duct should be seen
- Avoid from cauterization
- Urethral catheterization for 24-48 hours
Cyst wall after TUR-ED
Primary TUR-ED
Secondary TUR-ED
Results of TUR-ED

- Improvement in hematospermia
  - Relief in symptoms (50-95%)
- Improvement in sperm parameters
  - Partial obstruction: 94%
  - Complete obstruction: 59%
- Complications: 0-20%
  - Hematuria, infection (Epididymoorchitis)
  - Retrograde ejaculation, reflux, fistula, ED, stenosis
- Positive effect of TURED on ART
  - To obviate the need for ART (20-40%)
  - To downstage the level of ART
    - From IUI to spontaneous pregnancy (13%)
    - From IVF/ICSI to IUI (50%)

Bipolar Technology

- Different systems
- Different techniques
  - Vapor, chip removal, enucleation
- Same: Work with saline
Why Bipolar Technology?: Theory

- Increased visibility
- Avoiding complications of monopolar TURED
  - Functioning in normal saline instead of in conventional nonconductive irrigation fluid, dilutional hyponatremia risk should be eliminated
  - Haemostatic capacity reported to be superior in ex vivo studies:
    - Deeper coagulation
    - Simultaneous cut and seal effect
- Early catheter removal
- Shorter hospitalization
Laser techniques

- Holmium laser incision
  - Wavelength 2140 nm, Solid-state laser
  - Absorbed by water, normal saline as irrigating fluid

- 532 nm (Greenlight) vaporisation

- Diode laser vaporisation

- Thulium : yttrium–aluminium–garnet Laser (Tm:YAG)
Why Laser Technology?

- Increased visibility
- Avoiding complications of monopolar TURED
  - Functioning in normal saline instead of in conventional nonconductive irrigation fluid
  - Better hemostasis
    - Can be performed under anti-coagulants
- Early catheter removal
- Shorter hospitalization

Disadvantages:
- Needs experience and endoscopic skills
- Most common post-operative complication - dysuria
Transurethral incision of the Ejaculatory Duct with Holmium laser

- 11 patients
  - Azoospermia and low ejaculate volume
  - Midline cyst

- Unroofing of midline prostate cyst (Laser)
- No severe complication
  - Hematospermia (1 case)

Jiang et al, Asian J Androl, 2014
32 year old man

- Azoospermia and low ejaculate volume
- Midline cyst

- Unroofing of midline prostate cyst (Laser)
- Complete resection of the cyst wall (mono-polar)
Surgical Treatment of Ejaculatory Duct Obstruction

- Transurethral resection of Ejaculatory Duct (TUR-ED)
  - Monopolar
  - Bipolar
  - Laser (Neodymium, holmium)
- Alternative treatment methods to TUR-ED
  - Transutricular seminal vesiculoscopy
  - TRUS guided re-canalization and balloon dilation
  - Laparoscopic excision (External prostatic ED cyst)
TRUS guided balloon dilation
Laparoscopic excision of extraprostatic ejaculatory duct cyst

- Three cases
- Laparoscopic excision of extraprostatic ED cyst

- Improvement in semen parameters: 2/3

Wang et al, Journal Compilation, 2007
Conclusions

- Transurethral resection of ejaculatory duct is a well accepted treatment of ejaculatory duct pathologies.
- It is safe, easy to perform and effective treatment modality.
- Embryological remnants are effective to predict prognosis.
- All methods are highly effective to improve symptoms and to correct obstruction.
- Laser incision/un-roofing may decrease complication rates.