

Endourology courses

Curriculum Guidelines of Endourology for Postgraduates

Rationale:

The trend in medicine has been toward nonoperative or "minimally invasive" surgical procedures. This trend has been apparent in urology. Often minimally invasive endoscopic procedures replace surgical proceded. As part of this trend toward non-operative therapy, there has been a steady increase in the number of endoscopic procedures performed within the urinary tract both for diagnostic and therapeutic purposes.

Endoscopic procedures have many advantages it has been associated with less minor complications, shorter hospital stay, short convalescence when compared to open surgery. Also, the use of endoscopic procedure in urology could have implications in reducing the financial burden on health care systems and at the same time will improve the well-being of patients. Before embarking on endourologic procedure, each urologist should develop a safe technique firstly for the basic skills followed by advanced skills..

Goal:

There is a core group of knowledge common to all endourologic procedures concerning selection, and care of endoscopic sets. Also before selection of ideal candidate for endoscopic procedure is mandatory before mastering basic skills .

Upon completion of this course, the participant will be able to know the basics of diagnostic and therapeutic procedures in the field of endourology.

Objectives:

This course will focus on the basic principles and skills of both diagnostic and therapeutic procedures in endourology. The participant will be able to:-

- 1- Select the endoscopic instruments needed for each endourologic procedures.*
- 2- Apply the basic principles of sterilization and care of endourologic sets.*
- 3- Recognize the indications and potential complications of every endourologic procedure.*
- 4- Recognize special considerations in auxiliary instruments guide wire and type of irrigant fluid used.*

- 5- Learn some procedure on simulators, Vido-tape and CD.
- 6- Ultimately learn these procedures in the operating room under the direction of skilled end urologists.

History and evolution

- Endourologic instrument have been advanced to deal with urinary system for both diagnostic and therapeutic purposes .
- The Greatest single advance in minimally invasive surgery was the development of the endoscope.
- The first endoscope was that developed by Phillipe Bozzini of Frankfurt between 1803-1808. It is consisted of silver tube illuminated by light from candle reflected by mirror.
- 1853, Desormeaux improved illumination by replacing candle with a lamp powered by turpentine and achohol with limited field of view.
- In 1879 Nitze-Lieter endoscope was the first endscope to resemble a modern rigid cystoscope with distal illumination by platinum wire, lens system and an instrument channel.
- Numerous modifications occurred after Edison bulb invention in 1891 including prism to correct image inversion and to achieve angled field.
- In 1951 professor Harold Hopkins introduced the first glass fiber since then the fiberoptics has progressed rapidly, where the light was transmitted to the tip of instrument.
- In 1956 Hopkins transformed the optics on rigid telescopes by introducing a rod lens system.

RIGID ENDOSCOPES:

- 1- Rod lens system.
- 2- Fiberoptic bundle.
- 3- Irrigant channel.

Rod lens system:

This is the optical system of telescope, and composed of:

- Objective lens.
- Series of rod lenses to relay image is eyepiece.
- Eye piece lens produces magnified virtual image non inverted.
- Most telescopes contain reflecting prisms to deviate the optical axis to desired direction of view enter 0, 30, 70 and 120.

Basic endourologic course for Postgraduates :

- URETHRO-CYSTOSCOPY.
- VISUAL INTERNAL URETHROTOMY
- LITHLOPAXY
- TRANS URETHRAL RESECTION
- URETEROSCOPY
- NEPHROSCOPY

Cleaning and sterilization of instruments

- Tap -water.
- Soap
- Brush.
- Gluteraldehyde 2% (Cidex) for 20 minutes
- Antimony compound (Micro 10) for 15 minutes
- Draying by cotton piece and compressed dry air.

1- URETHRO-CYSTOCOPY

* Instruments:

- 1- Cystescope sheath.
- 2- Bridge.
- 3- Telescope (0-30-70).
- 4- Light source and light cable

* Indications:

- 1- Cystitis.
- 2- Haematuria.
- 3- Echognic bladder growth in U/S.
- 4- Filling defect in cystogram

- 5- Difficulty.
- 6- Follow up after TURT.
- 7- Preliminary step in ureteroscopy.
- 8- Insertion of ureteric catheter or JJ stent..
- 9- Removal of JJ stent.
- 10- Evacuation of clot retention.

Steps of urethrocytoscopy

1. *position: lithotomy*
2. *sterilization*
3. *towling*
4. *introduction of cystoscope under vision till the bladder*
5. *inspection of bladder neck, ureteric orifices, bladder lesion, remaining bladder mucosa.*

2- VISUAL INTERNAL URETHROTOMY (VIU)

** Instruments:*

- *Urethrotome sheath.*
- *Telescope 0.*
- *Working element of urethrotomy.*
- *Cold, Knife.*

** Indications:*

- *In treatment of stricture urethra which has the following criteria:*
- *Short.*
- *Mucosal.*
- *Passable.*
- *On alignment.*
- *Not complicated.*

Steps of visual internal urethrotomy

1. *position: lithotomy*
2. *sterilization*

3. *towling*
4. *introduction of cystoscope under vision till the strictuer area*
5. *passing a guide wire till the bladder*
6. *cut through the stricture along the guide wire*
7. *insertion of urethral catheter*

* Complications:

- 1- *Failure.*
- 2- *Bleeding.*
- 3- *False passage (extravasations).*
- 4- *Infection.*
- 5- *Recurrence.*

3- *LITHOLAPAXY*

* Instruments:

- *Visual lithotrite.*
- *Telescope 70.*
- *Ellik's evacuator.*

* Indications:

- *Stone bladder in adult without contraindications.*

* Contraindications:

a. *Absolute:*

- 1- *Children.*
- 2- *Contracted bladder.*
- 3- *Bilateral VUR.*

b. *Relative*

- 1- *Hard stone.*
- 2- *Soft stone.*
- 3- *Large sized > 2.5 cm.*
- 4- *stricture urethra.*
- 5- *BPH.*
- 6- *BNO.*
- 7- *Stone in diverticulum.*

* Litholapaxy procedure:

- *General or regional anesthesia.*

- *Lithotomy position.*
- *Urethrocystoscopy and leave the bladder semifilled.*
- *Introduction of lithotrite with 70 telescope and impact the stone.*
- *Under vision open the jaws of lithotrte, catchand crush the stone to small fragment.*
- *Evacuate the fragment by ellik's evacuator.*
- *Cystoscopy to ensure mucosal integrity.*
- *Fixation of foley's catheler for 24 hours.*

** Complications:*

- 1- *Failure of introduction.*
- 2- *Bleeding.*
- 3- *False passage.*
- 4- *Failure of disintegration.*
- 5- *Bladder injury.*
- 6- *Failure of extraction.*
- 7- *UTI.*

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4- Transurethral resection

** Instruments:*

- 1- *Resectoscop sheath.*
- 2- *Working element of resectoscope.*
- 3- *Telescope 30 degree.*
- 4- *Loop and high frequency cable.*
- 5- *Under water electro-cautary system.*
- 6- *Ellik's evacuator.*
- 7- *Three way's Foley's catheter.*

** Indications:*

- 1- *Transurethral resection of prostate.*
- 2- *Transurethral resection of bladder TCC.*
- 3- *TUR biopsy.*
- 4- *TUR meatotomy.*
- 5- *TUR ulcer bladder.*
- 6- *TUR granuloma.*

Steps of TURP

1. **position: lithotomy**
2. **sterilization**
3. **towling**
4. **uethroscoscopy**
5. **insertion of resectoscope**
6. **start resection with median lobe then the lateral lobes then the anterior lobe**
7. **ensure haemostasis and trimming of edges**
8. **insertion of three way urethral catheter**
9. **traction**

*** Complications:**

- 1- **Bleeding.**
- 2- **TUR syndrome.**
- 3- **Perforation.**
- 4- **Incomplete resection.**
- 5- **Incontinence.**
- 6- **Retrograde ejaculation.**
- 7- **Stricture urethra.**

5- URETEROSCOPY

*** Instruments**

- 1- **Ureteroscope (semirigid – flexible).**
- 2- **Ureteral dilators (Balloon-Teflon).**
- 3- **Dormia – disintegrators.**
- 4- **Guide-wire (Floppy tip Teflon)**

*** Indications:**

- 1- **Ureteral stone.**
- 2- **Ureteral stricture.**
- 3- **Upper tract hematuria.**
- 4- **Upper tract filling defect.**

Steps of ureteroscopy

1. **position: lithotomy**
2. **sterilization**
3. **towling**

4. *uethroscustoscopy*
5. *visualization of the ureteric orifice*
6. *insertion of the guide wire*
7. *ureteral dilatation*
8. *introduction of the uretroscope*
9. *dealing with the pathology (stone – stricture)*
10. *stenting of the ureter*

* Complications:

- 1- *Failure of visuculization of ureteric orifice.*
- 2- *Failure of passage of guidwire.*
- 3- *False passage of guidwire.*
- 4- *Perforation.*
- 5- *Failure of stone disintegration or extraction.*
- 6- *Ascending infection.*
- 7- *Stricture (ureteral and/or urethral).*

6- NEPHROSCOPY

* Instruments:

- 1- *Nephroscope.*
- 2- *Disintegrators.*
- 3- *Dilator system.*
- 4- *Forceps.*
- 5- *Guid wire (J-tip wire)*

* Indications:

- 1- *PCNL.*
- 2- *Endopylotomy.*
- 3- *Tumour ablation.*
- 4- *Stricture upper ureter.*

* PCNL procedure:

- *General or regional anesthesia.*
- *Lithotomy position for fixation of ureteral catheter.*
- *Turn the patient to prone position.*
- *Puncture the target calyx through the center of it's fornix under X-ray or Ultrasound guidance.*
- *Dilatation of tract under fluoroscopic control.*
- *Introduction of nephroscopy.*
- *Extraction or disintegration of stone.*
- *Inspection for residual stone and for any musosal injury.*
- *Injection of contrast to exclude exbavasation.*
- *Leave the nephrostomy tube till unrie clearance.*

* Complications:

- 1- Perforation and extravasations.
- 2- Bleeding.
- 3- Injury of adjacent organs (colon – duodenum).

Practical training

The practical training will consist of training with help of lectures , video and simulators which are effective simple and affordable teaching method in endourology .

Needs Assessment:

Aucest will continue to assess the needs of endourologic programs both in term of training and overall program needs. Safe techniques for basic skills are an essential part of all procedures . Perioperative care and good anesthetic management can make a significant difference in the outcome for patients undergoing endoscopic procedure . Last but not the least there is no substitute for thorough training and the urologist's discretion regarding the case he chooses to operate.