Transurethral Laser Sphincterotomy: International Consensus (TURS)
(Surgery to Decrease Outlet Resistance)

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Learning Objectives

At the conclusion of this activity, the participant will be able to:

• A. Surgical management of Neurogenic bladder in Patients who cannot self catheterize and drain bladder.

• B. Management of spinal injured patients with autonomic dysreflexia particularly if it is not amenable to adequate control with medical management.

• C. Role of transurethral sphinterotomy to prevent and manage complications such as vesico-ureteral reflux and stone disease.
Indications of TURS:

The primary indication for TURS is in those individuals who have elevated residual urine volumes in the presence of good but involuntary detrusor contraction and who have failed conservative management.

Following an adequate TURS, an improvement in bladder emptying and stabilization of the upper urinary tract and amelioration of autonomic dysreflexia can be reasonably expected in 70-90% patients.

Wein et al; Urology 1976,8,432
Perkash; J. Urol., 124, 249, 1980
Goals of Sphincterotomy (TURS)

- Stabilize and or improved renal function
- Lower detrusor leak point pressure
- Prevent urosepsis/stone disease
- Stabilize or eliminate V.U. reflux
- Eliminate indwelling catheter
- Ameliorate - prevent Autonomic Dysreflexia
Indications; TURS:

1. Repeated Autonomic Dysreflexia typically in Tetraplegics with poor hand function.
2. Repeated UTI. (symptomatic)
3. Difficult catheterization due to stricture, or a false passage.
4. Secondary bladder neck obstruction: TUIP. 
   Bladder Neck- **Ledge**,median lobe. 
   (difficult catheterization)
Bladder Neck Ledge. L-ledge, B-Bladder, U-Urethra. N-narrow bladder Neck
Bladder Neck Ledge:

• 162/339 (47%) SCI had ledge and only 2/110 (1.8%) non SCI showed posterior bladder neck ledge. @ 28% of SCI patients had a significant ledge (>0.5cm) and they were on Intermittent Catheterization and were associated with Detrusor sphincter dyssnergia. (p value <0.0005, Mann-Whitney test)

Indications: TURS (Cont’d)

5. Inadequate bladder drainage resulting in
   - upper tract changes
   - vesico-ureteral reflux/stone disease.
   - renal function deterioration

6. Prostate-ejaculatory reflux
   (Repeated epididymo-orchitis)
TURS: Surgical Techniques:

1. Knife electrode (Diathermy)
   12 O’clock incision
   - Colling's Knife
   - Perkash ACMI Knife
Diathermy TURS, Problems:
- Op & post Op secondary bleed
- clot retention
- prolonged catheterization
- impotence
- stricture urethra (bulbous)
- reoperation 30-60%

Majority failures of TURS are due to inadequate surgery.

Additional bladder neck incision in 14% patients following 12 O’clock TURS.

Technique: Laser Physics:

- Free beam Nd:YAG: Produces coagulative necrosis, for TURS need to start in a contact mode for incision and vaporization.
- Contact laser Nd:YAG; SLT..or even HO:YAG in a contact mode ....for vaporization
Contact Laser: Chisel Crystal (SLT)

* 20-25 watts

* For adequate cutting 35-40 watts

Perkash, J. Urol. 152, 2020, 1994

Holmium:YAG Laser (HO:YAG):
(Widely Used)

- Pulsed Mode wave length 2100 nm
- High water absorption
- Tissue effects within 3 mm of fiber
- Touch the tissue to cut…
- Withdraw 1-2 mm for controlled homeostasis.
- Light absorption depth - less than 0.5 mm.
HO:YAG Laser (15 W – 60 Watts)

- Quarts laser fibers
- 220, 325, 550 and 1000 um fibers
- (Vaporization bubble at the fiber tip increases with fiber diameter)
HO:YAG Laser:

- Energy 0.2 to 4.0 J per pulse (pulse duration up to 500 microsecond)
- Frequency 5 to 40 Hz (pulses per second)

For TURS max. 1.2 J x 10 Hz (12 W) was used in an almost contact mode
External Urethral Sphincter
External Urethral Sphincter
TURS Laser Incision
Failed TURS: Bladder Neck not incised: Severe Aut. Dysreflexia
HO:YAG Vaporization... Scar Tissue
Post TURS with additional incisions.
Post Diathermy Stricture: Laser Incision
Fig. 2A: VCUG before surgery. (Patient Z)
Fig. 2B: 7 years after vaporization. (Patient Z)
ACMI-‘Perkash’ Knife for TURS and TUIP.
TUIP-incisions… Bladder Neck Fibers
TUIP Incisions…3 and 9 O'clock
1. Bladder Neck Stenosis....
2. Circumferential Vaporization of Bladder Neck
Contact Laser TURS = 99 Patients
   (HO = 9 Patients)

TUIP & TURS = 21 Patients
   \[ \frac{120}{120} \]
Laser Failures: 14 % Patients (9 Year follow up)

* Areflexic Bladder 4 Patients
* Stricture Urethra 5 (Previous diathermy TURS)
* Post Baclofan pump 1
* Severe Spasticity 3
* Inadequate TURS 4 (learning phase)

= 17 Patients

(12 relasered within 1st year)

* Relasered Patients: Minimal Bleeding (Less than 25 ml).
****Avoid TURP with TURS

(leakage of urine around catheter-indwelling and on straining during ICP)
Successful Outcome TURS:

- Little or no bleed
- Catheter 24 hours
- Leak point pressure below 40 cm H₂O
- Repeat surgery <10%
- Significant amelioration of autonomic dysreflexia.
46 patients. Significant drop in maximum systolic BP. (p value 0<.00001)
46 patients. Significant drop in maximum diastolic BP. (P value 0<.0001)
Conclusions:
*Transurethral resection of the external urinary sphincter (TURS) is a reasonable option to adequately drain the bladder to prevent urologic complications in the spinal cord injury or myelopathic disorders in the male patients.

(Perkash, et al, Consensus Incontinence 2002 W.H.O.)
The procedure helps to decrease urinary outflow resistance due to detrusor-sphincter dyssynergia, and ameliorates autonomic dysreflexia.

* Perkash, J.Urol. 2007, 177, 1026-129.

It reduces the intravesical voiding pressure mediated by bladder contractions against a dyssnergic contracted external urethral sphincter, and prevents upper tract complications; V-U reflux, infections and stone disease.

**This improves quality of life, particularly of Quadriplegic Patients who cannot self-catheterize and also suffer from DSD.
Difficult Ext. Condom Drainage:

(Short Phallus: Failure 10-15%)

* Consider Penile Implant

(Perkash, Paraplegia, 5, 327, 1992)
TURS: other Options.: (Failed Int. Cath.

- Urethral stents
- Suprapubic catheter
- Diversions, neo bladder, ileostomy,
- Bladder stimulation
Fig. 7. A, appearance of hyperplastic urethral covering of stent at 3 months. B, endoscopic view of same stent 2 years after implantation.
Sacral Anterior Root Stimulation (SARS) combined with Sacral Posterior Root Rhizotomy - Sacral Deafferentation (SDAF)

SACRAL DEAFFERENTATION (POST. SACRAL ROOT RHIZOTOMY) & IMPL. OF AN ANTERIOR ROOT STIMULATOR (BRINDLEY)

TRANSMITTER

RECEIVER

STIM. BOX

SUBCUT. IMPL. (THORACIC/ABD. WALL/THIGH)

ELECTRODE-CABLES

MOUNTS

GANGLION SPINALE

S 2, 3, 4/5

N. PELV.

N. PUD.