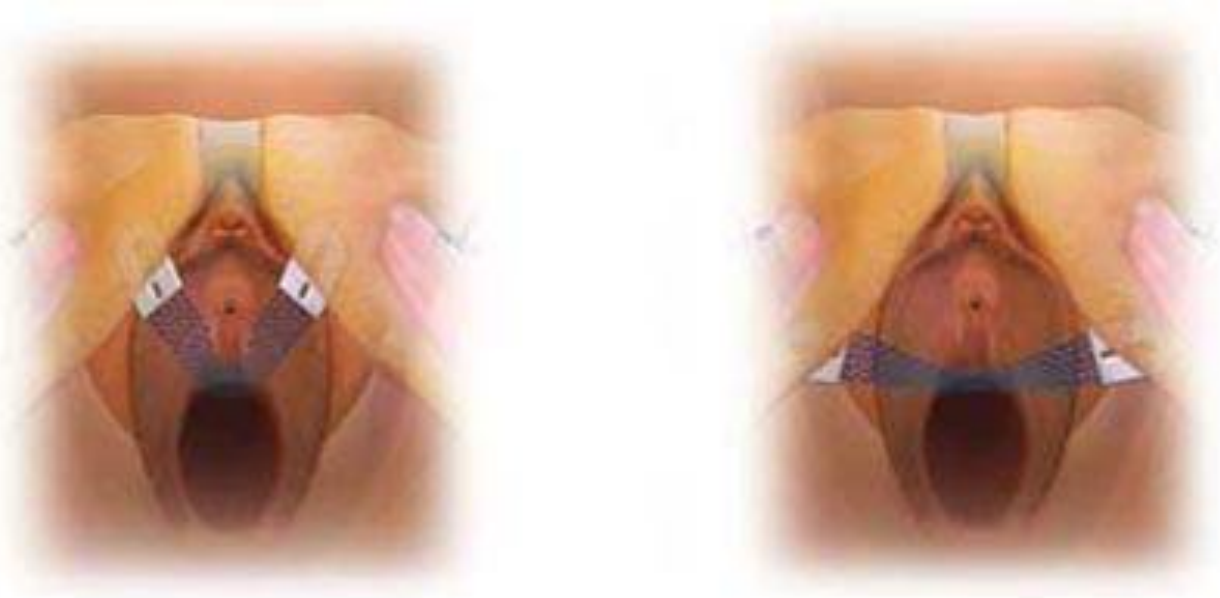
Tension Free Transvaginal Tape

R.K.Mishra

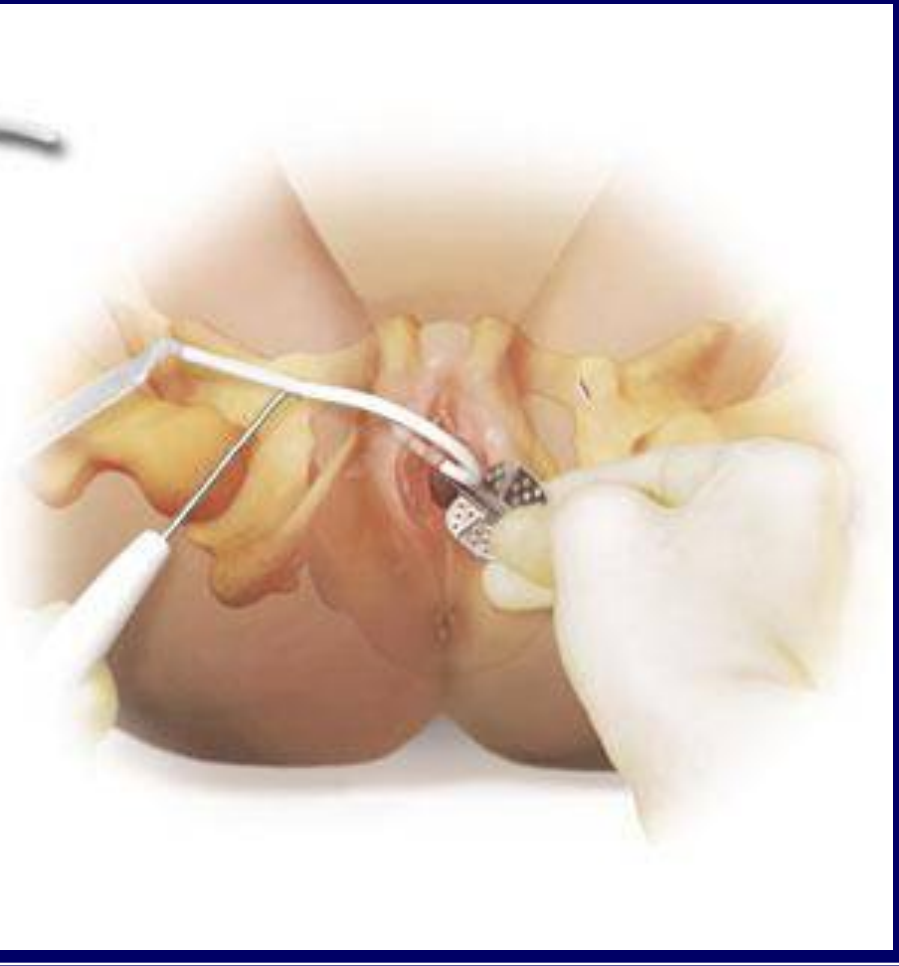
History

Tension-free vaginal tape, or TVT, as it is commonly referred to, was first introduced in 1995 by Ulmsten in Europe and subsequently started being used in the United States in 1998.

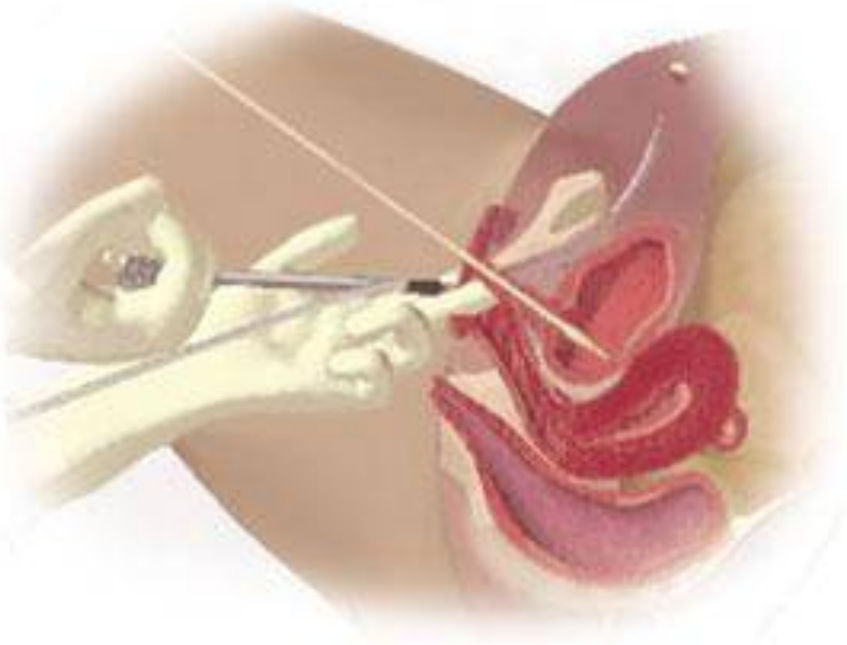


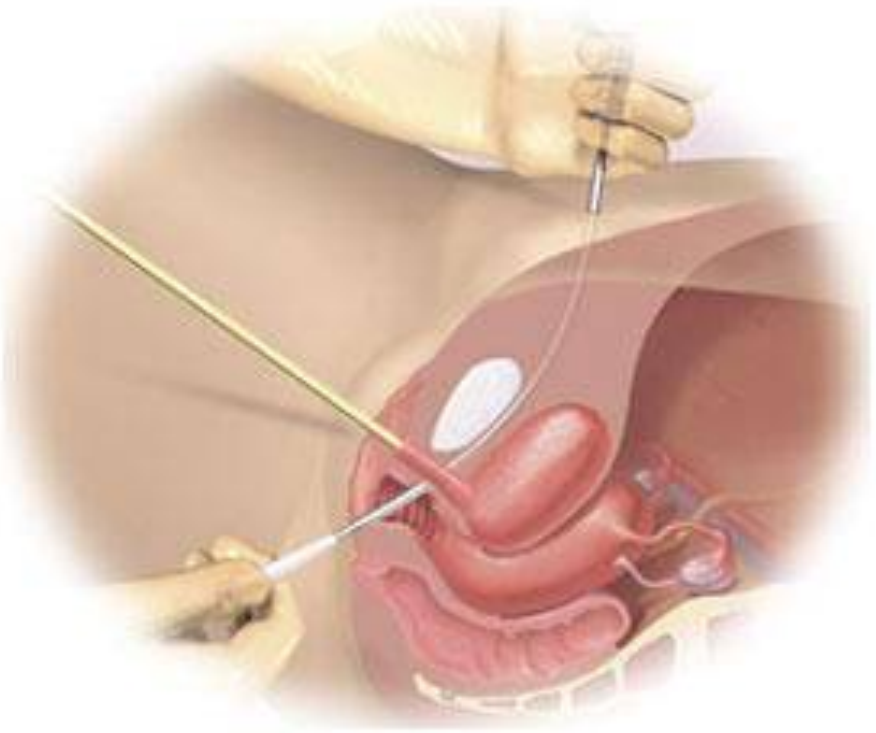
TVT

Procedure



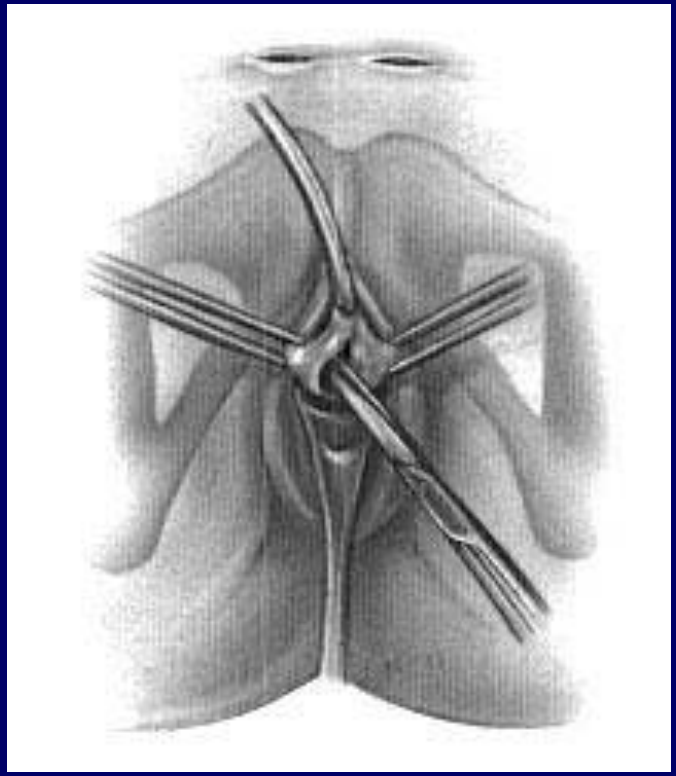
Procedure





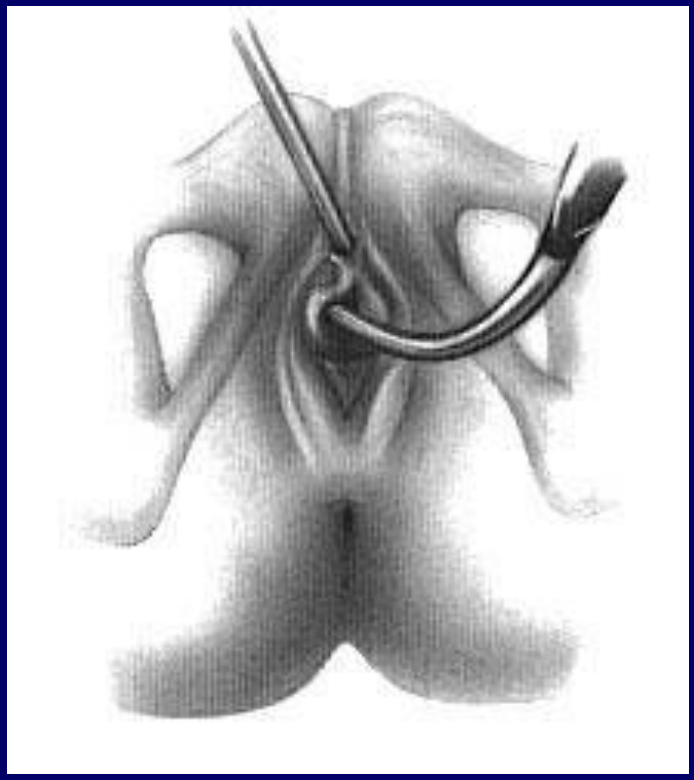
Procedure

Paraurethral dissection is performed after an initial midline incision on the anterior vaginal mucosa at the level of the midurethra. Note the small suprapubic abdominal incisions bilaterally.



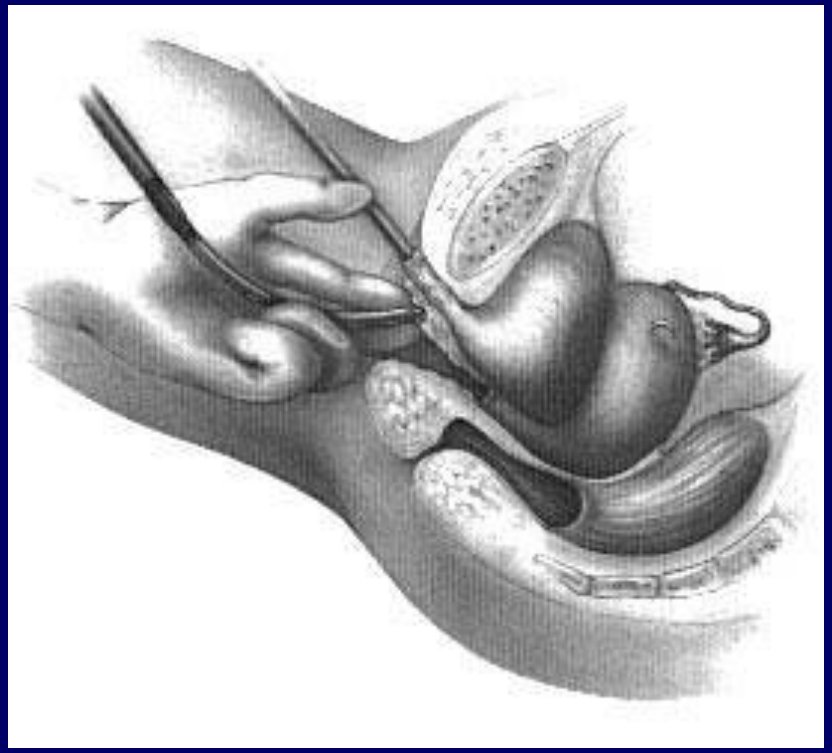
Procedure

After bilateral dissection of the paraurethral space, the rigid catheter guide is inserted into the urinary catheter. The handle of the guide is deflected to the ipsilateral side and the needle is inserted into the paraurethral space.



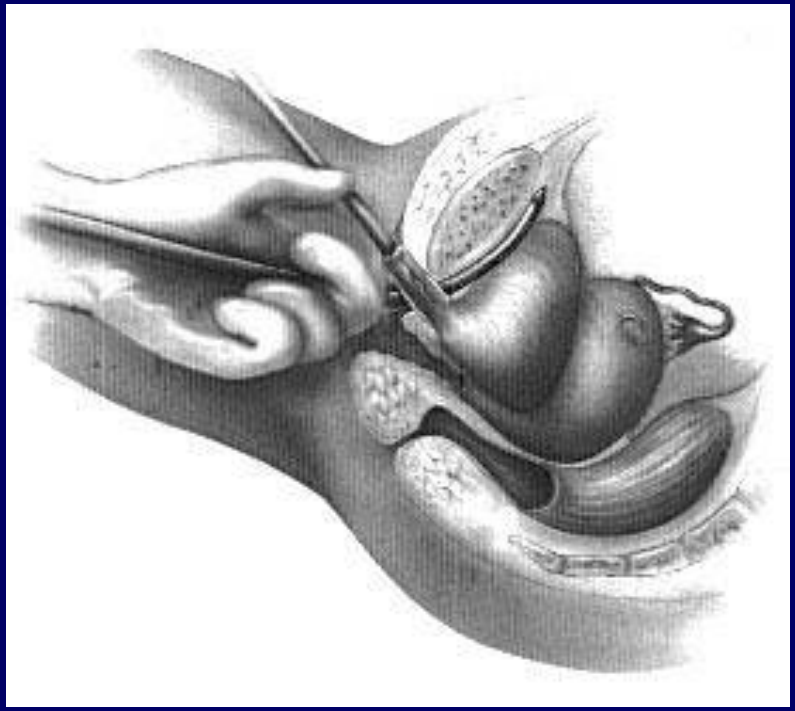
Procedure

The tip of the needle is angulated laterally and the endopelvic fascia is perforated just behind the inferior surface of the pubic symphysis.



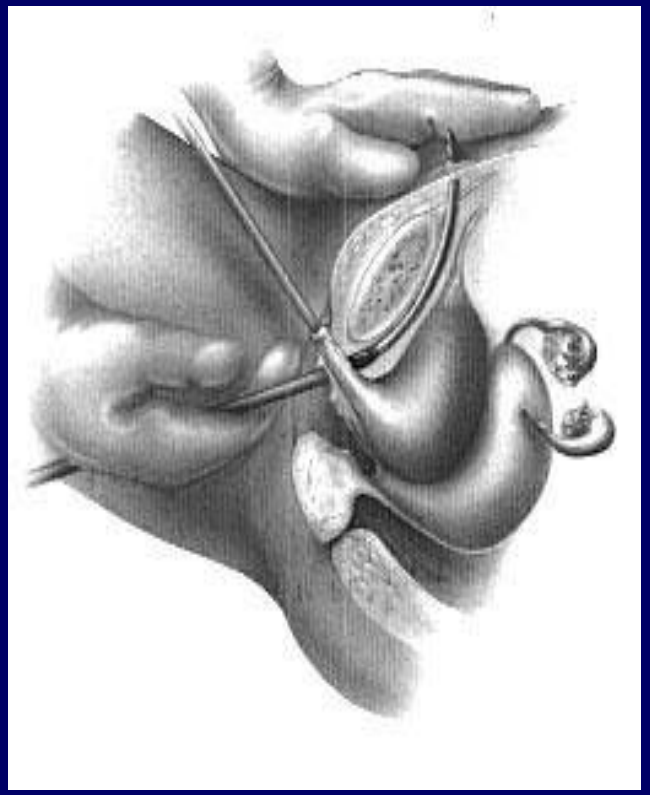
Procedure

After perforation of the endopelvic fascia, the tip of the needle is guided through the retropubic space along the backside of the pubic symphysis.



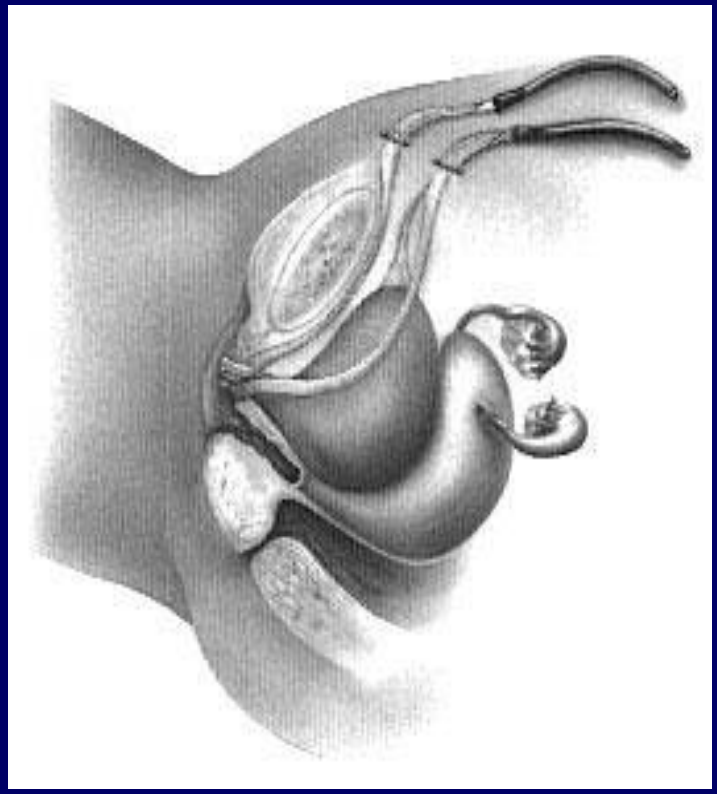
Procedure

After perforation of the rectus fascia, a hand is used to palpate the needle tip suprapubically and guide the needle to the abdominal incision.



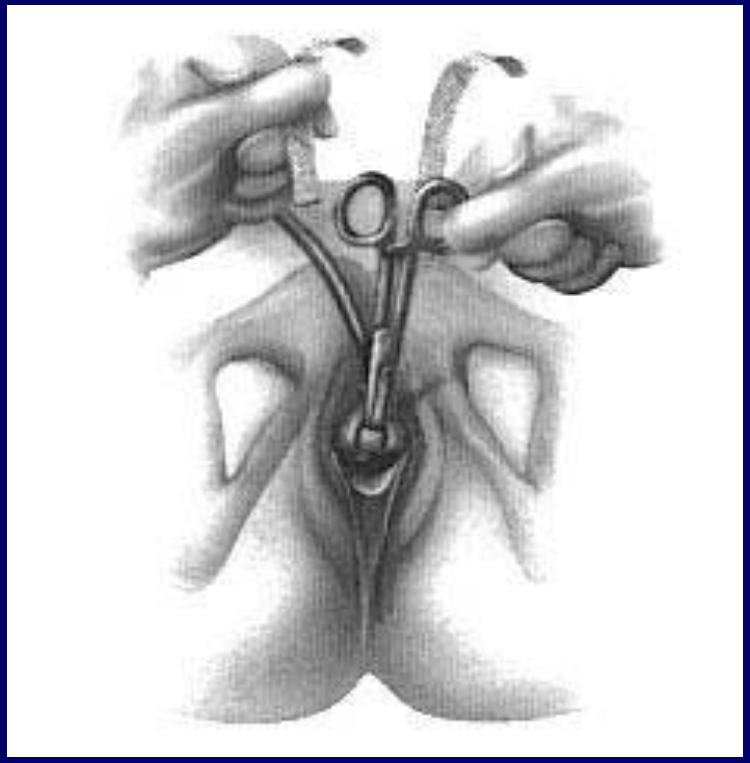
Procedure

After the technique is repeated on the other side, the TVT sling is in place with the tape lying flat against the posterior surface of the midurethra.



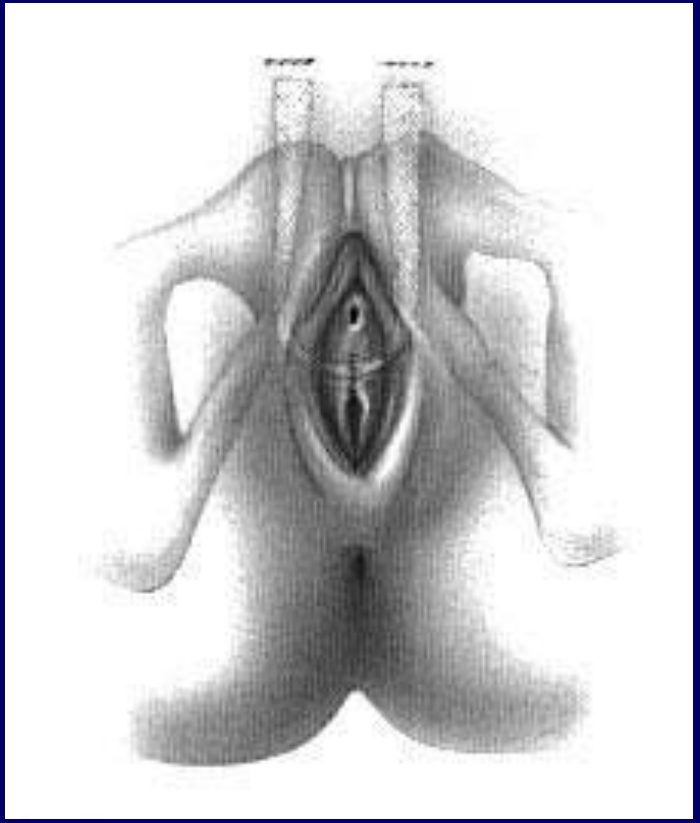
Procedure

The needles are detached and an instrument is placed between the tape and the urethra. Gentle traction on each end brings the tape in contact with the urethra and correct tension is adjusted with an intraoperative cough stress test.



Procedure

The incisions are closed.
The completed procedure
allows fixation of the tape
below the
midurethra with
the ends just below
the skin level.



Anaesthesia

- Initially, the bladder is emptied with an 18 French Foley catheter.
- The catheter balloon will help the surgeon identify the bladder neck to help direct the local anaesthesia injections.
- The local anaesthesia should be injected bilaterally via a long spinal needle in the skin and abdominal wall just above the pubic symphysis, downward posterior to the pubic bone through the space of Retzius.
- The anaesthesia should be injected along the intended course of the needle.

Anaesthesia

The vaginal speculum should be inserted to expose the anterior vaginal wall.

The local anaesthesia is injected sub-urethral, starting approximately 1.0 cm from the external urethral meatus and moving proximally.

The local anaesthesia is injected on each side of the urethra toward the bladder neck in to the retropubic space.

The surgeon should then wait three to four minutes for the anaesthesia to take effect.

Abdominal/Suprapubic Incisions & Single Vaginal Incision

- A vaginal incision with blunt dissection produces a space lateral to the urethra, which becomes the starting position for each of the TVT sling needles.
- Two abdominal incisions are performed first at the intended exit points with the needles just superior to the pubic symphysis.

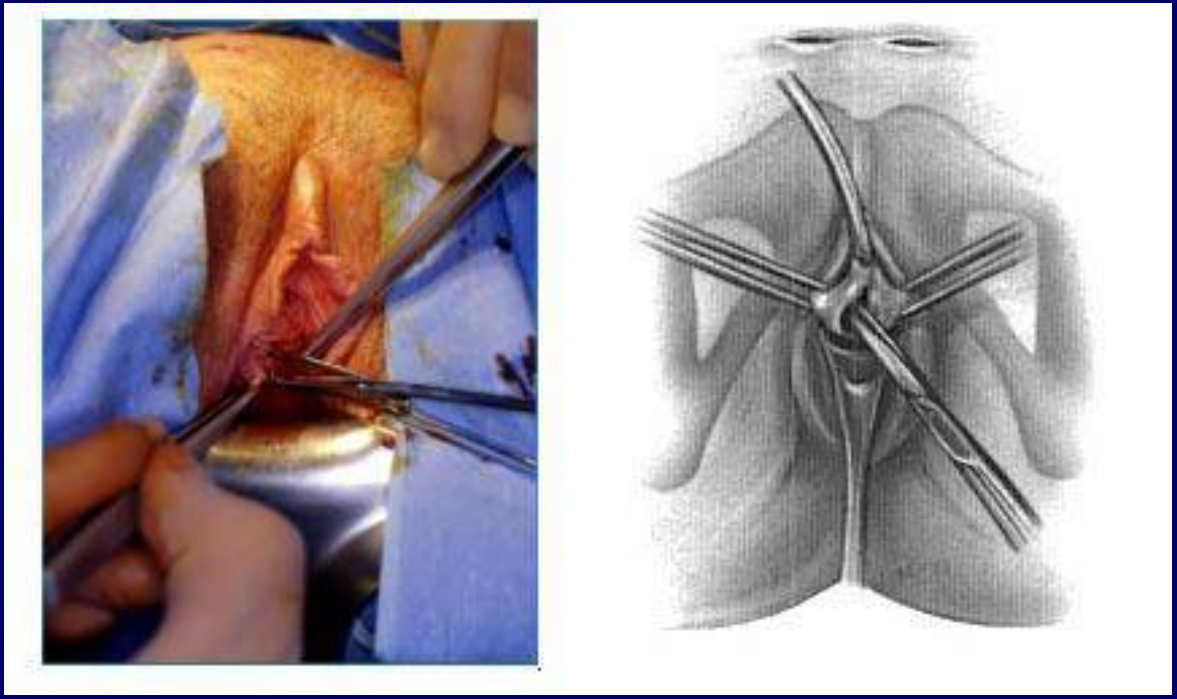
Procedure

- The key steps for this part of the procedure are:
- Determining the location of the 1 cm bilateral abdominal incisions
- Determining the location of the 1.5 cm mid-urethral anterior vaginal incision

Single Vaginal Incision

The anterior vaginal wall overlaying the mid urethra is elevated with Allis clamps and incised vertically in the midline. The incision should begin approximately 1 cm from the external urethra meatus and extend proximally for 1.5 cm. The incision should be long enough to accommodate the width of the TVT sling.

Procedure



Metzenbaum scissors are used to mobilize a flap of the vaginal mucosa (1 cm) on each side of the urethra. The dissection should be limited to the vaginal mucosa by only moving laterally. Care should be taken not to puncture the pubocervical fascia or the urethra.

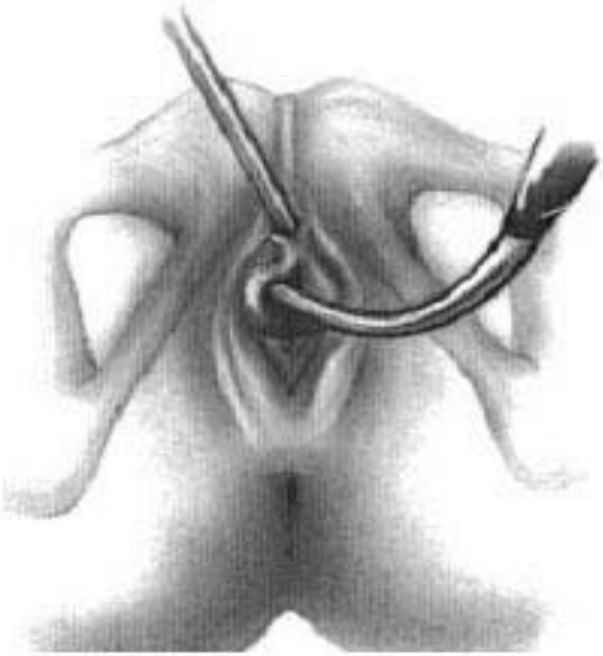
TVT Sling and Device Placement

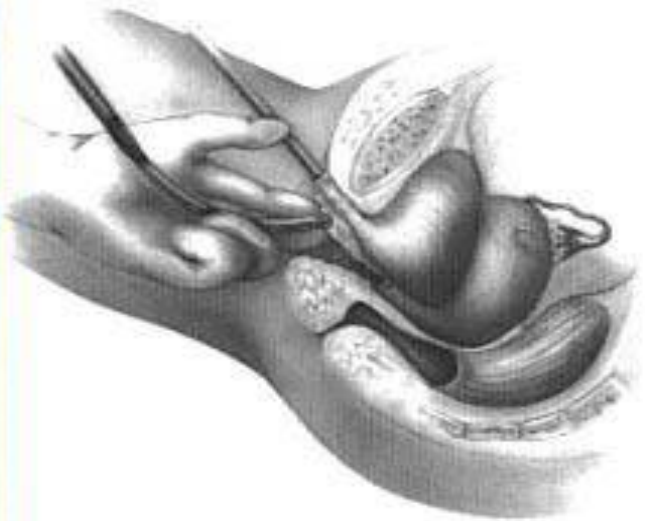
During this step, the surgeon insert the TVT needle into the vaginla incision, through the periurethral fascia, into the retropubic space (Space of Retzius) and upward until the needle comes through the abdominal incisions. Correct placement, positioning and movement of the introducer needle during the procedure are critical.

Key points and steps:

- Vaginal finger guidance
- Initial alignment of the needle tip toward the ipsilateral shoulder until the endopelvic fascia has been perforated.
- Immediate upward deflection of the tip of the needle upon piercing of the pelvic fascia, passing behind the inferior ramus staying close to the posterior aspect of the symphysis

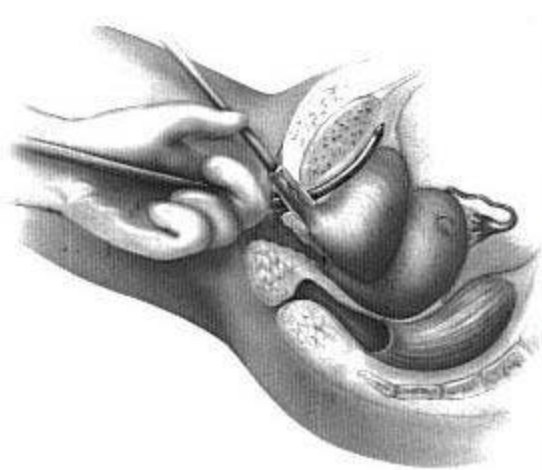
Insertion of Needle





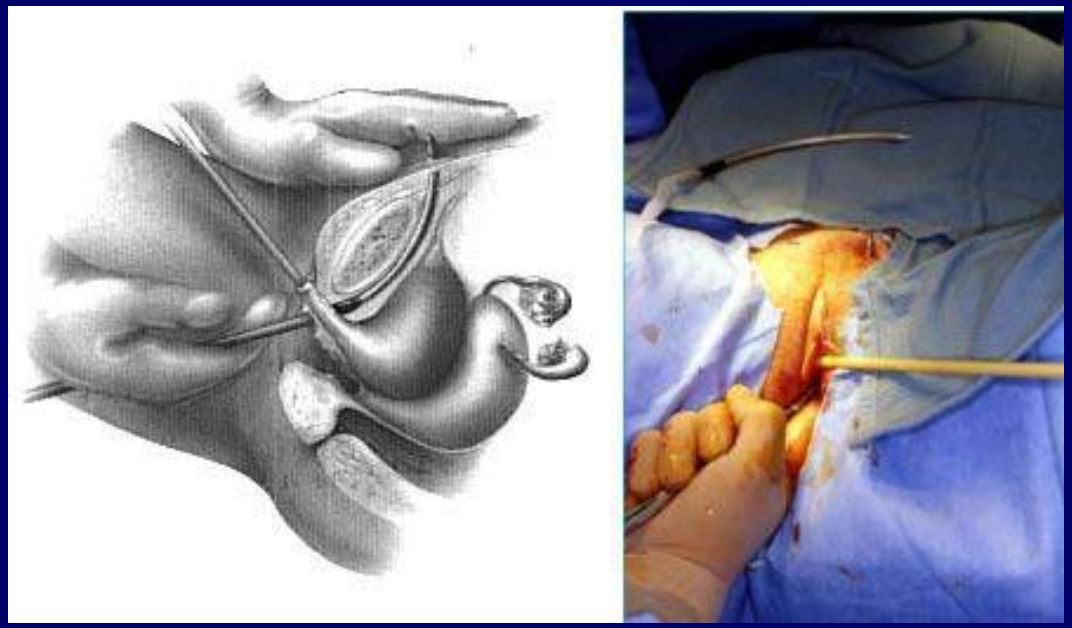
Two hands are required to pass the needle. The surgeon should concentrate on the role of each hand. Position the needle tip through the vaginal incision directed lateral to the urethra. When passing the needle, the vaginal mucosa is between the surgeon's finger and the tip of the needle.

Insertion of Urethral Guide



Palpate the inferior ramus laterally and the urethra medially with the straight catheter guide inside. Once the endopelvic fascia has been penetrated beneath the inferior ramus, the handle of the needle is directed downward and pressure is applied upward by the hand in the vagina. The force advancing the needle actually comes form the palm or the thumb of the vaginal hand and the vaginal finger guiding it. The second hand is used to direct the back end of the handle. It determines the angle and steers the needle. The second hand does not torque or advance the needle.

Insertion of Needle



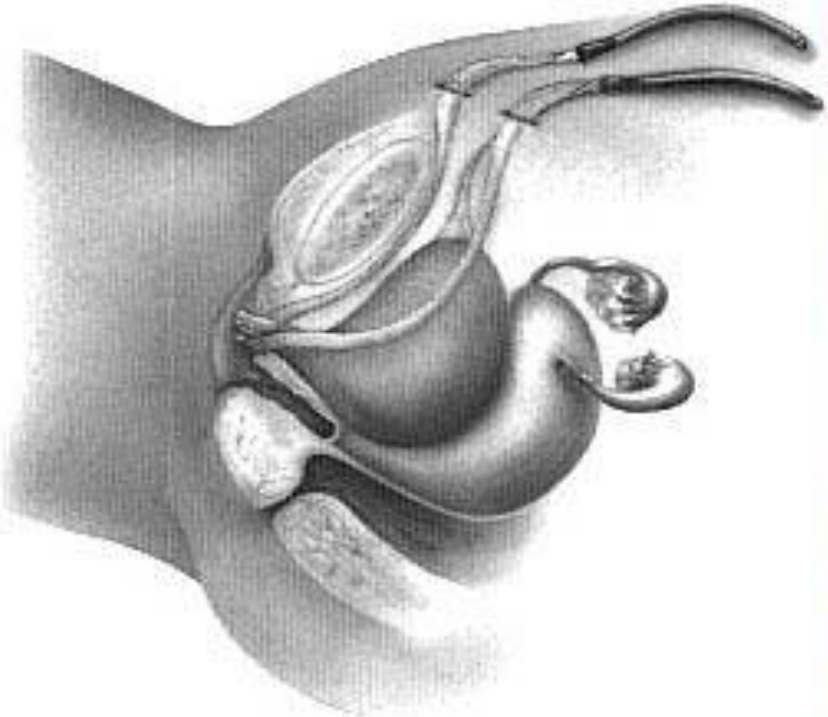
Once the needle tip has been passed through the abdominal incision the handle can be disconnected. The needle should not be pulled completely though to the abdomen until cystoscopy has verified its position.

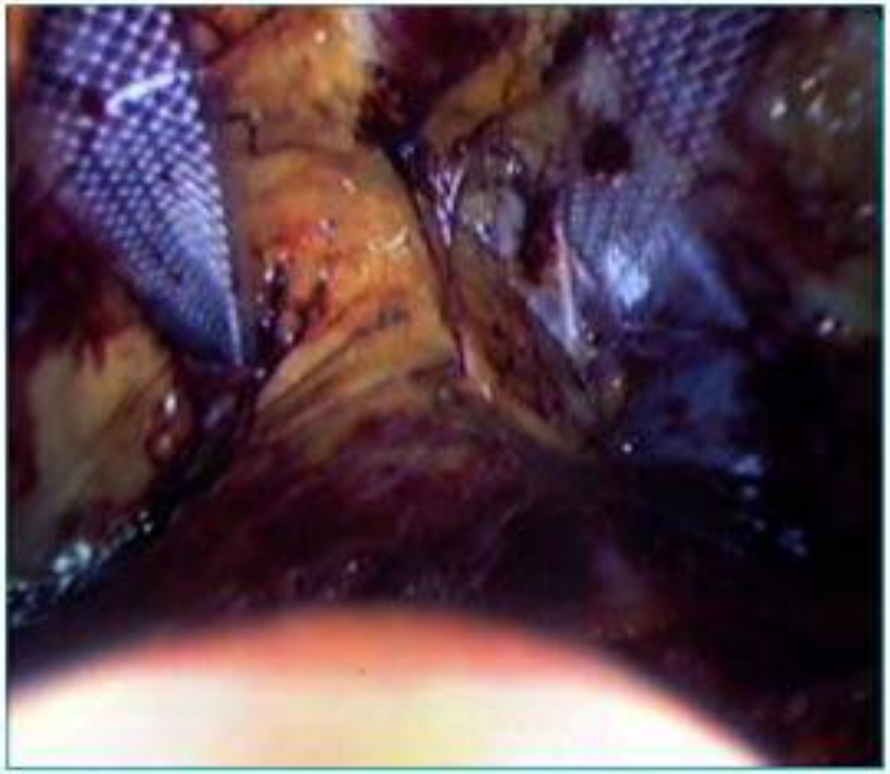
Laparoscopic View of TVT needles

Cystoscopic Evaluation

- After each pass of needle, cystoscopy is performed with needle in place extending from the vagina to the abdomen. In the event of a perforation, the needle will be easy to identify so it can be removed and re-introduced The surgeon must have cystoscopy privileges to perform this critical step of the procedure. During cystoscopy, the bladder should be distended to at least 250-300 cc of fluid. Using a 70-degree lens, the cystoscope is rotated and the bladder is inspected for perforations, which often occur at the one o'clock and 11 o'clock positions on the anterior wall of the bladder. The bladder neck should also be inspected.
- After bladder integrity has been confirmed the TVT needles are pulled through the tissues and placed on the abdomen

Laparoscopic View





"looser is better than tighter."

- The cough test should be conducted with a full bladder (250cc or saline). The surgeon should coordinate the procedure with the anesthesiologist so the patient is awake to cooperate during the tension test
- The patient is asked to cough again and the tape is adjusted until only one or two drops of urine leak

Remove Plastic sheath and Cut Excess Abdominal Tape

Excision of Excess Tape

- There is no need to suture or anchor the abdominal ends of the TVT sling. The friction of the 1.1cm wide tape coming through a hole produced by a .5 cm needle is enough to maintain the tape in place at both the pubocervical fascia and anterior abdominal wall fascia and muscle. The skin and vaginal epithelium are closed. The bladder is emptied and the catheter is removed.

CONTRAINDICATIONS

- As with any suspension surgery, these procedures should not be performed in pregnant patients.
- Additionally, because the PROLENE* polypropylene mesh will not stretch significantly, it should not be
- Performed in patients with future growth potential including women with plans for future pregnancy.

WARNINGS & PRECAUTIONS

- Patients who are on anti-coagulation therapy.
- Patients who have a urinary tract infection.
- Patient should be counselled that future pregnancy may negate the effects of the surgical procedure and the patient may again become incontinent.
- In case of pregnancy, delivery via caesarean section should be considered.
- Post-operatively, refrain from heavy lifting and/or exercise (e.g. cycling, jogging) for at least three to four weeks and to refrain from intercourse for one month. The patients can usually return to other normal activity after one or two weeks.

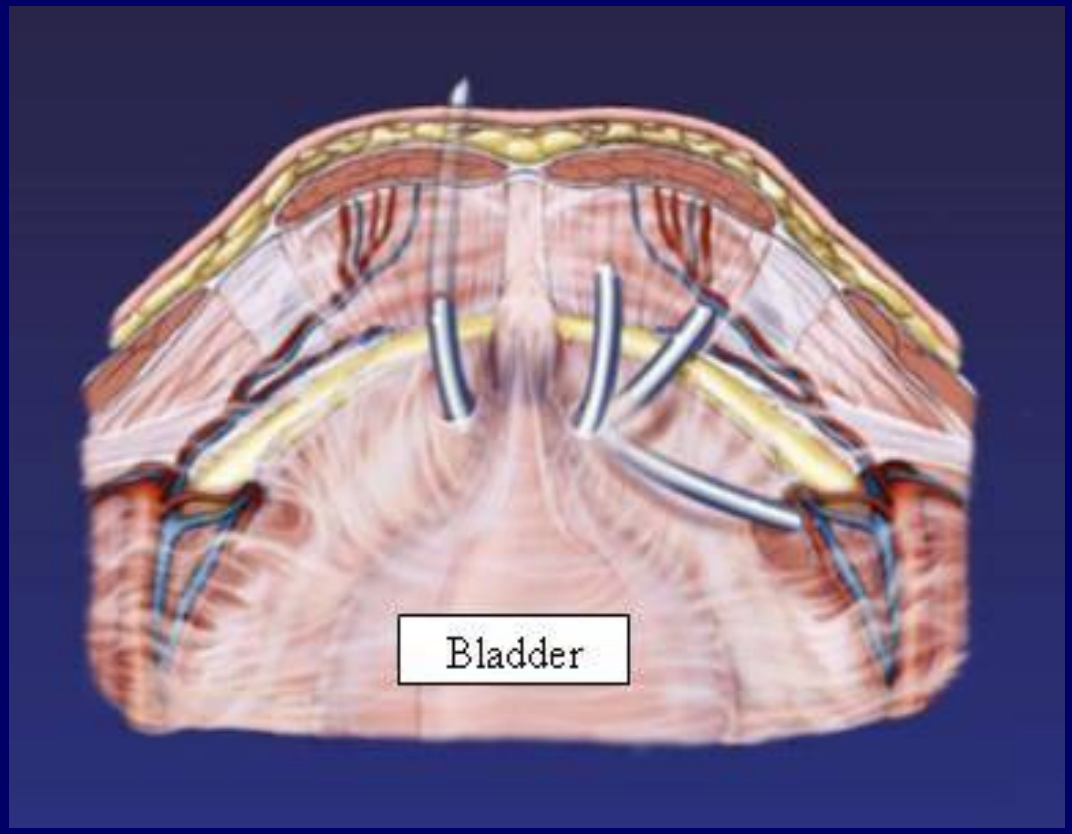
ADVERSE REACTIONS

- Punctures or lacerations or injury to vessels, nerves, bladder, urethra, or bowel may occur during
- Instrument passage and may require surgical repair.
- Improper placement of the TVT device may result in incomplete or no relief from urinary incontinence or
- May cause urinary tract obstruction.

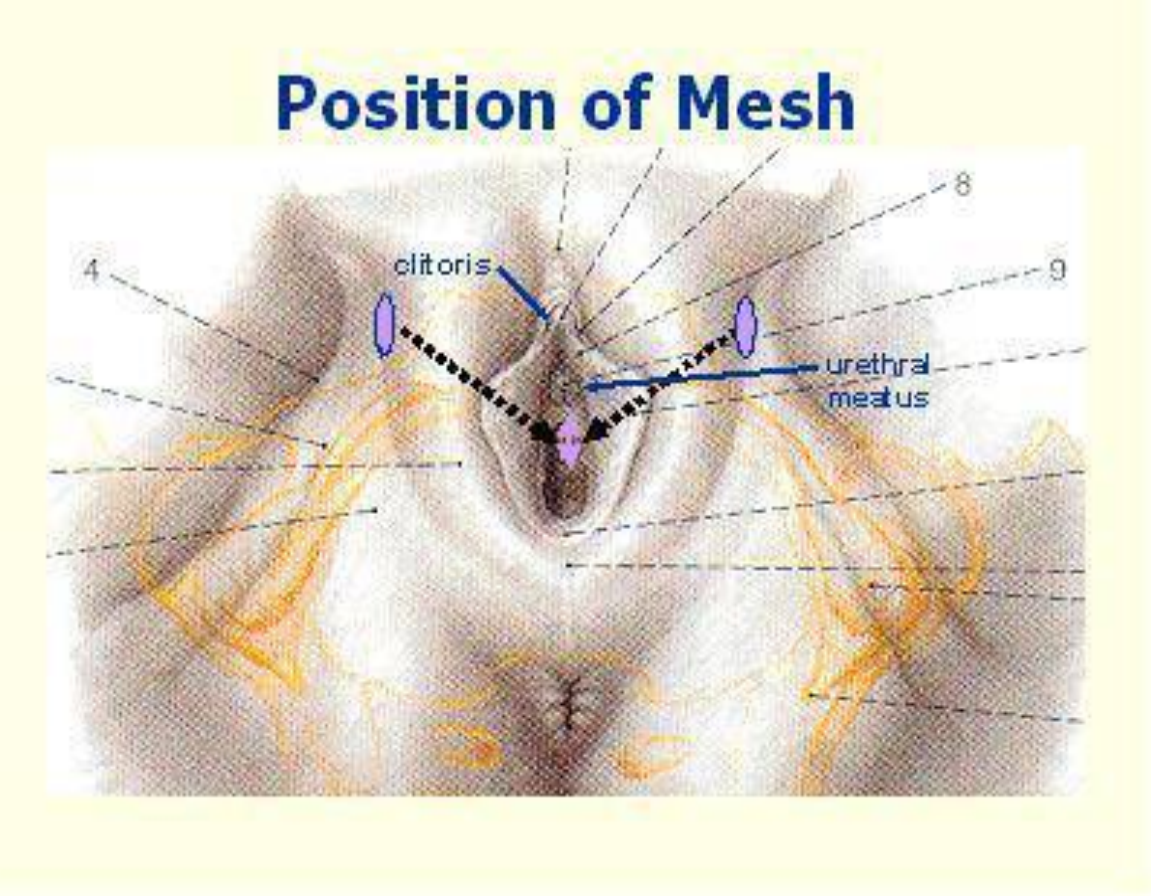
TVT VS TOT

- Although the TVT complication rate is very low, there is a greater chance of damage to abdominal viscera and the bladder because of the entry into the anterior abdominal cavity.
- By contrast, the TOT approach avoids almost all major structures. The only potential area of concern is that around the obturator vessels.
- However, the location of these vessels is on the opposite side of where the needles are placed.
- Obturator vessels are at least 3.5 cm away from the "safe zone" where the needle is inserted.
- Additionally, the time to perform the procedure is on average 10 minutes, indicating that this procedure is even easier than the TVT with regard to placement.

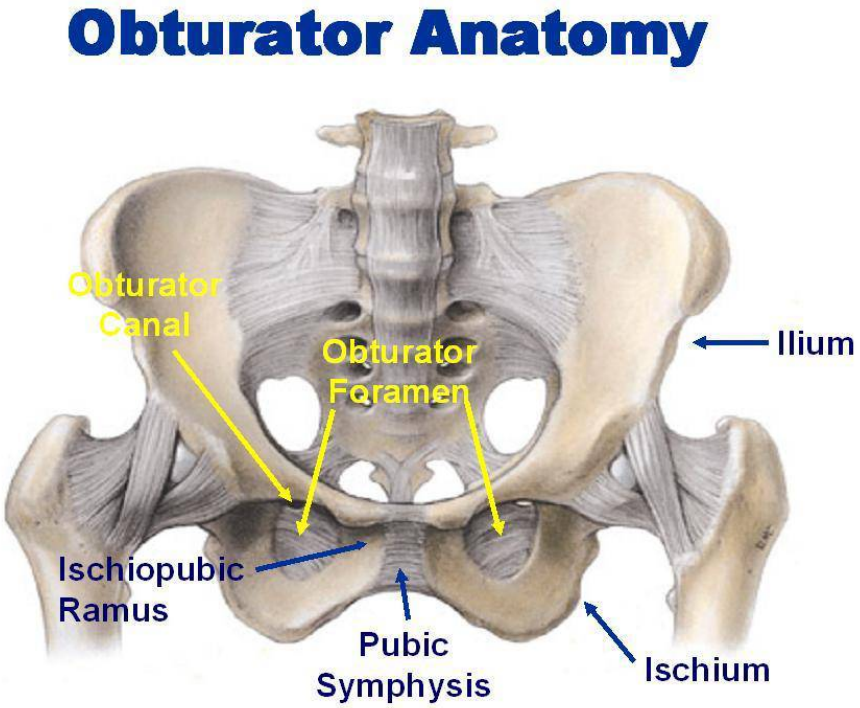
Why TOT

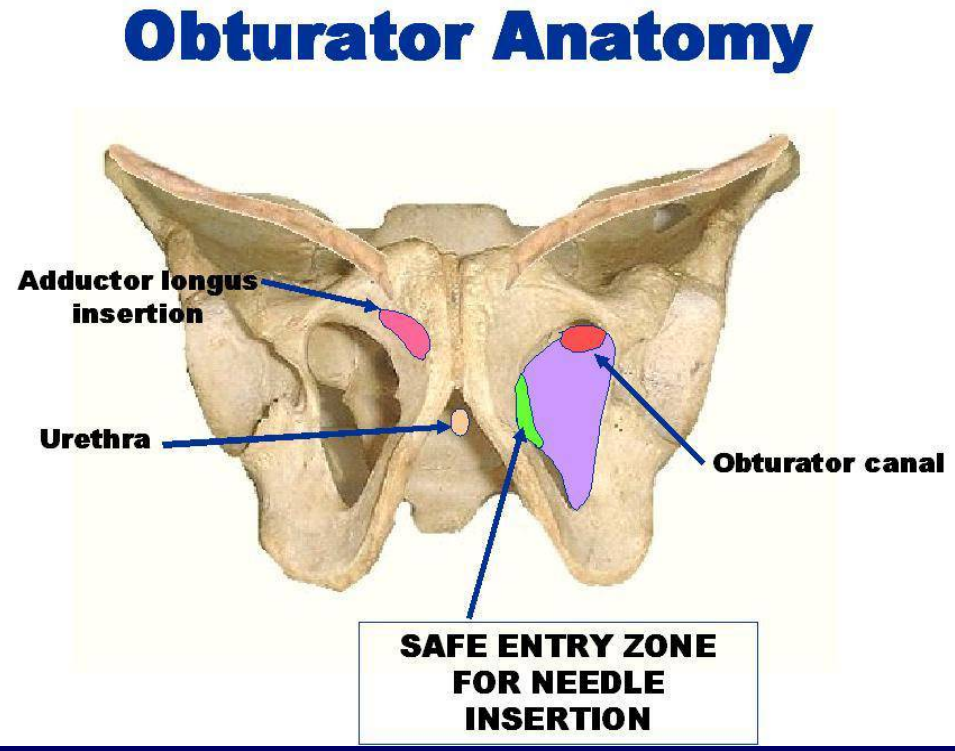


Obdurater Foramen



Obturator Anatomy

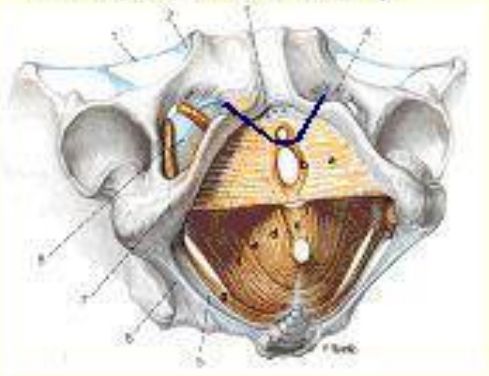




Pubourethral Ligament.

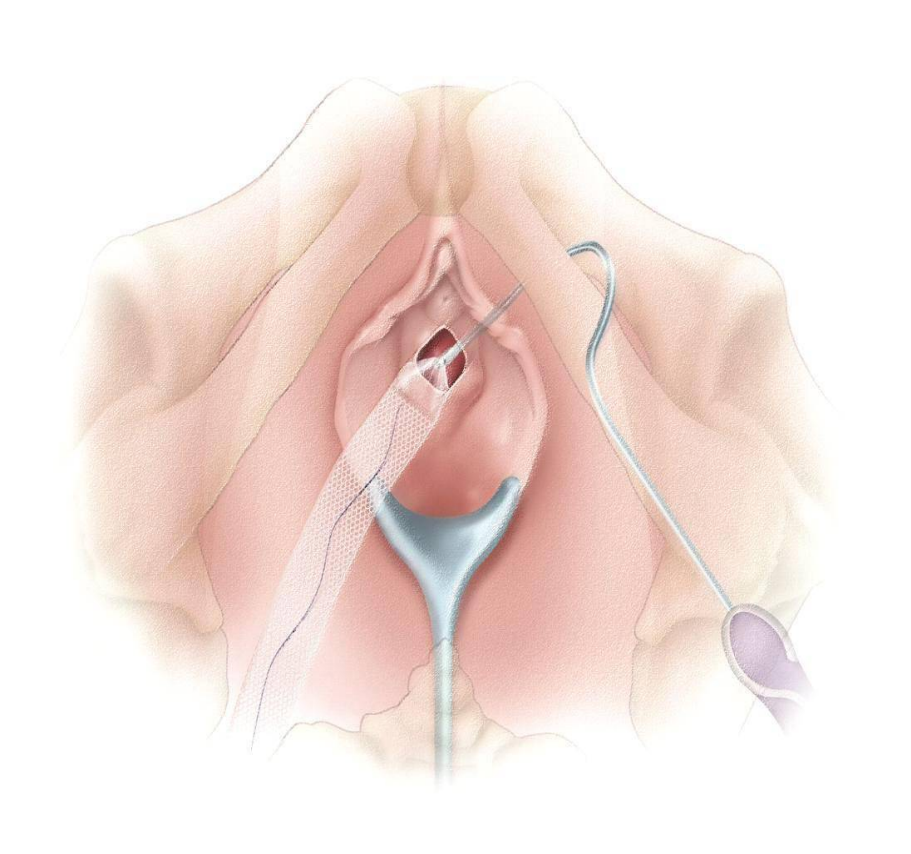
Subfascial Hammock Mimics Pubourethral Ligament

Monarc™ Subfascial Hammock mimics normal anatomy

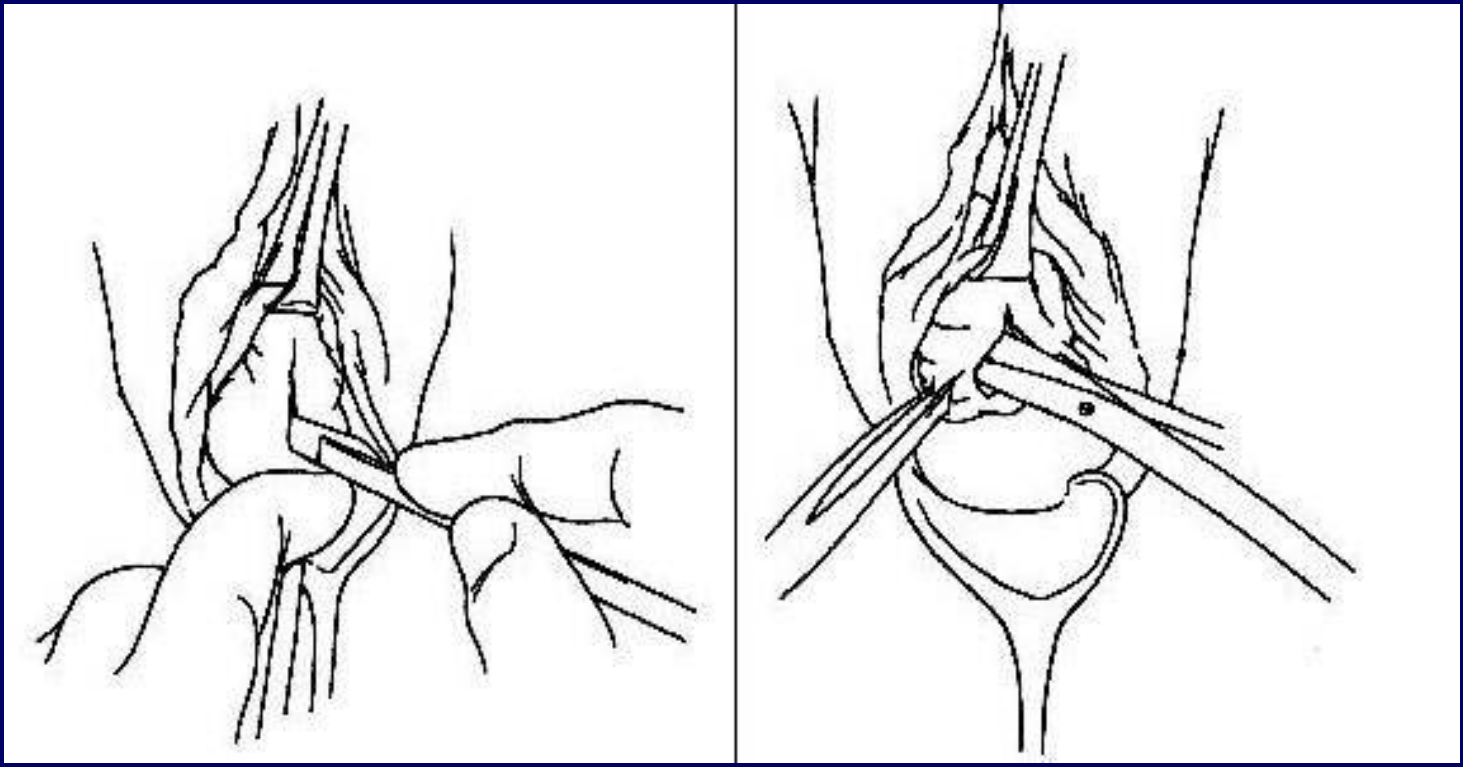


Normal pubourethral ligament support - DeLancey

TOT Sling

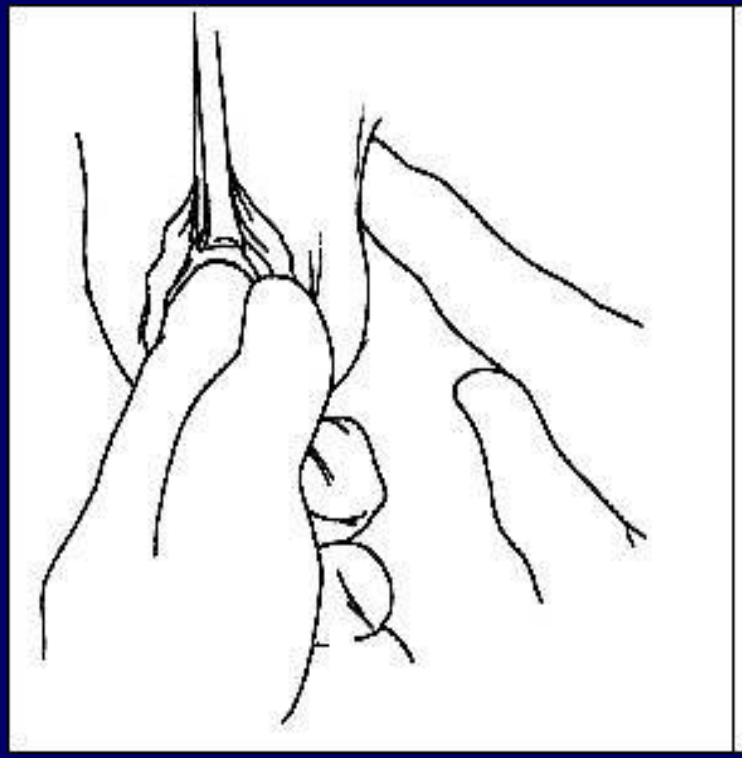


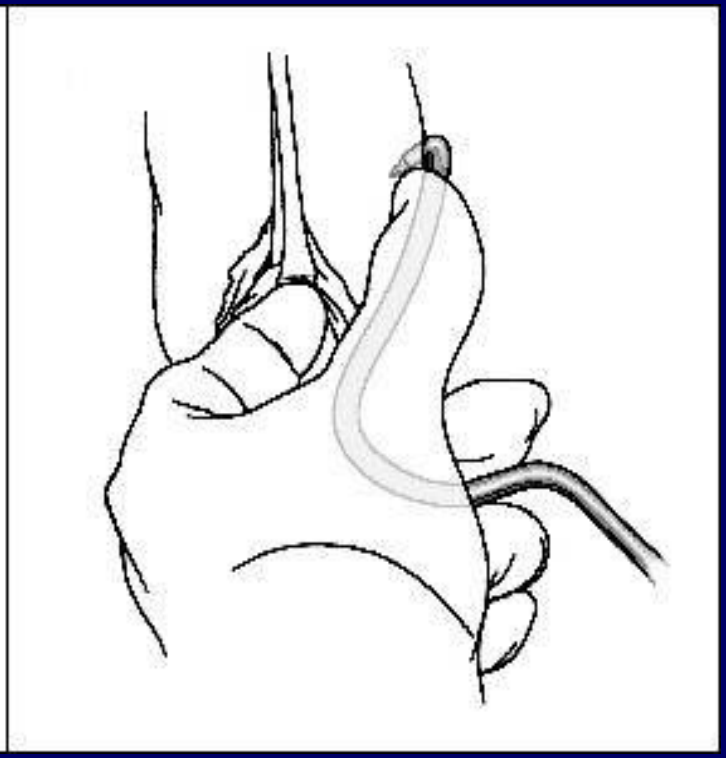
Vaginal Incision



Vaginal epithelium is dissected below the the urethra

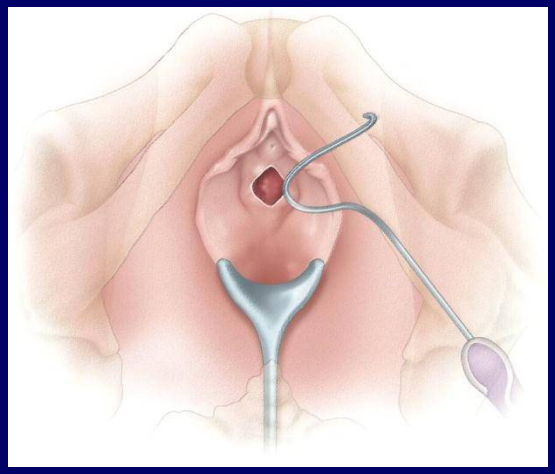
Groin Incision

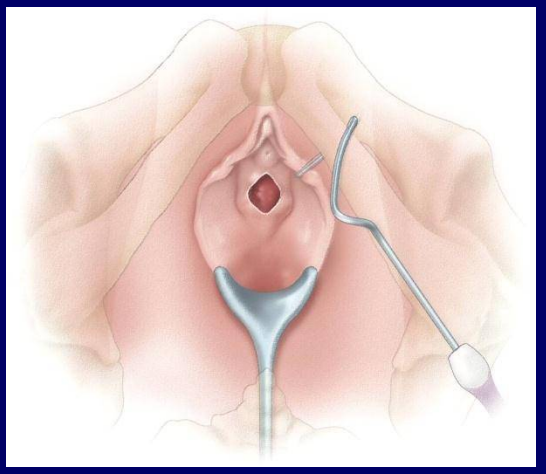




Area of groin incision located 1cm inferior to adductor longus tendinous insertion at the level of clitoris.

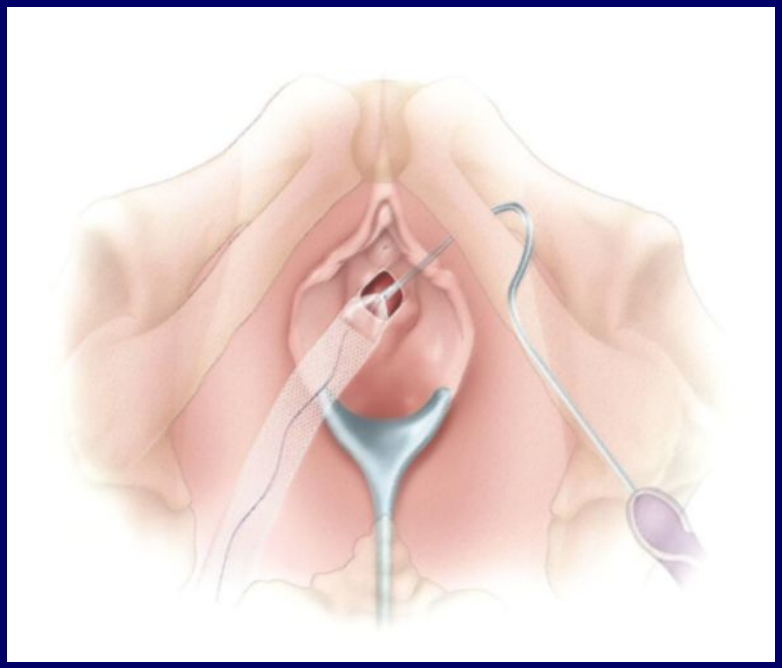
Insertion of Needle

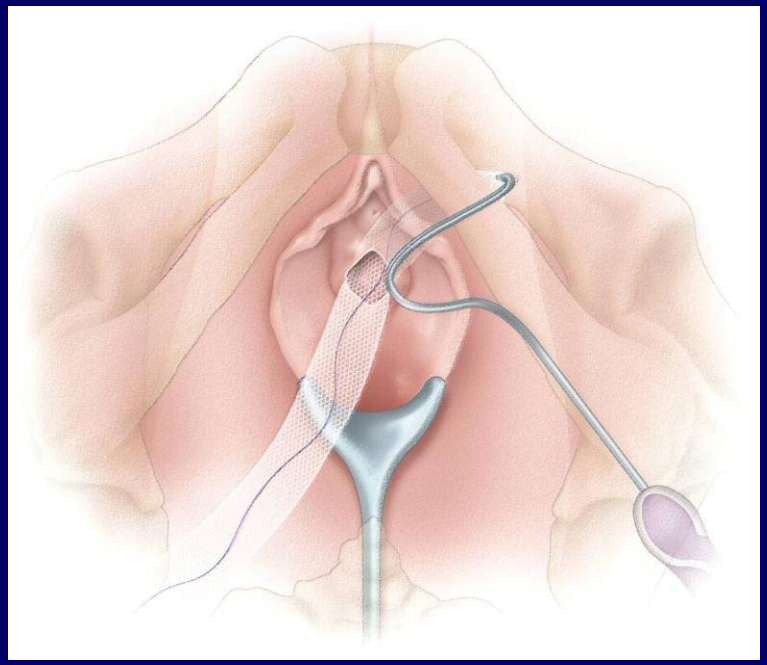




The needle is passed through the groin incision, through the obturator membrane and muscles and brought into the vaginal incision.

Tape is pulled through the groin incision





Connected tape is then brought back through the groin incision.

- Ethicon TVT
- Ethicon TOT

Ending the Procedure

Needle and tape is passed on the opposite side. Tape is then adjusted with an intra-operative cough test and adjusted until no leakage occurs. Excess mesh is cut off at the groin incisions and these are closed with steri-strips and vaginal incision is closed with absorbable suture.

Thank You

Batch May 2008 at India Habitat Centre