OBSTETRICS AND GYNECOLOGY SOP

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OBSTETRICS AND GYNECOLOGY SOP TOPICS

CONTRIBUTORS

FMOH Team

1. Hassan Mohamed Beshier (MD, MPH) Director, Health Service Quality Directorate, MOH
2. Berhane Redae Meshesha (MD, PhD) Assistant professor of surgery Technical advisor, Jhpiego, MOH, SPHMMC
3. Desalegn Bekele Taye Dessalegn Bekele (MD), Assistant Director, Health Service Quality Directorate, MOH
4. Getachew Yimam Adem (BSC, MPH), Officer, Surgical Service Improvement case team, MOH
5. Eyobed Kaleb Bereded (BSC, MPH), Officer, Surgical Service Improvement case team, MOH
6. Tadesse Shiferaw (BSC), Officer, Surgical Service Improvement case team, MOH
7. Mikiyas Tefferi Yecheneku (MD), Officer, Surgical Service Improvement case team, MOH

ESOG Team

- Dr. Dereje Nigussie (MSC), ObGyn, Abt Associate
- Dr. Fikru Zeleke, ObGyn, Adama Teaching Hospital
- Dr. Fikremelekot Temesgen ObGyn, Maternal Fetal Medicine Specialist, Addis Ababa University
- Dr. Zelalem Mengistu, ObGyn, Urogynecology and Reconstructive Pelvic Surgery Specialist, University of Gondar
- Dr. Dawit Worku, ObGyn, Gynecology Oncology Specialist, Addis Ababa University
- Dr. Lemi Belay, OBGyn, Reproductive Health Specialist, Saint Paul's Hospital Millennium Medical College
- Dr. Zelalem Ayichew, ObGyn, Urogynecology and Reconstructive Pelvic Surgery fellow, University of Gondar
- Dr. Tamiru Minwuye, ObGyn, Urogynecology and Reconstructive Pelvic Surgery fellow, University of Gondar
- Fitsum Taye (BSC, MSC), Professional Association of Emergency Surgical officers of Ethiopia (PAESOE)

- Melese Takele (BSC, MSC), Professional Association of Emergency Surgical officers of Ethiopia (PAESOE)

First and Second Degree Perineal Tear Repair

INTRODUCTION

A perineal tear is a laceration of the skin and other soft tissue structures. There are four degrees of tears that can occur during delivery:

- First degree tears involve the vaginal mucosa and connective tissue.
- Second degree tears involve the vaginal mucosa, connective tissue and underlying muscles.
- Third degree tears involve complete transection of the anal sphincter.
- Fourth degree tears involve the rectal mucosa
- Rectal button-hole tear: the tear involves rectal mucosa with an intact anal sphincter complex.

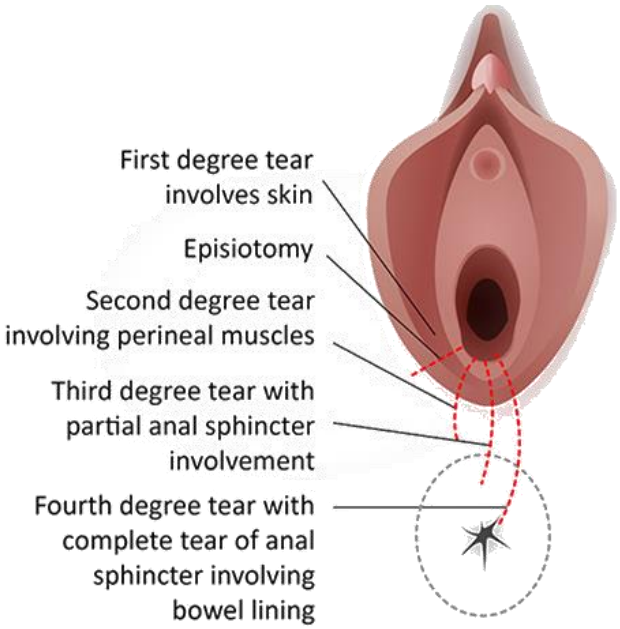


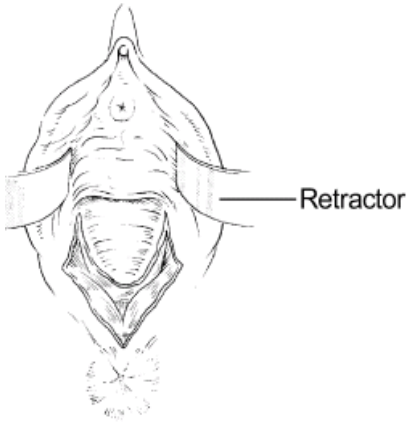
Fig: Types of tears

REPAIR OF FIRST AND SECOND DEGREE TEARS

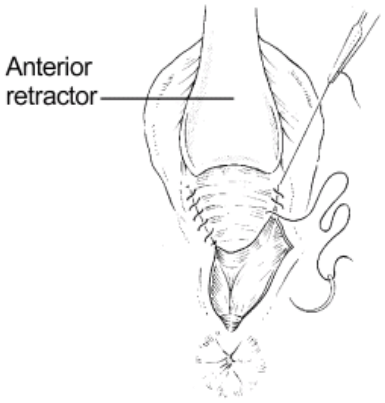
During repair of first and second degree tears:

- Provide emotional support and encouragement.
- Use local infiltration with lidocaine. If necessary, use a pudendal block.
- Ask an assistant to massage the uterus and provide fundal pressure.
- Carefully examine the vagina, perineum and cervix.
- If the tear is long and deep through the perineum, inspect to be sure there is no third- or fourth-degree tear:
    - Place a gloved finger in the anus;
    - Gently lift the finger and identify the sphincter;
    - Feel for the tone or tightness of the sphincter.
- Change to clean, high-level disinfected gloves.
- Apply antiseptic solution to the area around the tear.
- Make sure there are no known allergies to lidocaine or related drugs.
- Infiltrate beneath the vaginal mucosa, beneath the skin of the perineum and deeply into the perineal muscle using about 10 mL 0.5% lidocaine solution.
- After injection, wait for 2 minutes and then pinch the area with forceps. If the woman feels the pinch, wait 2 more minutes and then retest.
- The apex of the vaginal laceration is identified. For lacerations extending deep into the vagina, using retractor facilitates visualization.
- An anchoring suture is placed 1 cm above the apex of the laceration, and the vaginal mucosa and underlying rectovaginal fascia are closed using a running unlocked 2-0 suture. If the apex is too far into the vagina to be seen, the anchoring suture is placed at the most distally visible area of laceration, and traction is applied on the suture to bring the apex into view.
- The running suture is carried to the hymenal ring and tied proximal to the ring, completing closure of the vaginal mucosa and rectovaginal fascia.
- Identify the muscles of the perineal body on each side of the perineal laceration.
- Repair the perineal muscles using interrupted 2-0 suture, If the tear is deep, place a second layer of the same stitch to close the space.
- Repair the skin using interrupted (or subcuticular) 2-0 sutures starting at the vaginal opening.

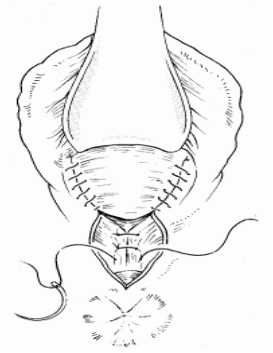
- If the tear was deep, perform a rectal examination. Make sure no stitches are in the rectum.



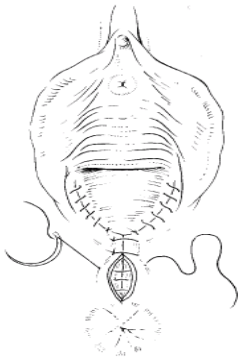
1. Exposing perineal tear



2. Vagina mucosa repair



3. Perineal muscle repair



4. Skin repair

Fig: second degree repair

NB: *Most first degree tears close spontaneously without sutures.*

Episiotomy

INTRODUCTION

Episiotomy is a surgical cut made at the opening of the vagina during childbirth, to aid difficult delivery and prevent rupture of tissues. Episiotomy is type of artificially made second degree tear.

The recommended type of incision is mediolateral episiotomy which starts from the center of the forchette and extend 3cm diagonally.

The anatomic structures involved in a mediolateral episiotomy include the vaginal epithelium, transverse perineal muscle, bulbocavernosus muscle, and perineal skin.

INDICATIONS

- Threat for a perineal tear
- perineal resistance for fetal head descent
- fetal/ maternal distress to expedited delivery
- complicated vaginal delivery (breech, shoulder dystocia, forceps, vacuum);
- scarring from female genital cutting or poorly healed third or fourth degree tears;

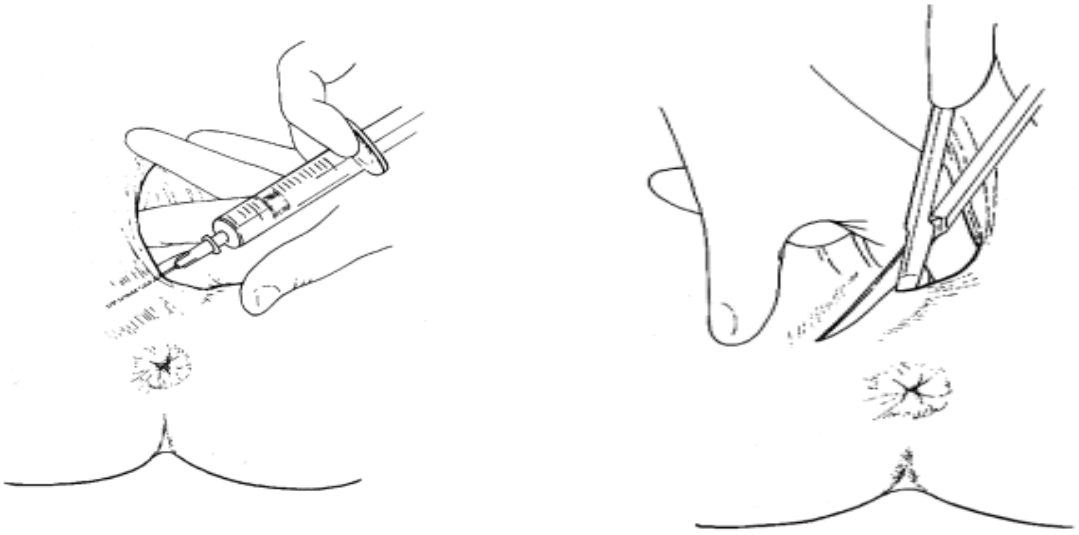
OPERATIVE TECHNIQUES OF MEDIOLATERAL EPISIOTOMY

Timing of the incision

- When the head is crowning
- When the posterior buttock distend the perineum
- It should not be made too early and too late

Making the incision

- Position the patient in lithotomy
- Wearing high-level disinfected gloves, place two fingers in the vagina and administer local analgesia for episiotomy using lidocaine 0.5% (10 ml).
- Wait for two minutes after injection of lidocaine.
- Place the index and middle fingers into the vagina between the fetal head and the perineum.
- Wait until the perineum is thinned out and 3–4 cm of the baby's head is visible during uterine contraction.



1. Local infiltration ***2. Making incision***

Fig: mediolateral episiotomy

- The incision is made using scissors starting at the posterior fourchette and continued downward at an angle of at least 45° relative to the perineal body. (avoid incision on the previous scar)
- The incision can be performed on either side and is generally 3-4 cm in length.
- Control bleeding after making incision by applying gauze swap or applying artery clamp to bleeders.

Repairing

Episiotomy tears should be sutured within one hour.

- Examine the extent of the laceration after delivery, carefully evaluating for possible extension to third- or fourth-degree laceration.
- Pack the upper vagina to prevent blood coming from the uterus.
- Adequate lighting to visualize and determine the extent of laceration
- The apex (top) of the episiotomy site is identified, and suture is secured approximately 1 cm proximally.
- The submucosal tissue and vaginal mucosa are reapproximated in a continuous fashion to the level of vaginal opening using absorbable stitches No. 2/0 or 0.

- At the opening of the vagina, bring together the cut edges of the vaginal opening;

1. Mucosa ***2. Muscle*** ***3. skin***

Fig: mediolateral episiotomy repair

- Bring the needle under the vaginal opening and out through the incision and tie.
- Close the perineal muscle using interrupted absorbable sutures 2-0 size.
- Close the skin using interrupted (or subcuticular) 2-0 sutures

POST PROCEDURE CARE

- Keep the hygiene and clean wound care
- Foul smelling discharge /pus report immediately
- Advice not to strain and avoid constipation
- Routine use of antibiotics should be avoided

COMPLICATIONS

- Wound infection
- Hemorrhage
- Dysparunia (sexual difficulty)
- Sphincter damage/ rectal damage

Third and Forth Degree Perineal Tear Repair

DEFINTION

- Third degree tears involve complete transection of the anal sphincter.
- Fourth degree tears involve the rectal mucosa

OPERATIVE TECHNIQUES

Repair of third and fourth degree perineal tear should be performed in the operation theatre under regional or general anaesthesia, with good lighting and with appropriate instruments.

- Provide emotional support and encouragement.
- Use a pudendal block or ketamine.
- Ask an assistant to massage the uterus and provide fundal pressure.
- Examine the vagina, cervix, perineum and rectum.
- See if the anal sphincter is torn:
    - Place a gloved finger in the anus and lift slightly;
    - Identify the sphincter, or lack of it;
    - Feel the surface of the rectum and look carefully for a tear.
- Change gloves.
- Apply antiseptic solution to the tear and remove any faecal material, if present.

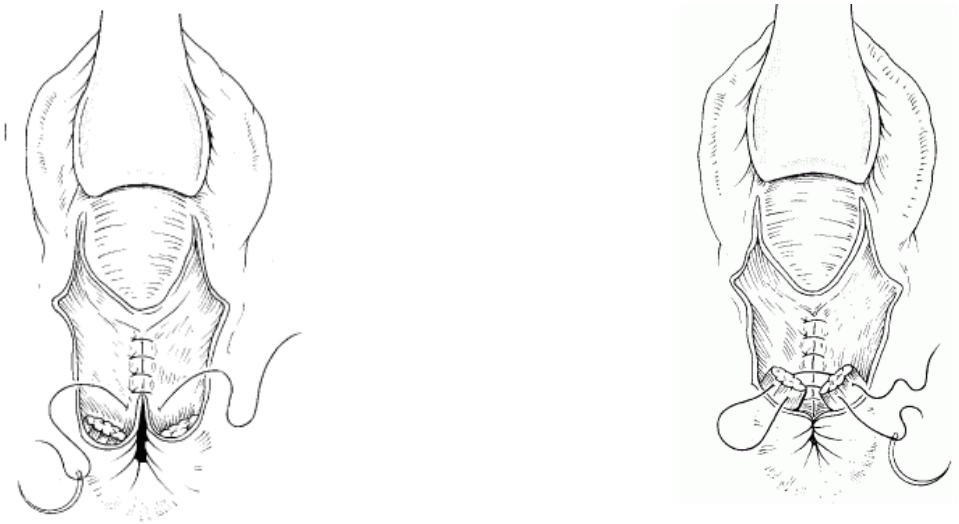
Closing the rectum (fig)

- Repair the rectum using interrupted 3-0 or 4-0 sutures 0.5 cm apart to approximate the mucosa. i.e. Place the suture through the muscularis (not all the way through the mucosa).

Suturing anal sphincter

- Identifiy the internal anal sphincter (glistening, white, fibrous structure between the rectal mucosa and the external anal sphincter)
- Cover the muscularis layer by suturing the fascial layer with interrupted sutures
- Apply antiseptic solution to the area frequently.
- Grasp each end of the sphincter with an Allis clamp (the sphincter retracts when torn). The sphincter is strong and will not tear when pulling with the clamp
- Repair the sphincter with two or three interrupted stitches of 2-0 suture using end to end or overlapping technique.

- Apply antiseptic solution to the area again.
- Examine the anus with a gloved finger to ensure the correct repair of the rectum and sphincter.
- Perform rectal examination after the repair to ensure that sutures have not been inadvertently inserted through the anorectal mucosa. If a suture is identified it should be removed.



1. *Closing the muscle wall of the rectum*
2. *Suturing anal sphincter*

Fig: 4th degree repair

Repair of vaginal mucosa, perineal muscles and skin

- Change gloves and repair the vaginal mucosa, perineal muscles and skin.
    - *Vaginal mucosa* – with 2-0 running
    - *Perineal body and muscles* – 2-0 interrupted
    - *Perineal skin* – running subcuticular with 3-0 stitch

Delayed closure:

- If closure is delayed for more than 12 hours, infection is inevitable. In such cases, delayed primary closure is indicated.

POST-PROCEDURE CARE

Broad spectrum antibiotics

- Ampicillin 500 mg by mouth;

- PLUS metronidazole 400 mg by mouth.

Diet

- Rectal mucosa not involved
    - Regular diet
- Rectal mucosa is involved,
    - Low-residue diet for several days and advanced to a regular diet
    - Give stool softener by mouth for 1 week, but diarrhea should be avoided because of the increased likelihood of infection.

Wound care

- Sitz baths
- Follow up closely for signs of wound infection.
- Avoid giving enemas or rectal examinations for 2 weeks.

COMPLICATIONS

- Hematoma
- Infection
- Wound dehiscence
- Necrotizing fasciitis
- Faecal incontinence
- Rectovaginal fistula

Cervical Tear Repair

Bleeding which occurs despite a well-contracted uterus and which does not appear to be arising from the vagina or perineum is an indication for examining the cervix.

Suspect a tear in cases of postpartum haemorrhage where there is good uterine retraction and uterine rupture has been ruled out.

The source of the bleeding is discovered during inspection of the birth canal, with careful examination of the vagina and cervix using two vaginal retractors.

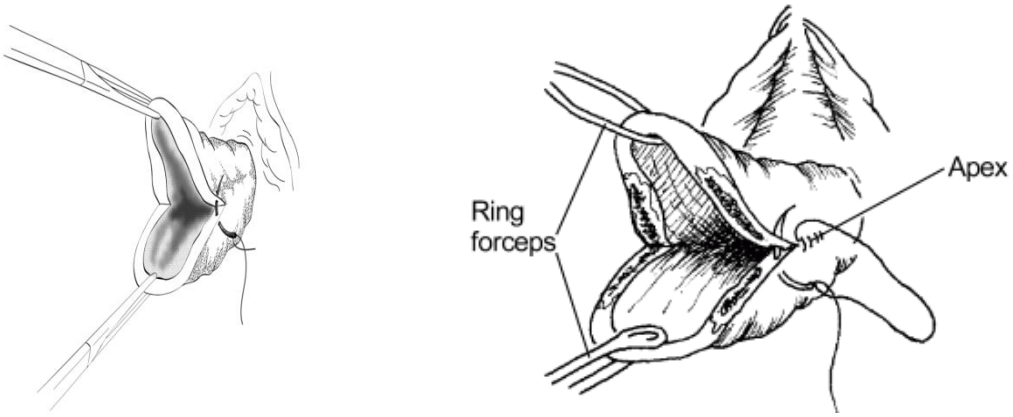
General infection prevention principles should be followed during examination and repair of cervical tears.

EXAMINING THE CERVIX

- Provide adequate pain medication
- Place the patient in lithotomy position
- Swab the perineum with 10% povidone iodine.
- An assistant is usually needed to present the tissues using retractors. Good lighting is essential.
- Gently pull the cervix toward the outside using atraumatic forceps (ring or sponge forceps) and assess the extent of the tears

REPAIR OF CERVICAL TEAR

- ***Small cervical tear, minimal bleeding:*** should heal spontaneously with no suturing and without complications.
- ***Larger cervical tear, heavy bleeding:***
    - Gently grasp the cervix with ring or sponge forceps.
    - Apply the forceps on both sides of the tear and gently pull in various directions to see the entire cervix. There may be several tears.
    - Close the cervical tears with continuous 0 (2-0) chromic catgut (or polyglycolic) suture starting above the apex of laceration (upper edge of tear).



1. *Cervical tear repair from the Apex*

2. Running suture from apex to secure hemostasis

Fig: Cervical Tear Repair

- The vaginal walls should also be sutured in the event of a bleeding laceration. For multiple vaginal lacerations with friable tissue that tears on suturing, insert a vaginal pack and remove after 24 hours. Insert a Foley catheter while the pack is in place
- If the tear extends up to the uterus (lower segment), transfer the patient to a surgical setting for laparotomy.

Dinfibulation

DEFINITION:

Deinfibulation is a minor surgical procedure performed, usually to open an infibulation (Type III FGM scar) for improving sexual intercourse, urine and menstrual flow, childbirth, and reduce the risks of associated complications.

OPERATIVE PROCEDURE PREPARATION

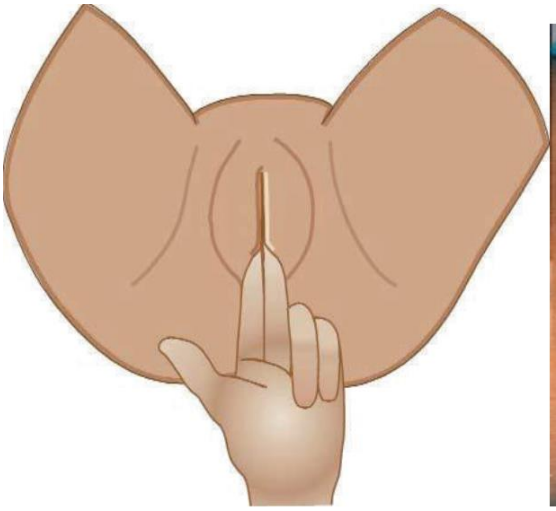
- Set the operation room(minor)and make ready the required equipment and materials tray (table)
- Place the patient in lithotomy position
- Wash your hands and dry with towel; put on gloves; expose the genitalia; and clean the perineal area with antiseptic swabs

Table: Medical equipment and materials required for deinfibulation procedure

- A pair of sterile gloves
- Antiseptic swabs and dressings
- A pair of straight or curved scissors
- A pair of suture scissors
- A pair of surgical tweezers (pinning forceps)
- A dilator (if available)
- Two artery forceps
- A needle holder
- A gallipot with sterile swabs
- 10 ml syringe and needles for injection
- Local anesthetic (such as lidocaine)
- 3-0 absorbable suturing material (catgut or vicryl)
- Sterile towel/ surgical cloth
- Antiseptic solution
- Lubricant
- Soap and water for handwashing

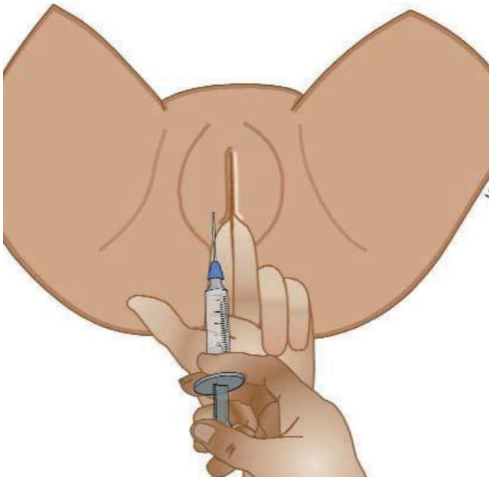
THE SURGICAL PROCEDURE

- Introduce index finger or forceps or dilator slowly and gently into the opening to lift the scar skin.

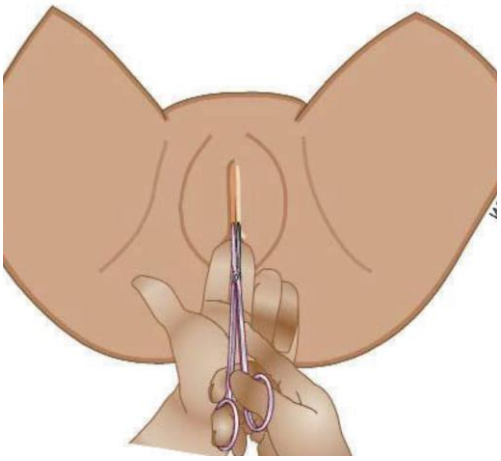


Introducing finger(s) under the scar

Introducing a dilator under the scar



Infiltrating the scar area with local anesthesia



Cutting and opening the scar

Fig: Deinfibulation

- Infiltrate 2–3 ml local anesthesia into the area where the cut will be made, along the scar and in both sides of the scar.
- After a while (giving some time for the local anesthesia to work), with your finger or dilator inside the scar, introduce the scissors and cut the scar alongside the finger or fingers to avoid injury to the adjacent tissues (or to the fetus, if the procedure is done during labor). Take care not to injure the urethral orifice with the tip of the scissor.
- The cut should be made along the mid-line of the scar towards the pubis. Incise the scar until the urethral meatus is clearly visualized.

- Take care that you do not cause injury to the structures along the scar. (It is not uncommon with type III FGM to find the structures below the scar intact, e.g. clitoris and labia minora.)
- Incise the mid-line to expose the urethral opening. Do not incise beyond the urethra. Extending the incision forward may cause hemorrhage, which is difficult to control. A cut of about 5-7 cm towards the urethra is usually appropriate.
- Suture the raw edges of the separated scar separately using fine 3/0 plain catgut or vicryl.
- Women should not be allowed to suffer from pain as this may reinforce negative ideas about being opened up. Therefore, analgesia should be prescribed following the opening up procedure.

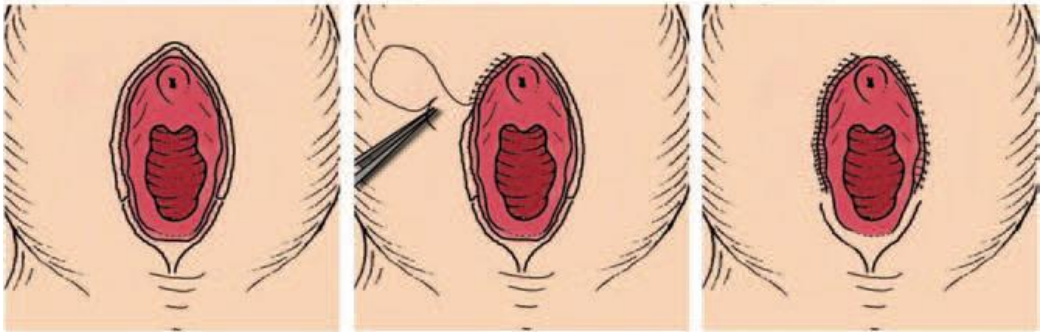


Fig: suturing of the bilateral excised scar edges.

INTRAPARTUM DEINFIBULATION DURING LABOR OR CHILD BIRTH

- The incision should be made at the height of uterine contraction to minimize pain and after the administration of a local anesthesia
- Suture of the deinfibulated labia can be delayed after child birth

POSTOPERATIVE CARE

- Explain to the woman that she is likely to have increased sensitivity/ discomfort for a while and she will have change in voiding patterns as a result of opening up the closed vulva (e.g quick voiding)
- Advise her to take more water for 3-4 days to make the urine diluted and minimizes the stinging sensation of the urine in the area.
- Sitz baths
- Advise her and her husband when to resume sexual intercourse. Typically, this will be after 4 to 6 weeks.

- Advise on the importance of personal hygiene, washing with plain water (no soap or detergent).
- Make a follow-up appointment to monitor healing progress

Craniotomy

DEFINITION:

Craniotomy is a delivery procedure where the head of a dead fetus is perforated to evacuate the brain tissue; and decrease its size to effect extraction of the fetus.

INDICATION

- Dead fetus with obstructed labor and with vertex, face, interlocked head of twins and arrested after coming head.

PREREQUISITES:

- Dead fetus
- Fully dilated cervix
- Descent of 2/5 or below in cephalic presentation or entrapped after coming of head
- Ruptured membranes
- Intact uterus and no imminent uterine rupture
- Experienced operator
- Back up operative facilities

PREPARATIONS:

- Put up an IV drip; hydrate and resuscitate the woman as required;
- Determine hemoglobin, blood group, cross match
- Give broad spectrum antibiotics
- Counsel and obtain consent
- Give pain medication as required (pethidine, local, spinal or general anesthesia).
- Alert the OR staff. (It is preferred to perform the procedure in the OR.)
- Put patient in lithotomy position
- Clean and drape the vulva and perineum
- Catheterize the bladder

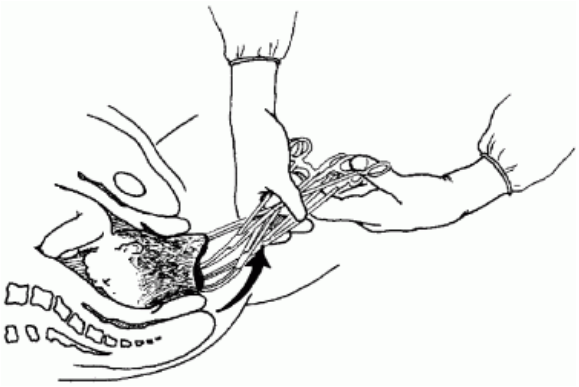
PROCEDURE:

Skull perforation

- Make a cross-shaped incision through the skin of the head up to the skull bone.
- Push a perforator or scissors and enter into the cranium.

- Sites of perforation:
    - *Vertex:* On the parietal bone either side of the sagital suture.
    - *Face:* Through the orbit or hard palate
    - *Brow:* Through the frontal bone.
    - *After coming head:* Through foramen magnum.

Cruciate incision on the scalp



Extraction by scalp traction

Fig: Craniotomy

Scalp Traction

- Introduce the perforator, with closed blade, under palmar aspect of fingers protecting anterior vaginal wall and bladder at predetermined site. Avoid sudden sliding of your instrument over the skull and getting into maternal tissue.
- Open the perforator or the scissors and rotate it to disrupt the brain tissue; the brain tissue should now be coming out from the hole.
- Put 3-4 strong vulsellum forceps, kochers or heavy-toothed forceps on the skin and bones and pull on the forceps to achieve vaginal delivery.
- Protect the vagina by avoiding sharp scalp bone edges tearing the vaginal wall by your finger or by removing the offending bones.
- As the head descends, pressure from the bony pelvis will cause the skull to collapse, decreasing the cranial diameter.

POST PROCEDURE CARE

- Leave a self-retaining catheter in place until it is confirmed that there is no bladder injury.
- Ensure adequate fluid intake and urinary output.
- Provide emotional and psychological support

COMPLICATION

- Tear or laceration to the uterus, cervix, vagina or vulva

Surgical Replacement of Uterine Inversion

INTRODUCTION

Uterine inversion occurs when the uterine fundus collapses into the endometrial cavity, turning the uterus partially or completely inside out.
It is a rare complication of vaginal or cesarean delivery, but when it occurs, it is a life-threatening obstetric emergency.

CLINICAL FEATURES

Puerperal uterine inversion follows delivery. Signs and symptoms include one or more of the following:

- Mild to severe vaginal bleeding
- Mild to severe lower abdominal pain
- A smooth, round mass protruding from the cervix or vagina
- Urinary retention
- On vaginal examination, the inverted fundus fills the vagina or in incomplete uterine inversion, mass (ie, fundus) can be palpated through the dilated cervix.
- On transabdominal palpation, the uterine fundus is absent from its expected periumbilical position or a cup-like defect (fundal notch) may be palpated in the area of the normally globular fundus.

INDICATION FOR SURGICAL REPLACEMENT

- Failed manually replacement of the inverted uterus

SURGICAL TECHNIQUES

Huntington Procedure

- Locate the cup formed by the inversion
- Place a clamp, such as an Allis or Babcock clamp, on each round ligament entering the cup, approximately 2 cm deep in the cup. Clamp the myometrium if the round ligaments cannot be identified.
- Gently pull on the clamps to exert upward traction on the inverted fundus.

- Repeatedly clamp in 2 cm increments along the ligament and exert traction until the inversion is corrected.
- If available, a second operator can place a hand in the vagina and apply upward pressure on the fundus to facilitate the procedure, or they can pull one of the clamps while the first operator pulls the other clamp.

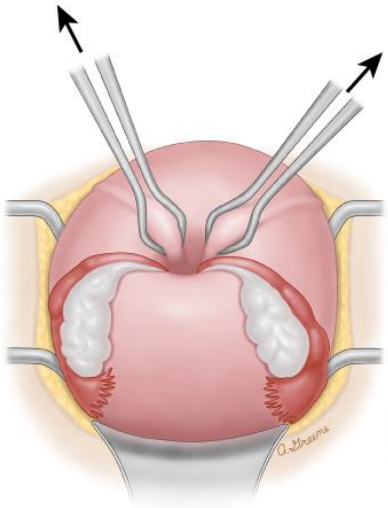


Fig: Huntington Procedure

Haultain Procedure

- Make an incision (approximately 1.5 inches in length) in the posterior surface of the uterus to transect the constriction ring and thus increase the size of the previously constricted area. Posterior incision is preferred to an anterior incision to reduce the risk of accidental cystotomy.
- Manual reduction is performed through the vagina or by placing a finger abdominally through the myometrial incision to below the fundus and then exerting pressure on the fundus to reduce the inversion.
- The incision is repaired when the uterus has been returned to a normal position.

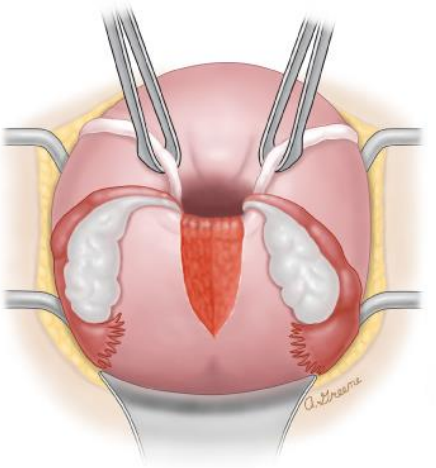


Fig: Haultain Procedure

POSTPROCEDURE CARE

- **Hold the uterus in place**: After the uterus has been replaced, the fundus should be held in place until the uterus is firm and its position is stable.
- **Administer uterotonic drugs**: An oxytocin infusion (20 to 40 units in 1 liter of crystalloid infused at 150 to 200 mL per hour)
- **Antibiotic prophylaxis**

DRAINAGE OF VULVAL AND PARAVAGINAL HEMATOMA

INTRODUCTION

- ***Defintion:*** evacuation of collection of blood/hematoma in the vulva or vagina
- Vulvar hematoma is the most common type of puerperal genital hematomas (paravaginal, vulvovaginal, or subperitoneal hematomas). Perineal pain is the hallmark symptom that should prompt clinicians to examine the patient for a suspected puerperal genital hematoma.
- Early recognition is paramount in reducing the associated morbidity, improving patient outcomes, and shortening the length of hospital stay

INDICATION FOR HEMATOMA DRAINAGE

- Large (>10 cm in diameter)
- progressively enlarging hematomas causing intense pain and distress to the patient
- hemodynamic instability
- urological or neurological signs and symptoms.

PREOPERATIVE PREPARATION

- Place urinary catheter (particularly if the patient experiences difficulty urinating)
- Adequate analgesia/ anesthesia

INVESTIGATIONS

- CBC
- Blood group and RH
- Coagulation screening
- Ultrasound
- Cross matched blood

SURGICAL TECHNIQUES

Vulvar hematoma

- A wide linear incision is made through the skin
- Hematoma is evacuated

- Once the hematoma is evacuated, the dead space should be closed in layers with absorbable suture and a sterile pressure dressing applied. Typically, the bleeding is due to multiple small vessels; hence, vessel ligation is not possible.
- A transurethral Foley catheter should be placed until significant tissue edema subsides.

Vaginal hematoma

- Unlike vulvar hematomas, the incision of a vaginal hematoma does not require closing; rather a vaginal pack or tamponade device should be placed on the raw edges.

POSTOPERATIVE CARE

- Continued monitoring of the patient's vital signs
- Early mobilization
- Wound care
- Postoperative analgesics
- Antibiotics (if indicated)

COMPLICATIONS

- Necrosis is a complication that will necessitate surgical debridement.
- Infection
- Recurrence can recur after surgery

Cesarean Section (CS)

INTRODUCTION

Definition: Cesarean section (delivery) is the delivery of the fetus (es), placenta and membranes through an incision on the abdominal wall (laparotomy) and uterine wall (hysterotomy) at or after 28 weeks of gestation.

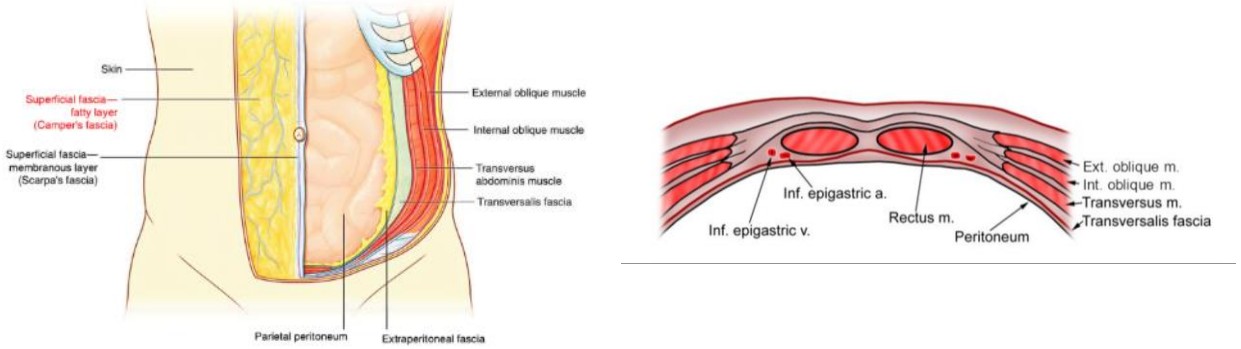
Types of cesarean section: Cesarean operations are classified according to the orientation (transverse or vertical) and the site of placement (lower segment or upper segment) of the uterine incision. Cesarean section is performed electively or as an emergency procedure.

EPIDEMIOLOGY

- Cesarean section is the most commonly performed major abdominal surgery. The Ethiopian national cesarean section rate is about 2%, but the rate varies widely among administrative regions, suggesting unequal access.
- WHO Recommends CS Rate of 5-15%.

ANATOMY AND PHYSIOLOGY

During cesarean delivery, stepwise incision is made through the skin; superficial fascia - fatty layer (Campers fascia); superficial fascia - membranous layer (Scarpas fascia); rectus sheath (Below level of arcuate line there is no posterior rectus sheath); rectus muscles; parietal peritoneum; visceral peritoneum; uterus and amniotic sac to extract the fetus. See figure below



Abdominal wall *Below arcuate line*

Fig. Anterior abdominal wall

INDICATIONS FOR CESAREAN SECTION

Cesarean section is performed when safe vaginal delivery either is not feasible (absolute) or would impose undue risks to the mother or/ and fetus (relative). The common indications include:

- malpresentations (preterm breech, non-frank breech, shoulder, brow, cord prolapse/ presentation, etc)
- non-reassuring fetal status (non-reassuring fetal heart rate, thick meconium, intrauterine growth restriction, non-reassuring biophysical profile)
- labor abnormalities (Prolonged labor, fetopelvic disproportion, cephalopelvic disproportion, obstructed labor)
- prior uterine scar
- infections (including HIV)
- antepartum hemorrhage (placenta previa, with hemodynamic instability)
- failed induction and
- underlying contraindication for induction of labor or vaginal delivery

PREOPERATIVE PREPARATION/ PLAN

- Revise the clinical history including anesthetic risk assessment, drug history
- Ensure for the presence of appropriate indication for the procedure
- The anesthesia for cesarean section should be selected with care (see chapter --)
- Plan the procedure ahead of time based on the individual's clinical situation: skin incision type, uterine incision type, need of additional procedures (e.g., tubal ligation or cesarean-hysterectomy)
- Explain to the woman (and her relatives) about the procedure and obtain informed consent.
- ***Washing-*** In elective surgeries, patients are advised to shower or have a bath (or be assisted to shower) using soap, either the day before, or on the day of surgery.
- Feeding
    - Elective CS: NPO for 8 hours for regular meal and 2 hours for clear fluid (commonly done after mid-night for morning planned CS)
    - Emergency CS: Limit feeding to fluid diet in laboring women with increased risk of emergency CS (e.g., TOLAC, induction in non-reassuring biophysical score).

- Make sure the necessary personnel, equipment, drugs, and supplies are in place

INVESTIGATIONS:

- Hemoglobin/ Hematocrit
- Blood group (ABO) and Rh
- Cross matched blood (at least 2 units) for conditions that have high possibility of blood transfusion

PREOPERATIVE MANAGEMENT

- Secure IV line (16 or more-gauge cannula)
- Infusion of IV fluids (eg, lactated Ringer solution or saline with 5% dextrose)
- Placement of a Foley catheter
- Placement of an external fetal monitor and monitors for the patient's blood pressure, pulse, and oxygen saturation
- ***Preoperative antibiotic prophylaxis:*** 15 to 60 minutes prior to skin incision give penicillin (eg. ampicillin 2g Iv) or first-generation cephalosporins (eg. cephalexin, cefazolin)
- ***Positioning:*** Position the operation table by tilting the table to left or place a pillow under the woman's right lower back.
- ***Vaginal cleansing:*** Clean the vagina with povidone-iodine solution-soaked gauze held on sponge forceps/stick immediately before surgery. (clean high in the vagina, reaching the cervix, for 30 seconds).
- ***Skin preparation:***
    - Apply antiseptic solution (pre-mixed chlorhexidine-alcohol solution) on the incision and surrounding area. Povidone iodine-based antiseptic solutions can be used if alcohol-based solution is not available.
    - Prep incision site first; going back and forth for 30 seconds. Then, using a separate swab, gradually enlarge prep area, working away from incision site. Do not go back over the incision site.

SURGICAL TECHNIQUES

Step 1: Abdominal Incision

- ***Skin incision:*** Factors that influence the type of incision include the urgency of the delivery, placental disorders such as anterior complete placenta previa and placenta accreta, prior incision type, and the potential need to explore the upper abdomen for non-obstetric pathology and surgeon's experience. Recommended options of skin incisions are
    - Transverse skin incision, two fingers above the symphysis pubis (in Pfannenstiel-Kerr technique)
    - Straight transverse skin incision 3 cm below anterior superior iliac spines (in Joel-Cohen technique),
    - Midline sub umbilical incision

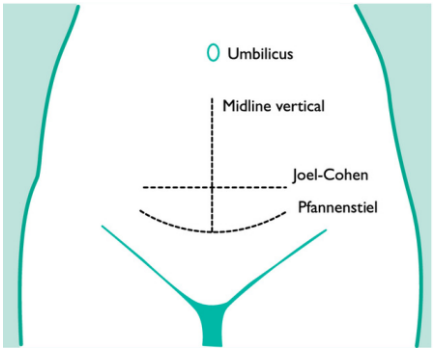


Fig. Types of Skin Incisions

- ***Subcutaneous tissue and rectus sheath:*** The subcutaneous tissue is incised medial, and extended manually. For secondary cesarean section delivery, sharp incision is recommended.
- ***Fascia:*** Make a small incision over the fascia with a scalpel and extend it bilaterally to the whole length of the incision with scissors. The underlying rectus muscle is separated from the fascia superiorly with blunt and sharp dissection. Non-dissection of the inferior rectus fascia is associated with decline of pre- and postsurgical hemoglobin levels and less pain.
- ***Muscle:*** The rectus muscles and pyramidalis are separated in the midline by sharp incision and then with blunt dissection. Clamp and ligate any blood vessels encountered.
- ***Peritoneum:*** Elevate the peritoneum at the upper edge of the incision by holding it with two artery forceps about 2 cm apart. Check for entrapment of omentum or bowel and

incise between the two-artery forceps to open the peritoneal cavity. Check if there is adhesion of the peritoneum or dense infiltration by inserting a finger and palpating up and down the peritoneal opening. Extend the peritoneal opening with scissors up wards up to the upper border of the incision and downward up to the reflection of the bladder. For primary cesarean delivery, the peritoneal cavity can be entered using fingers and extended manually.

Step 2: Uterine Incision

- There are three standard uterine incisions that can be performed for delivery of the fetus: low transverse, low vertical, and classical.

A. lower segment transverse cesarean section (Monroe-Kerr)

- The most commonly used type of caesarean section.
- First, correct the symmetry of the uterus if dextro-rotated
- Place moist packs in the lateral gutters on each side of the uterus to prevent blood and fluid from draining into the peritoneal cavity particularly in pregnancies complicated by chorioamnionitis.
- *Bladder flap**:*** development of a bladder flap is not always necessary, especially in the nonlabored patient. In creating a bladder flap,
    - Dissect the bladder free of the lower uterine segment.
    - Grasp the loose uterovesical peritoneum with forceps, and incise it with scissors.
    - The incision is extended bilaterally in an upward curvilinear fashion.
    - The lower flap is grasped gently, and the bladder is separated from the lower uterus with blunt and sharp dissection. A bladder retractor is placed to both displace and protect the bladder inferiorly and to provide exposure for the lower uterine segment.
- Make a transverse incision on the noncontractile portion of lower segment of the uterus. The incision is made 1-2 cm above the original upper margin of the bladder with a scalpel.
- Extend the incision bluntly (“smile”) or cranial-caudal. Cranial-caudal extension results in decreased rate of vascular injury and blood loss.
- Give special attention for those with prolonged labor and deep, impacted fetal head.
- When additional exposure to the uterine cavity is required to deliver the fetus, the low-transverse incision can be extended laterally and cephalad to increase the length of the incision without endangering the uterine arteries. This is called J-extension of the low-

transverse incision. Another option in this situation is to use an inverted T-extension in the midline. (J-extension is preferred over inverted T-extension)

B. ***low-vertical incision:***
    - is made through the noncontractile lower uterine segment in a vertical fashion

C. ***Classical incision***
    - incision made through the upper contractile portion of the myometrium.

Step 3 Delivery of fetus:

- Rupture the amniotic membrane if encountered.
- Insinuate fingers between the symphysis pubis and the fetal head until the posterior surface is reached.
- Lift the fetal head carefully anteriorly and, as necessary, superiorly to bring it from beneath the symphysis to the level of the uterine incision rather than bringing the incision down to the head.
- As the fetal head is lifted through the incision, pressure is applied by the assistant to the uterine fundus through the abdominal wall to help expel the fetus.
- ***Delivery of the impacted fetal head:*** The impacted fetal head can be delivered either through
- *pushing* the head up from the vagina and elevating it up through the incision or
- by *pulling* it up as if it were a breech delivery (Reverse breech delivery)

Step 4 Immediately after delivery of the baby

- Dry the baby, assess breathing
- Delayed cord clamping in vigorous newborns and controlled hemostasis: 60 seconds (for term babies) or 30 seconds (for preterm babies).
- ***Uterotonic administration:*** oxytocin infusion 10-40 IU in 1L of crystalloid over 4 – 8 hours
- ***Placental delivery:*** spontaneous delivery of the placenta using gentle continuous cord traction is associated with less blood loss and lower rate of endometritis than manual removal
- Manually mopping of the uterus with pack to confirm no membranes or cotyledon remain.
- There is insufficient evidence to recommend mechanical dilatation of the cervix at non-labor caesarean section for reducing postoperative morbidity.

Step 5 Uterine Closure

- Exteriorize the uterus out of the abdominal cavity and cover the fundus with moist pack. (Note that the need of uterine exteriorization for repair depends on the surgeon's preference and adhesion whether extensive is present.)
- Clamp briskly bleeding sites and the edges of the uterine incision with green armitage or ring forceps.
- Close the uterine incision with two layers of continuous inverting stitches with Chromic 1- or 2- catgut or polyglycolic (Vicryl 1.0). Replace the uterus back into the abdominal cavity.
- Ensure that hemostasis is well secured and the uterus is well contracted.
- Dry the abdominal cavity with gauze pack if there is grossly contaminated amniotic fluid or meconium.
- ***Closure of classical incisions:*** Closure of uterine incision involving the upper segment usually requires several layers using a heavy suture material. The first layer closes the inner half of the incision, with a second and possibly a third layer used to close the outer half and serosal edges.

Step 6 Abdominal wall Closure

- Peritoneal closure:
- Visceral peritoneum: only closed if significant venous ooze
- Parietal peritoneum: There is currently insufficient evidence of benefit to justify the additional time and use of suture material necessary for peritoneal closure. Based on surgeon's preference, the peritoneum can be loosely approximated.
- ***Fascial closure:*** Close the Fascia with running (continuous – not interrupted), unlocked suture. Run continuous suture to close rectus sheath with 1cm seperation between bites and bites should be 1cm from wound edge. During fascial closure, ensure peritoneum or other tissue is not included in suture. Use Vicryl no 1 or 2 or slowly absorbable sutures (PDS) to close the facia. Avoid non absorbable sutures.
- ***Subcutaneous closure:*** Approximate the subcutaneous layer with chromic 3-0 catgut
- ***Skin closure:*** Close the skin with continuous absorbable (e.g., Vicryl) subcuticular suture or interrupted silk as needed.
- Dress the wound, swab the vagina and ensure fundus is well contracted

Gauze, Instrument and Needle Counts

- Start and finish the procedure with a count of all instruments, sharps and sponges.

- Perform the count before closure of abdomen and after closure of skin
- Document in record that counts were correct.

MAJOR COMPLICATIONS

Immediate complications

- Intraoperative damage to organs such as the bladder or ureters
- Anesthetic complications including aspiration pneumonia
- Hemorrhage
- Infection
- Thromboembolism
- Maternal mortality is greater after caesarean than vaginal delivery
- Transient tachypnoea of the newborn is more common after caesarean section.

Long-term risks include an increased risk of

- Uterine rupture in subsequent pregnancies
- Limitation of number of children
- Placenta previa
- Placental abruption
- Placenta accreta

POSTOPERATIVE FOLLOW-UP

Immediate:

- Check and record vital signs on arrival to the ward and every 15 min until she is fully awake and stabilized
- Monitor urine output
- Check for vaginal bleeding and uterine tone

Late:

- Check and record vital signs and urine output every 4-6 hours.
- Start sips of fluid after ascertaining that she conscious and bowel sounds are active
- Discontinue IV fluids once started fluid diet unless there is other IV medication
- Provide analgesics as required
- Ambulate early

- Look for evidences of PPH, pulmonary infection, UTI, and wound infection
- Initiate breast-feeding and skin-to skin contact with the baby as soon as the mother is awake
- Open the wound site and remove stitches on the sixth day (can be done at the OPD if the woman is discharged earlier)
- Discharge when vital signs are within normal range, mother has started regular diet

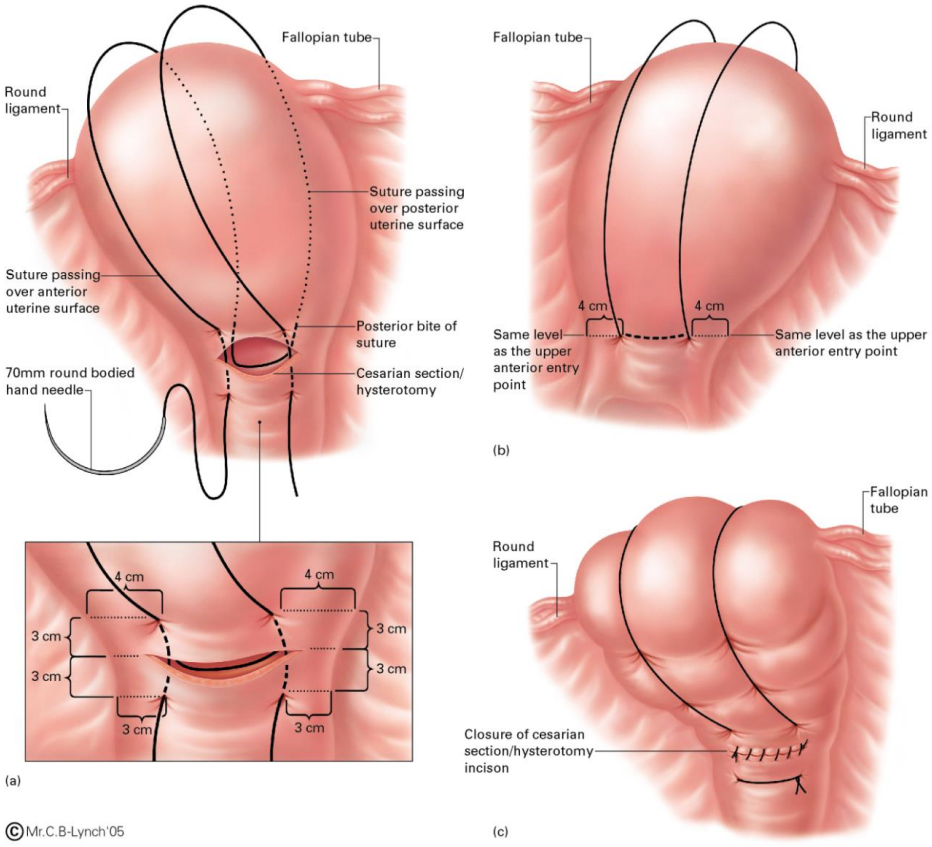
Application of B-Lynch compression suture

INDICATIONS

- PPH following Uterine atony and if to avoiding peripartum hysterectomy

OPERATIVE TECHNIQUES

- Exteriorize the uterus
- Bi-manual compression to test for potential success
- Transverse lower segment incision is made
- Uterine cavity checked, explored, and evacuated
- Using large needle with a 90-cm long stitch (monocryl No. 1 or Catgut suture)
- Apply suture correctly with even tension (no shouldering)
- Allow free drainage of blood, debris, and inflammatory material.
- Check bleeding control vaginally, using swabs and instruments



Repair of ruptured uterus

INTRODUCTION

Surgical options for management of uterine rupture can range from repair of uterine tear with preservation of fertility to total abdominal hysterectomy. Obstructed labor and previous cesarean section scar are the most common risk factors for uterine rupture.

DEFINITIONS

- ***Repair of Uterine Rupture:*** repair of disruption of the uterine wall (above the cervico uterine junction) during pregnancy or childbirth.

CLASSIFICATION

- repair of uterine tear with preservation of fertility
- repair of uterine tear with bilateral tubal ligation

INDICATION

Repair of uterine tear with preservation of fertility:

- If preservation of fertility is desired.
- Performed for recent tear, not too large, with accessible and clean (little or no infection) edges.

Repair of uterine tear with bilateral tubal ligation:

- For less experienced surgeon to do hysterectomy or
- If the patient is in critical condition

INVESTIGATIONS

- Determine hematocrit
- Blood group and RH
- Cross-matched blood

PREOPERATION MANAGEMENT

- Secure good venous access bilaterally
- Resuscitation with IV fluids and blood products
- Laparotomy should not be delayed till patient is resuscitated out of shock.
- Give triple antibiotics to cover both aerobes and anaerobes

INTRAOPERATIVE MANAGEMENT

Abdominal incision:

Abdominal cavity is entered through midline vertical sub umbilical incision.

Exloration:

- Examine the abdomen and the uterus for site of rupture and remove clots
- Place bladder retractor and/or abdominal retractors.
- Deliver the baby and placenta.
- Infuse oxytocin if uterus is atonic
- Examine both the front and the back of the uterus by lifting the uterus out of the pelvis
- Hold the bleeding edges of the uterus with Green Armytage clamps (or ring forceps).

- Separate the bladder from the lower uterine segment by sharp or blunt dissection. If the bladder is scarred to the uterus, use fine scissors.

Surgical technique

- Depends upon extent and site of injury

1. Rupture through cervix and vagina

- If the uterus is torn through the cervix and vagina, mobilize the bladder at least 2 cm below the tear.
- If possible, place a suture 1 cm below the upper end of the cervical tear and keep traction on the suture to bring the lower end of the tear into view as the repair continues.

2. Rupture laterally through uterine artery

- If the rupture extends laterally to damage one or both uterine arteries, ligate the injured artery.
- Identify the arteries and ureter prior to ligating the uterine vessels

3. Rupture with broad ligament hematoma

- If the rupture has created a broad ligament hematoma, open the anterior leaf of the broad ligament through the round ligament (after clamping, cutting and ligation)
- Drain off the hematoma manually, if necessary.
- Inspect the area carefully for injury to the uterine artery or its branches. Ligate any bleeding vessels

4. Repairing the uterine tear

- Repair the tear with a continuous locking stitch of vicryl (1.0) or chromic catgut suture.
- If bleeding is not controlled place a second layer of suture
- If the rupture is through a previous classical or vertical incision, close with three layers.
- Ensure that the ureter is identified and exposed to avoid including it in a stitch.
- Control bleeding by clamping with long artery forceps and ligating. If the bleeding points are deep, use figure-of-eight sutures.

5. Repair of bladder injury

- Identify the extent of the injury by grasping each edge of the tear with babcock or allis forceps and gently stretching.
- Determine if the injury is close to the bladder trigone (ureters and urethra).

- Dissect the bladder off the lower uterine segment with fine scissors or with a sponge on a clamp.
- Free a 2 cm circle of bladder tissue around the tear (2 cm needle bite)
- Repair the tear in two layers with continuous 3-0 chromic catgut (or polyglycolic) sutureSuture the bladder mucosa (thin inner layer) and bladder muscle (outer layer);
    - Invert (fold) the outer layer over the first layer of suture and place another layer of suture;
    - Ensure that sutures do not enter the trigone area.
- Test the repair for leaks
    - Fill the bladder with sterile saline or water through the catheter;
    - If leaks are present, remove the suture, repair and test again.
- If it is not certain that the repair is well away from the ureters and urethra, complete the repair and refer the woman to a higher-level facility for an intravenous pyelogram.
- Keep the bladder catheter in place for at least 7 days and until urine is clear. Continue IV fluids to ensure flushing of the bladder

Abdominal Closure

- Ensure that there is no bleeding. Remove clots using a sponge.
- Close the abdomen layer by layer

POST-PROCEDURE CARE

- If there are signs of infection or the woman currently has fever, give a combination of antibiotics until she is fever-free for 48 hours
- Give appropriate analgesic drugs.
- If tubal ligation was not performed, offer family planning. If the woman wishes to have more children, advise her to have elective caesarean section for future pregnancies.

Uterine Artery and Utero-Ovarian Ligation

INTRODUCTION

Definition: bilateral uterine artery occlusion to control bleeding.

INDICATIONS

- Hemorrhage refractory to classical conservative treatment for postpartum bleeding after vaginal or cesarean section delivery.

SURGICAL TECHNIQUES

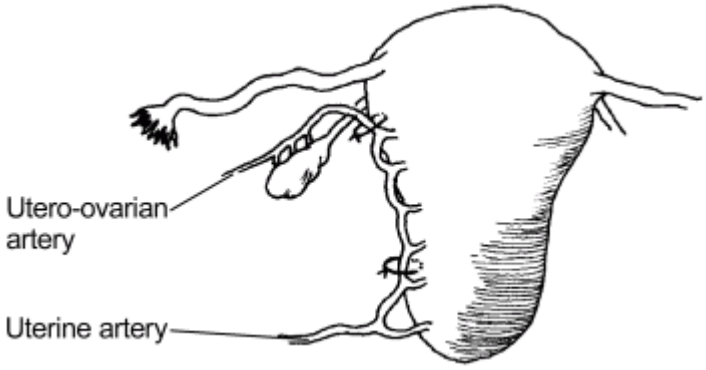
Uterine Artery Ligation

- Place a bladder retractor over the pubic bone and place self-retaining abdominal retractors.
- Pull on the uterus to expose the lower part of the broad ligament.
- Feel for pulsations of the uterine artery near the junction of the uterus and cervix.
- Using 0 chromic catgut (or polyglycolic) suture on a large needle, pass the needle around the artery and through 2–3 cm of myometrium (uterine muscle) at the level where a transverse lower uterine segment incision would be made.
- Tie the suture securely.
- Place the sutures as close to the uterus as possible, as the ureter is generally only 1 cm lateral to the uterine artery.
- Repeat on the other side.
- If the artery has been torn, clamp and tie the bleeding ends.

Utero-Ovarian Artery Ligation

- Ligate the utero-ovarian artery just below the point where the ovarian suspensory ligament joins the uterus.
- Repeat on the other side.
- Observe for continued bleeding or formation of hematoma.

Fig: Sites for ligating uterine and utero-ovarian arteries



Close the abdomen:

- Ensure that there is no bleeding. Remove clots.
- Examine carefully for injuries to the bladder and close the abdomen layer by layer

POST-PROCEDURE CARE

- If there are signs of infection or the woman currently has fever, give a combination of antibiotics until she is fever-free for 48 hours
- Give appropriate analgesic drugs

Abdominal Hysterectomy

INTRODUCTION

Definitions:

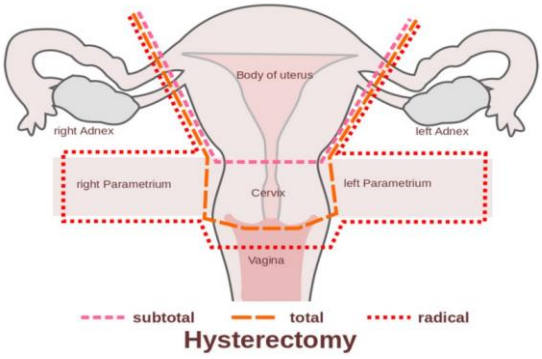
Hysterectomy is the surgical removal of the uterus.

- ***Peripartum hysterectomy:*** hysterectomy performed at the time, or within 24 hours, of delivery.
- ***Cesarean hysterectomy:*** removal of the uterus at the time of cesarean delivery

Classification:

Hysterectomy can be classified based on the amount of tissue removed:

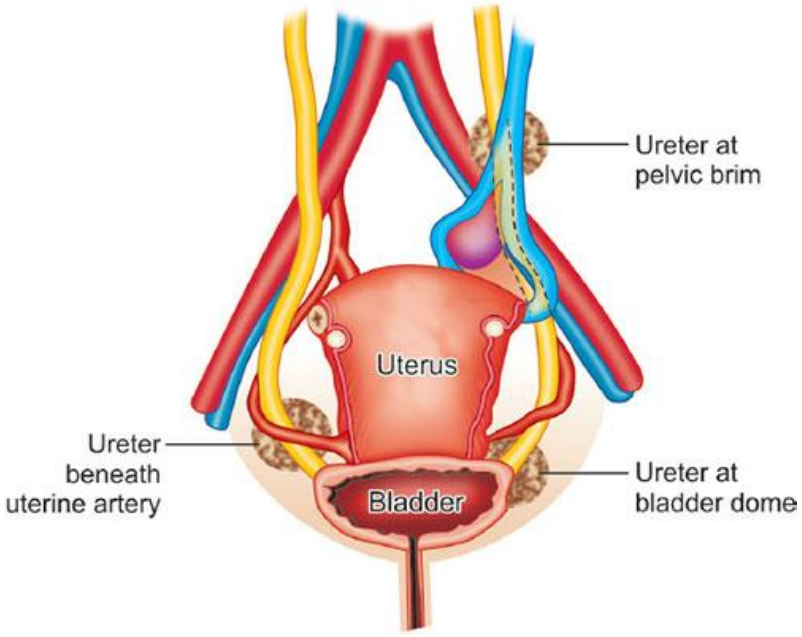
- *Total hysterectomy:* removal of the uterus and cervix.
- *Sub-total hysterectomy:* removal of the body of the uterus only, leaving the cervix behind.
- *Radical hysterectomy:* removal of the uterus and cervix, the parametrium, a vaginal cuff and part of or the whole of the fallopian tubes. (see chapter --)



ANATOMY AND PHYSIOLOGY

- The anatomical course of the ureters is of surgical importance, as they travel close to other structures in the pelvis.
- The most common site of operative injuries to the ureter during routine abdominal hysterectomy or adnexectomy is at the pelvic brim, where the ureters lie beneath the insertion of the infundibulo-pelvic ligament.

- Other common locations are over the iliac arteries**,** within the cardinal ligament at the level of the internal cervical os where the uterine artery crosses the ureter and at the anterolateral fornix of the vagina as the ureter enters the bladder**.**



INDICATIONS

- Peripartum events: intractable postpartum hemorrhage, morbid adherence of placenta, uterine rupture not amenable to repair
- Benign and malignant uterine masses, intractable abnormal uterine bleeding, etc

INVESTIGATIONS

- Complete blood count
- Blood group and RH
- Cross matched blood (at least two units)
- Other tests based on indication (e.g coagulation studies)

PREOPERATIVE PREPARATION

Venous access

- Two sites of peripheral intravenous access

Blood product availability

- Blood products including packed RBCs, fresh frozen plasma, and platelets should be immediately available particularly for peripartum hysterectomy.

SURGICAL TECHNIQUES

STEP 1: Opening Abdomen and Exploration

- Positioning: Patient is laid in supine position and urethral catheter is inserted for continuous bladder drainage.
- Longitudinal or transverse incision is made over the skin, then the fascia, and the peritoneum.
- The intestines are softly put upward and maintained with large gauze/sponge, and an appropriate operative field is obtained by the self-retaining retractor. (During peripartum hysterectomy, placement of a self-retaining retractor is not necessary.)
- Examine the uterus, adnexae, and the surrounding organs, and check whether unexpected abnormalities and/or adhesions exist or not.
- A pair of long and straight Kocher clamps are placed between the uterus and the adnexa to provide an easy way to manipulate the uterus and for satisfactory exposure. The tip of clamp should be at the avascular and transparent space of anterior and posterior of broad ligaments, and should not reach to the uterine vessels below.
- Elevating the uterus out of the pelvis, the anatomy is reevaluated and any adhesions to adjacent bowel or omentum are freed.

Step 2: Round Ligament and Peritoneum

- The round ligament is clamped, cut and ligated (using either 0- or #1 vicryl), opening the retroperitoneal space. When cutting the ligaments or vessels, it is important to put the scissors vertically to the ligament.
- Identify the transitional and freely movable area between the uterine and bladder serosa by lifting the broad ligament of vesicouterine pouch.

- Incise the anterior leaf of broad ligament from the round ligament to vesicouterine fossa using scissors. (Incision line is concave-shaped)
- Open the infundibulo pelvic ligament 1 cm below and parallel to infundibulo pelvic ligament
- Palpate the posterior leaf of broad ligament using fingers, and confirm the ureter running 2 to 4 cm apart from the ovarian artery and vein.

Step 3: Infundibulopelvic Ligament and Adnexa

- If there are indications to perform salpingo-oophorectomy
- The posterior leaf of the broad ligament adjacent to the uterus is perforated just beneath the fallopian tubes, utero-ovarian ligaments, and ovarian vessels.
- The infundibulopelvic ligament (containing the ovarian artery and vein) is isolated and clamped with three heavy clamps (Heaney or curved Zeppelin clamps). Incise the tissue between the most medial and two lateral clamps, and then ligate the two pedicles in the clamps lateral to the uterus with 2-0 vicryl.
- If the ovaries are to be preserved, the utero-ovarian pedicle is clamped, divided, and double ligated.
- Note that during hysterectomy, removing both fallopian tubes while keeping the ovaries may help protect against ovarian cancer. In this case, mesosalpinx is clamped several times, cut, and ligated.
- Then, the posterior part of broad ligament is incised. Here, it is also important to determine the target endpoint of incision, that is the uterine origin of sacrouterine ligament.
- The operator should tract the peritoneum intensively and then attach the scissors almost vertically to the peritoneum, push slightly, and scrape down all of the connective tissues beneath the peritoneum.

Step 4: the opposite side

- All of the above procedures are done for the opposite-sided round ligament, broad ligament, and infundibulopelvic ligament or adnexa.

Step 5: Mobilization of Bladder

- Palpate the cervix from both anterior and posterior sides of uterus to confirm the position of the cervix and to assess the height of lower end of cervix or vaginal fornix.
- The bladder is then dissected free from the anterior wall of the lower uterine segment, mobilized downwards to the appropriate level of height, (1 cm below the vaginal

fornix).and retracted out of the operative field. If the bladder flap is unusually adherent, as it may be after previous hysterotomy incisions, careful sharp dissection may be necessary

- Start mobilizing the bladder at the midline of cervix, to prevent bleeding from the lateral-sided vesicouterine ligaments.
- The L-shaped retractor is placed at the detached portion, pushing the bladder downward
- Usually, mobilization of rectum from the uterus is not necessary, because the operator can directly approach the posterior wall of vagina through the cul-de-sac peritoneum.

Step 6: Cardinal Ligament

- The ascending branch of the uterine artery and veins are skeletonized. i.e., carefully dissect and remove the loose connective tissue on the uterine artery and vein.
- Special care is required to avoid injury to the ureters, which pass beneath the uterine arteries. To avoid the ureteral injury, it is very important, by the assistant, to keep the uterus in the traction upward and to push the bladder downward using retractor. (The ureter is palpated running along the posterior leaf of broad ligament, and is identified as it enters the cardinal ligament 1 to 3cm lateral from the cervix and 2 to 4 cm below the uterine artery.)
- Apply the first clamp at an angle of 45° for the upper half of the cervix, so that the tip of clamp reaching 1 cm below the height of internal os of the uterus. At clamping, it is desirable to have the clamp slide off the surface of the cervix, so that all of vessels be completely clamped.
- Palpate again the ureter, and confirm the distance between the tip of clamp and the ureter, that is usually 2 to 3 cm apart. Another upper clamp is then placed to prevent backflow bleeding from the uterus. Then, the upper half of ligament is cut with scissors.
- The cut-end of uterine artery is ligated.
- The remaining portion of the ligament on each side of the cervix is then clamped, as close to the cervix as possible, taking care not to include excessive tissue in each clamp.
- The tissue between the pair of clamps is incised and the distal pedicle suture ligated. These steps are repeated until the level of the lateral vaginal fornix is reached. In this way, the descending branches of the uterine vessels are clamped, cut, and ligated as the cervix is dissected from the cardinal ligaments.

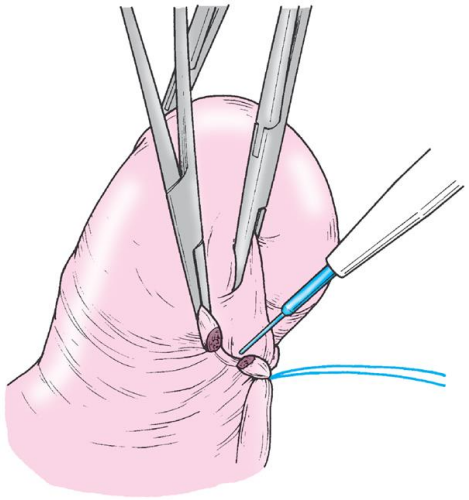
Step 7: Amputation and Closure of Vagina

- A large gauze is placed in the Douglas pouch, and the transitional area between the cervix and vagina is again palpated.

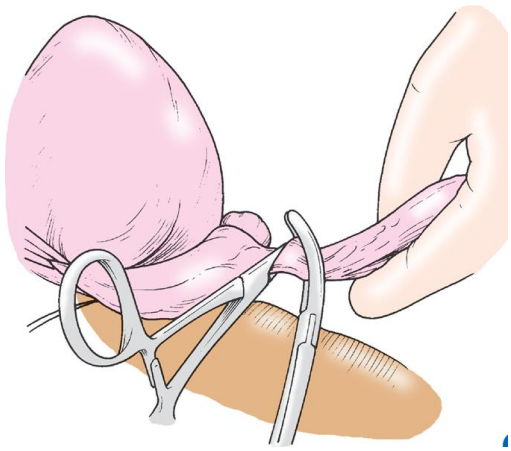
- Then, the sharp scalpel will be inserted vertically into the uppermost portion of the anterior wall of vagina
- With the uterus strongly elevated out of the pelvis, large right-angle clamps or curved clamps are placed across the lateral vaginal fornix, and the tissue is incised medially to the clamp with a knife.
- The cervix is inspected to ensure that it has been completely removed, and the vagina is then repaired using running-lock suture. Each of the angles of the lateral vaginal fornix is secured to the cardinal and uterosacral ligaments for support
- Examine carefully for bleeding. (Bilateral survey from the fallopian tube and ovarian ligament pedicles to the vaginal vault and bladder flap)
- Close the abdominal wall in layers.

Step 8: Closing Abdomen

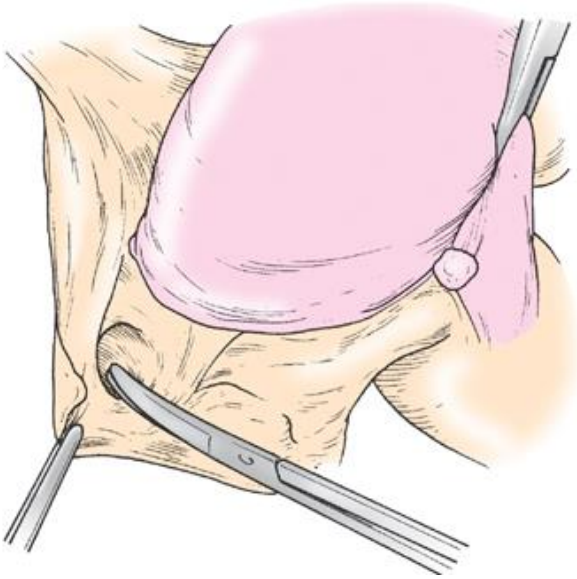
- Gauze, Instrument and Needle Counts
- Pelvic peritoneum is sutured and completely closed.
- The abdomen is closed with appropriate suture for the peritoneum, fascia, and skin.

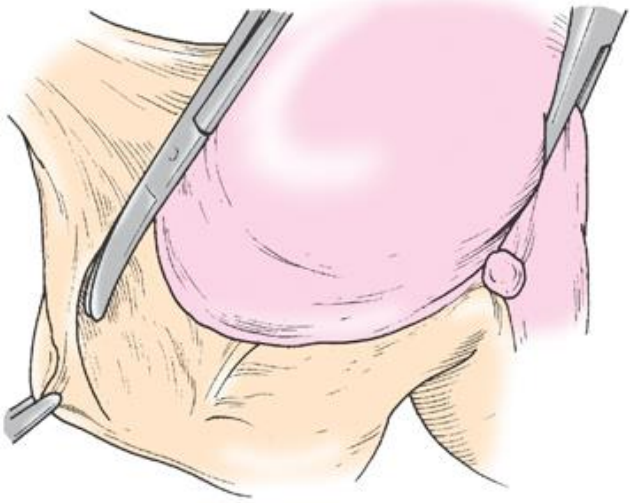


Ligate and cut the round ligament

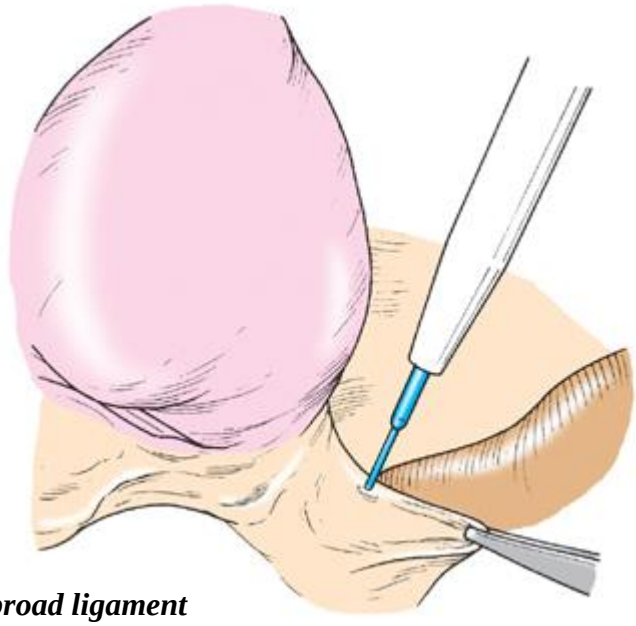


Clamp, cut, and ligate the or infundibulopelvic ligament

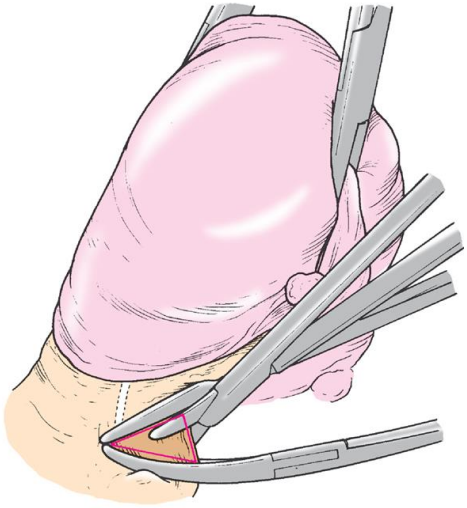




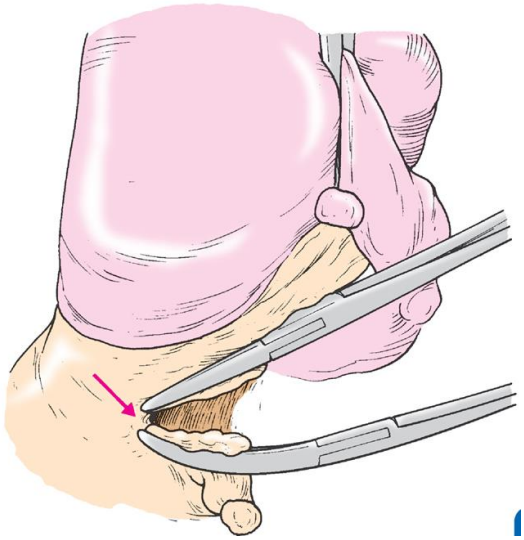
Mobilizing the bladder



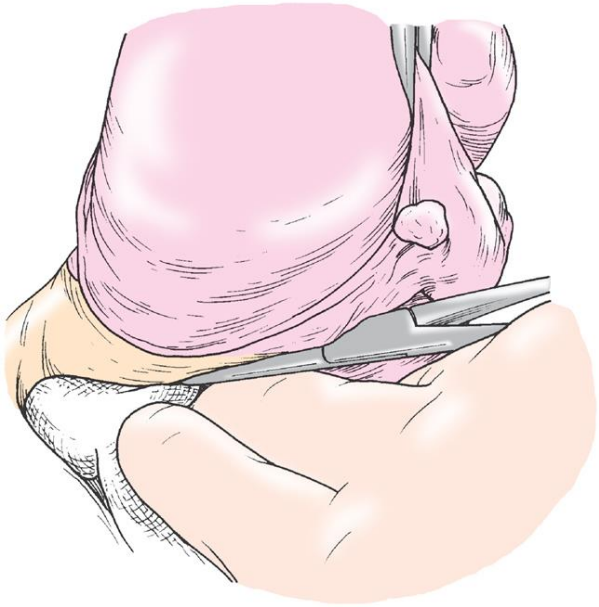
Cut the posterior broad ligament

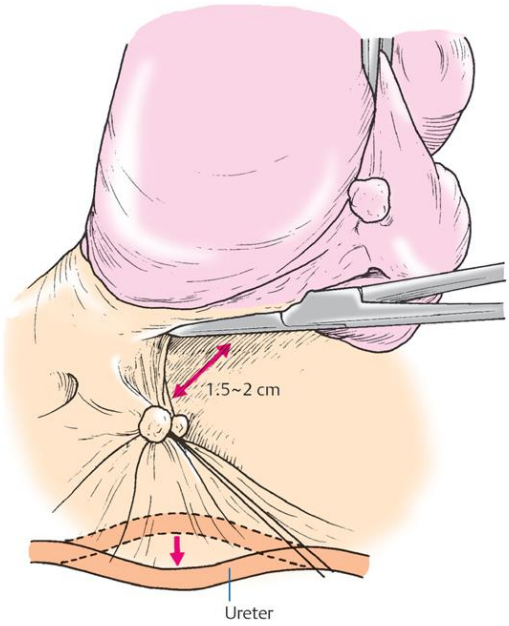


Cut the uterine artery and cardinal ligament

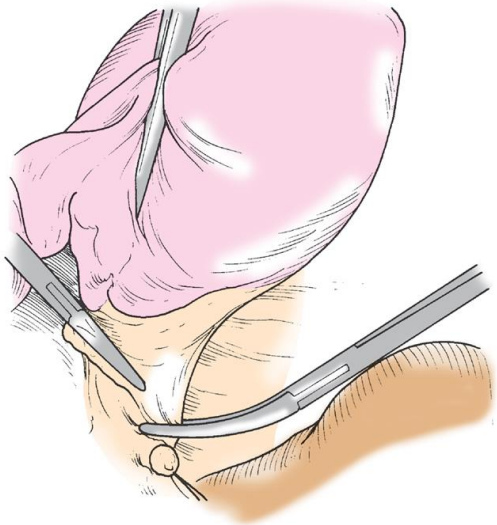


Cut the uterine artery and cardinal ligament

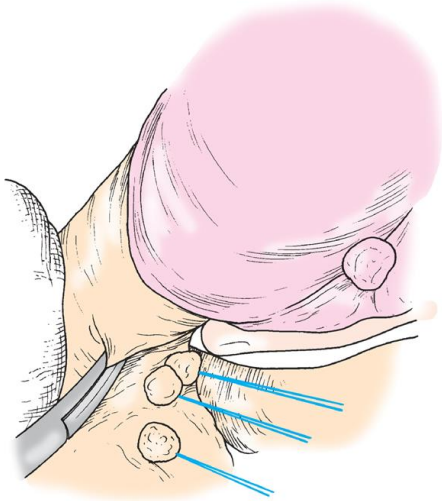




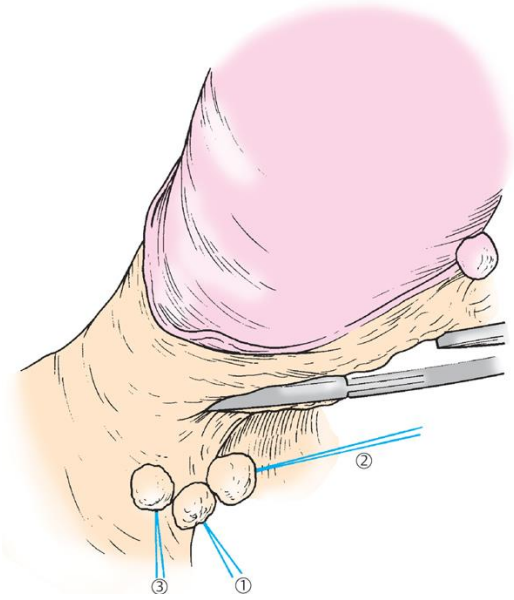
Push down the stump of the uterine artery and the cardinal ligament



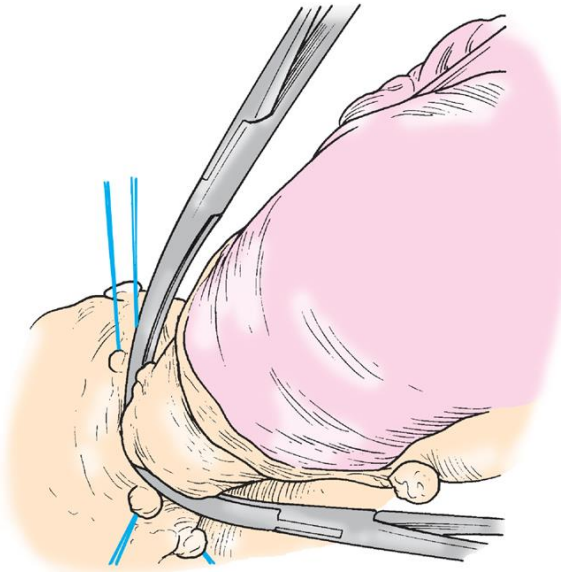
Clamp, cut and ligate the sacrouterine ligament and the cardinal ligament (second step of parametrial tissue cutting)



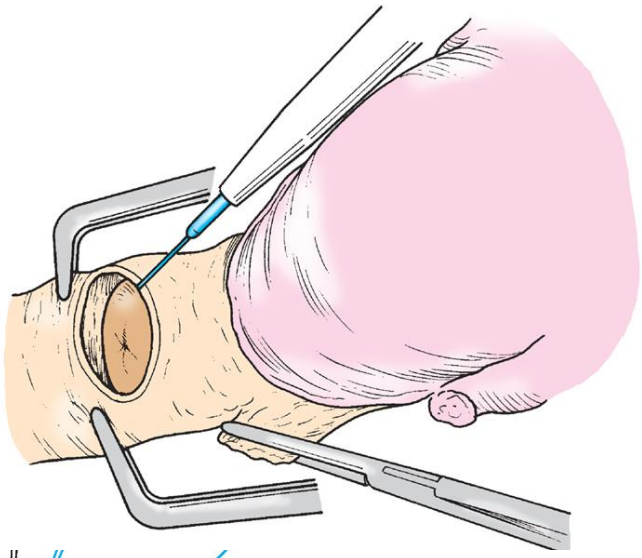
Clamp, cut, and ligate the vesicouterine ligament and of the cardinal ligament (third step of parametrial tissue cutting)



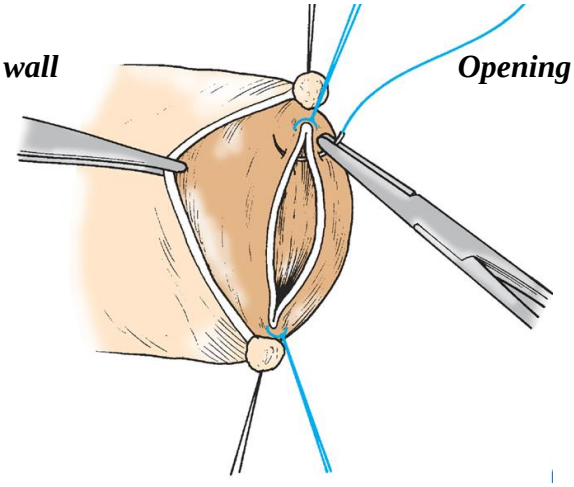
Condition after cutting the ligaments around



Clamp the vaginal wall



Opening the vagina



Closing the vaginal vault:

MAJOR COMPLICATIONS

- Blood loss
- Urinary tract damage
- Bowel injury

PROCEDURES FOR BENIGN GYNECOLOGY

PROCEDURES FOR BARTHOLIN'S CYST

DEFINITION:

The most common large cyst of the vulva which arises as a result of an obstruction of the duct.

ANATOMY & PHYSIOLOGY:

The Bartholin's glands are located bilaterally at the posterior portion of the vestibule, distal to the hymenal remnants and are secretory in function. Although not solely so, they are responsible for the natural lubrication of the vagina and vulva and are normally not palpable or visible on examination of the pelvis.

CLINICAL MANIFESTATION

- During the acute infection, an abscess often develops with symptoms of tenderness, swelling, and erythema.

INDICATION FOR SURGERY

- Large
- symptomatic
- infected
- concern about malignancy

TYPES OF PROCEDURES

- ***Incision and drainage***: for the first episode of an acute abscess or for large or symptomatic cysts to give immediate relief of symptoms.
- ***Marsupialization:*** If the cyst or abscess recurs
- ***Excision:*** A cyst that recurs despite repeated incision or marsupialization or one suspicious of malignancy should be excised. Excision should not be performed if there is active infection.

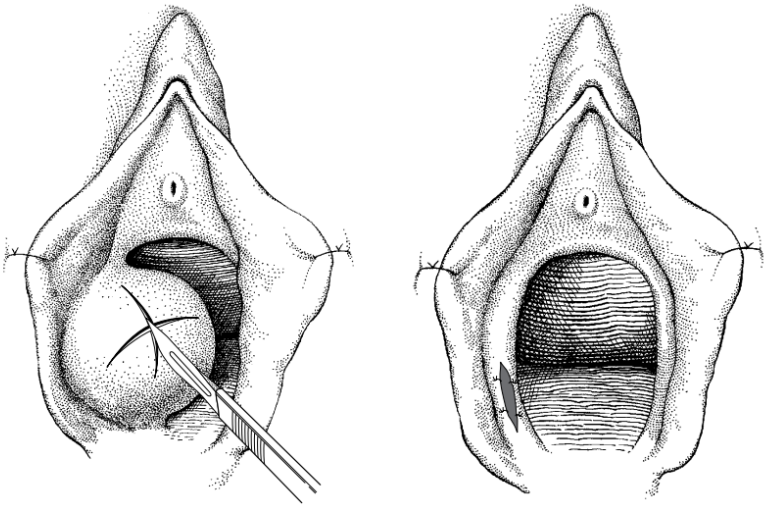
Surgical Techiniques of Incision and Drainage of Bartolyn's Cyst:

- A sterile field is prepared and the patient is placed preferably in a lithotomy position.

- Infiltrate 2-3 mL of lidocaine 1% subcutaneously under the mucosa of the labia minora
- An incision is made in the vestibular area through an area of fluctuation
- Make the incision within the hymenal ring, if possible.
- Express the contents of the sac manually
- Insert the tip of the Word catheter deep into the abscess cavity and use 2-4 mL of normal saline to inflate the balloon
- The catheter should stay in place for up to 4 weeks to allow epithelization of the tract.

Surgical Techiniques of Marsupilization:

- A 1–1.5cm cruciate incision is carried through into the cyst, releasing its contents. The four segments of skin and cyst wall formed by the incision are excised, leaving a circular opening.
- The cyst wall is sutured using interrupted stitches to the skin edge allowing free drainage of its secretions to the exterior.
- The new tract will slowly shrink over time and will epithelialize, forming a new duct orifice.

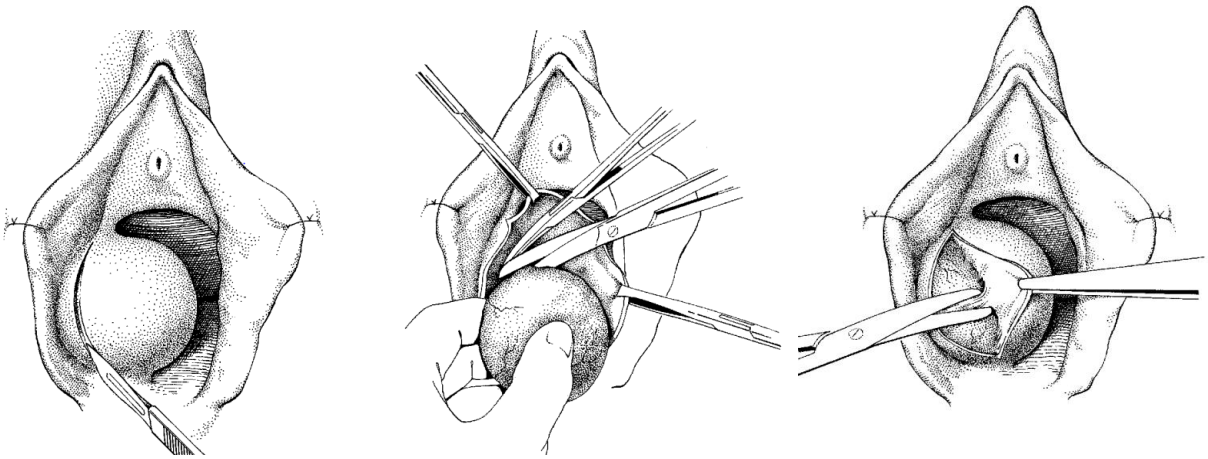


Cruciate incision over abscess *Wall of abscess sutured to skin*

Fig: Marsupilization

Surgical Techiniques of Bartolyn's Cyst Excision

- Make an along the long axis of the vestibular mucosa distal to the hymeneal ring over the cyst. To reveal the tense surface of the cyst.
- Enucleation of the cyst after developing the tissue plane around the cyst using a separating scissors (occasional strands of fascia may need to be cut).
- Tiny blood vessels can be diathermied or cut and tied.
- Obliteration of the cavity by completely closing the cavity with fine absorbable sutures
- The cut edges of the wound are apposed using interrupted sutures. A drain is not usually necessary but may be inserted and recorded if the procedure has been unusually bloody.



Incising Over the cyst *Removal of the cyst* *Enucleation of the cyst*

Fig: Excision of Bartholin's Cyst

Imperforate hymen

INTRODUCTION:

The hymen usually is perforated during embryonic life to establish a connection between the lumen of the vaginal canal and the vaginal vestibule, and it usually is torn early in the prepubertal years. If canalization fails and there are no perforations, the hymen is called imperforate.

Hymenal abnormalities are the most common cause of menstrual outflow obstruction, with an imperforate hymen occurring in 1/2000 girls.

CLINICAL MANIFESTATIONS:

- cyclical pain
- primary amenorrhoea
- obstructive symptoms of the bladder or bowel produced by the distended haematocolpos and haematometria.
- A bulging intact hymenal membrane, often bluish in colour due to the blood in the vagina.
- A pelvic abdominal mass may be palpable

An imperforate hymen, membrane protrusion witha dark-tinged posterior representing a hematocolpos

Extrusionof accumulated blood at the time of incision into the membrane.

Fig: Evaluation of Imperforate Hymen

OPERATIVE TECHINIQUE

Anesthesia:

- The operation can be performed as an outpatient or day case procedure under local anaesthesia or in in theatre under light general anaesthesia as deemed appropriate.

Steps of Procedure

- Bulging membrane is incised vertically and the retained blood allowed to drain.
- Once drainage has eased, another incision at right angles is made to form a cross
- The edges of the flaps are now excised and haemostasis obtained with simple interrupted sutures using a fine absorbable suture such as 4/0 Vicryl rapide.
- A local anaesthetic cream can be applied for postoperative analgesia

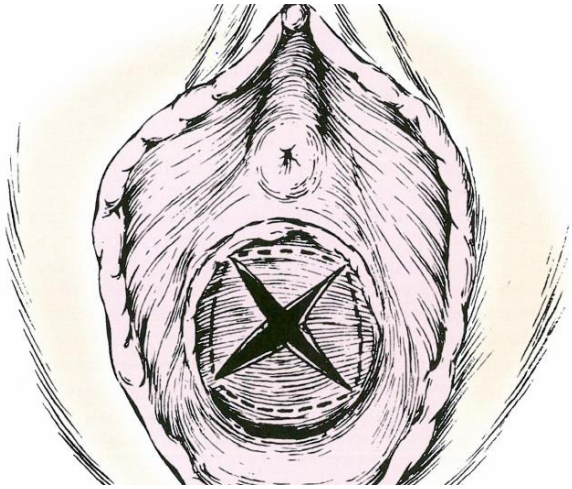


Fig: *Excision of imperforate hymen. Stellate incisions are made through the hymenal membrane at the 2-, 4-, 8-, and l O-o'c1ock positions. The individual quadrants are excised along the lateral wall of the vagina, avoiding excision of the vagina (inset). Margins of vaginal*

Postoperative care

- The vagina should be carefully drained with a suction probe.
- In patients in whom hematometra is present, all intrauterine instrumentation should be avoided , as there is signifcant risk of perforating the thin, overstretched uterine wall.
- Patients should be followed for 2 to 3 weeks to ensure adequate resolution of the hematometra.
- Rarely, secondary dilatation of the cervix maybe needed.
- Postoperatively, vulval hygiene is important and baths can be soothing.

Myomectomy

DEFINITION:

Myomectomy is a type of surgery used to remove uterine fibroids.

CLINICAL MANIFESTATIONS:

- Pelvic pain
- Heavy periods
- Irregular bleeding
- Frequent urination

INDICATIONS FOR MYOMECTOMY

- Severe menorrhagia in the setting of leiomyomas
- Protracted symptoms not responding to medical management
- Recurrent pregnancy loss in the presence of myomas
- Obstruction of pelvic organs (*i.e.* Ureters, bowel, bladder, and fallopian tubes) by myomas
- Rapidly enlarging myomas
- Infertility resulting from myomas, and
- Myomas of a large size

TYPES OF MYOMECTOMY:

- ***Abdominal myomectomy:*** for many or very large fibroids growing in uterine wall.
- ***Laparoscopic myomectomy:*** for smaller and fewer fibroids.
- ***Hysteroscopic myomectomy:*** *for* smaller & submucus fibroids

OPERATIVE TECHINIQUE: ABDOMINAL MYOMECTOMY

Skin Incision:

- Adequate exposure can be achieved through a Pfannenstiel incision or through a vertical midline incision. However, when the uterus is greater than 16 weeks' size and cannot be delivered through the horizontal incision, a vertical midline incision may be more appropriate.

- A broad ligament myoma may require dissection in the pelvic sidewall with subsequent unroofing of the ureter; this is done more easily through a vertical midline incision.

Hemostasis:

- **Mechanical:** Uterine and ovarian tourniquet- use of temporary tourniquets across the ovarian vessels and a further ligature around the ascending branches of the uterine vessels.
- **Vasopressin and other agents:** The injection of dilute vasopressin (20 units in 50–100ml of normal saline) into the stalk of a pedunculated fibroid or the bed of a subserosal fibroid will further decrease the blood loss during the myomectomy procedure.

Uterine Incision:

- Make a vertical incision on the anterior surface of the uterus.
- Identify the ‘false capsule’, the junction between the fibroid and normal myometrium
- With a combination of blunt and sharp dissection, the fibroid can be ‘shelled’ out.
- As much as possible, avoid posterior incision, avoid entrance into the endometrial cavity, minimize the length of the uterine incision and the number of uterine incisions.
- Occasionally, the surgeon must perform “transcavity enucleation” or use the “Boney hood method” to avoid a posterior incision. In this manner, posterior fibroids can be removed through an anterior uterine incision, which avoids the hazards of a posterior incision.

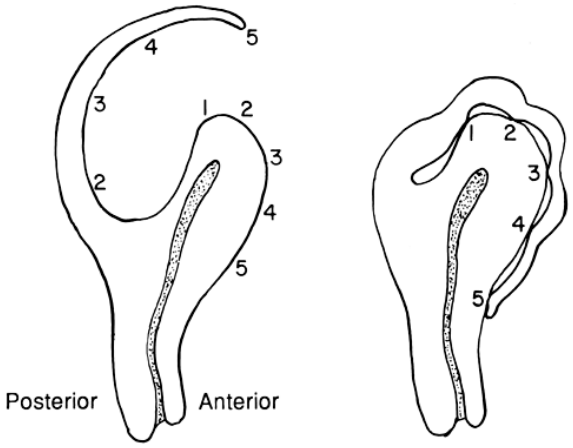


Fig: The Bonny hood method. *A fundal posterior incision is made to enucleate the myomas. After reapproximating the uterine muscle, the excess serosa is draped over the fundus and fixed to the anterior surface of the uterus with fine suture.*

Closing the resultant uterine defect

- Continuous suture or interrupted sutures can be used for tissue approximation and minimizing dead space.
- All myometrial layers should be adequately reapproximated
- Excess serosa is trimmed and the serosal defect repaired with a fine polyglycolic suture in a running “baseball” fashion. This allows a minimum of exposed suture material and decreases adhesion formation

COMPLICATIONS:

- Hemorrhage
- Infection
- required future pelvic surgery
- bowel obstruction
- adhesion formation
- damage to bowel, bladder, fallopian tube, and ureter
- Recurrent myomas

Operations for Resection of Uterine Septum

INTRODUCTION

- The uterine septum may be repaired with a laparotomy (Jones or modified Tompkins procedures) or with hysteroscopic techniques.
- The purpose of the operations is to restore the uterus to its normal configuration by removing the fibrous septum.

DIAGNOSIS

- **Direct visualization (gold standard):** Direct visualization of exterior and interior of the uterus using laparoscopy and hysteroscopy
- **Radiologic methods:** hysterosalpingography(HSG), sonohysterography or saline infusion sonography (SIS)

INDICATION FOR RESECTION

- To improve obstetric outcomes

HYSTEROSCOPIC SEPTAL RESECTION

- The hysteroscope is inserted into the endometrial cavity after dilation of the cervix.
- The LEEP device is inserted down the operative channel of the hysteroscope.
- The endometrial cavity is expanded with 5% dextrose and Ringer's solution.
- The LEEP electrocoagulation machine is set on a blend between cutting and coagulation current.
- The hysteroscope is advanced up the uterus along the septum.
- The LEEP device is aimed at the fundus, where the uterine septum and endometrial tissue join.
- The internal os of the Fallopian tubes must be identified, and the electrical incision must be kept medial to the os of the tubes.
- By progressively coagulating and cutting the base of the septum with the LEEP device, the entire septum is resected and removed.

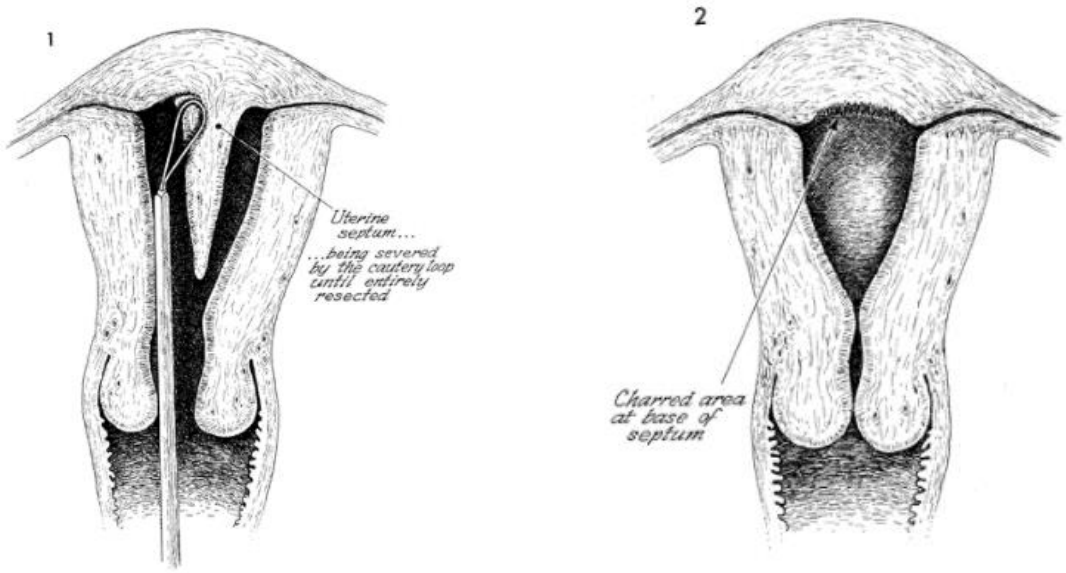


Fig: Hysteroscopic resection

JONES OPERATION

- The patient is placed on the operating table in the dorsal position.
- Insert a Foley catheter through the cervix into the endometrial cavity and instill 10 mL of an indigo carmine solution to stain the endometrial cavity prior to the uterine incision.
- A second Foley catheter should be inserted into the bladder.
- The abdomen can be opened through a midline or transverse incision.
- The bowel is packed away, and a self-retaining retractor is used to keep the abdominal wound open.
- The fundus is palpated with the thumb and index finger to locate the extent of the fibrous septum.
- A traction suture is placed in the midportion of the uterus. Additional traction sutures are placed lateral to the fibrous septum.
- Tourniquet is applied to the lower uterine segment for hemostasis or the myometrium is injected at several points with a saline-Pitressin solution (10 international units of Pitressin in 30 mL of saline solution).
- A scalpel is used to open the fundus along the lateral extent of the fibrous septum as determined by palpation of the uterus.

- Traction on the three sutures is maintained by an assistant. Care must be taken at this point so that lateral dissection of the myometrium into the cornual area is avoided to prevent transection of the tube.
- The entire fibrous septum must be excised. A row of 3-0 sutures is placed through the endometrium, closing the endometrium and the innermost layers of the myometrium.
- The second row of 2-0 suture is used to close the myometrium with a mattress suture.

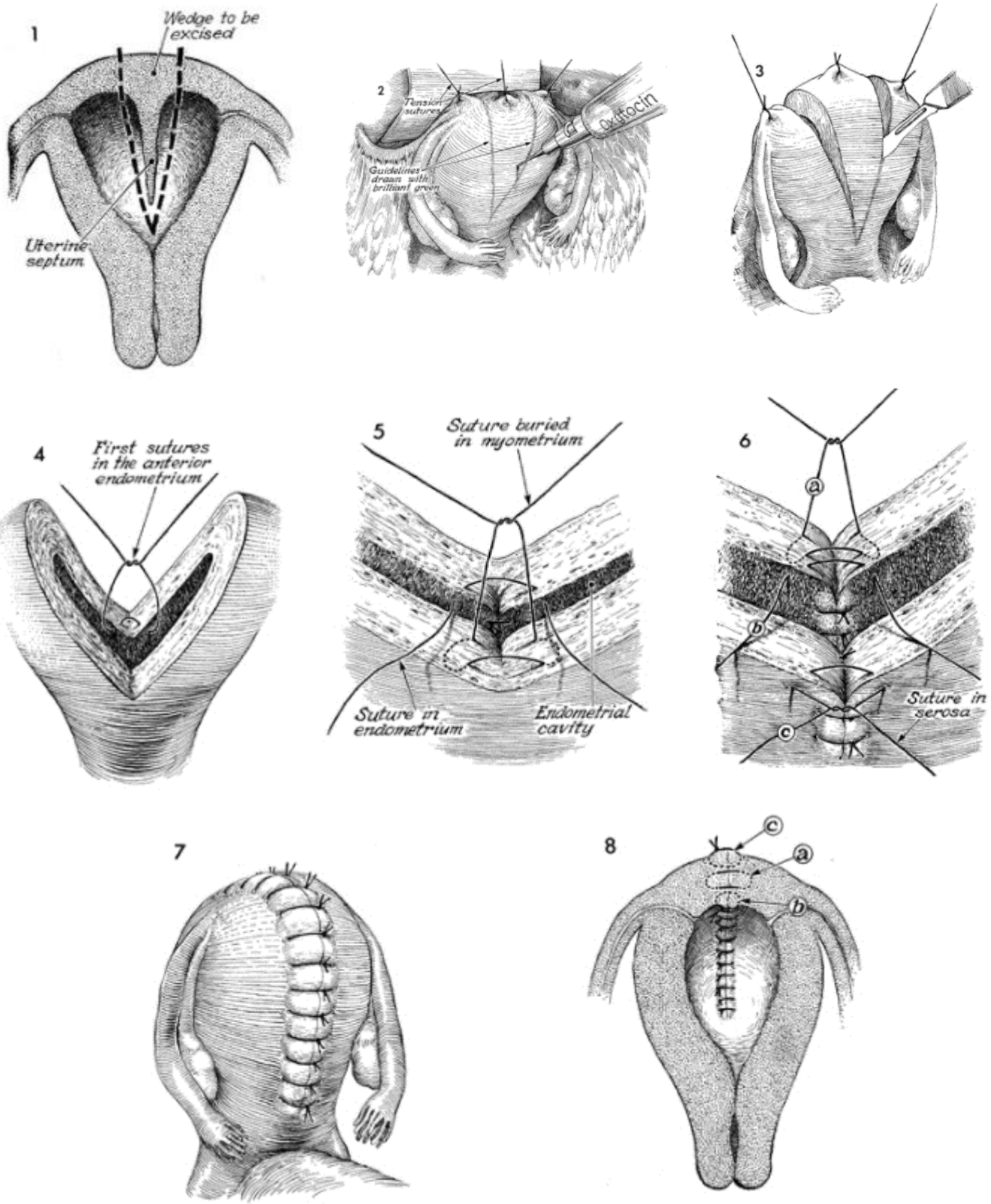


Fig: Jones Operation

Cervical Polypectomy

INTRODUCTION

Cervical polypectomy is a procedure to remove small tumors (polyps), often growing on a stalk, from the opening of the cervix or inside the cervical canal (endocervix).

Cervical polyps are benign growths protruding from the inner surface of the cervix but a very small minority can undergo malignant change. They develop as a result of focal hyperplasia of the columnar epithelium of the endocervix.

They are estimated to be present in 2-5% of women.

CLINICAL FEATURES

- Cervical polyps are often asymptomatic, identified only via routine cervical screening.
- If symptomatic, the most common clinical feature is that of abnormal vaginal bleeding.
- Polyps can also cause increased vaginal discharge.
- Rarely, they grow large enough to block the cervical canal, causing infertility.

DIAGNOSIS

- Speculum examination: cervical polyps are usually visible as polypoid growths projecting through the external os.
- The definitive diagnosis for a cervical polyp is histological examination.

INDICATION FOR EXCISION

- Polyps that cause bleeding or discharge
- Although most polyps are benign, all should be removed and examined because cancerous (malignant) changes may develop in 0.5%.

PREPROCEDURE PREPARATION

- Polypectomy is usually an outpatient procedure performed in the physician's office.
- It is generally painless, so no anesthesia is required.
- The woman lies on the exam table IN Lithotomy position

SURGICAL TECHNIQUES

- A speculum is inserted into the vagina to hold it open to visualize the cervix.
- The cervix is cleansed using a vaginal swab soaked in an antiseptic solution.
- The polyp is grasped with a surgical clamp (hemostat), twisted several times, and pulled until it is freed.
- The polyp is sent for microscopic examination (pathology) to rule out cancer.
- The base of the polyp is then removed by scraping it off with a sharp surgical instrument (curettage), or by using heat, cold, or chemicals to destroy the tissue (cauterization).
- If the polyp is large, or if it is attached by a broad base rather than a stalk, it may need to be cut off and the wound stitched (sutured) closed. This procedure may be done under local anesthesia in the hospital because of the possible risk of excessive bleeding (hemorrhage).
- If the cervix is soft, distended, or partially opened, and the polyp is large or not clearly visible, dilation and curettage (D&C) will be done. The cervical opening will be widened (dilated) so that the cervical canal and uterus may be examined for other polyps.
- All removed polyps should be biopsied for evidence of cancer.

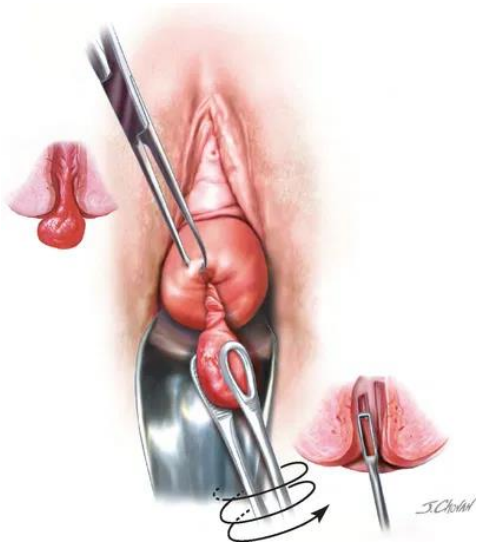


Fig: grasping with forceps and twisting off the polyp (polypectomy)

POSTPROCEDURE CARE

- If bleeding or discharge persists after removal, biopsy is required to exclude cancer.

Ovarian Cystectomy

DEFINITION

Ovarian cyst removal is surgery to remove a cyst or cysts from one or both of ovaries by preserving the ovaries.

INDICATIONS

- Symptomatic cysts
- Large cysts
- Persistent cysts
- Bilateral lesions
- Ultrasound imaging findings that deviate from a simple functional cyst.
- Suspected malignancy

OPERATIVE TECHINIQUE

- ***Skin Incision:*** Abdomen is opened either by transverse or longitudinal incision depending on the size of the ovarian cyst and whether there is any possibility of the tumour being malignant.
- ***Exploration of the abdomen:*** The examination of the entire abdominal cavity is meticulously performed together with the collection of washings from the peritoneal cavity. If there is any free fluid in the abdomen, its presence should be recorded and sent for cytology.
- ***Incising the ovary over the cyst:*** It is often possible to identify the edge of the normal ovarian tissue running along the lower part of the ovary. The knife should be lightly run along this line.
- ***The plane of cleavage*** will readily become apparent and is developed using blunt dissection.
- ***Carrying the incision further around the cyst***: The cyst is gently peeled back from the normal ovarian tissue until all that is left is a thin strip of normal ovary, which is cut with the scissor.

- ***Repair of the remaining ovarian tissue***: Usually, there is a thin rim of redundant capsule which should be resected back to the thicker normal ovarian stroma. The edges of the ovarian tissue are brought together using fine interrupted sutures.
- ***Abdominal closure:*** The ovary is returned to the abdomen and the wound is closed.

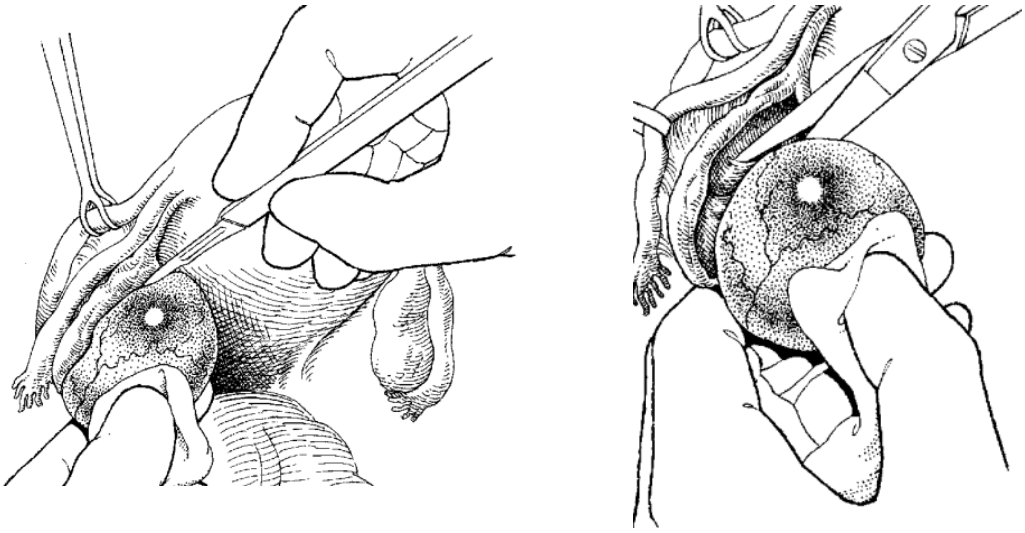


Fig: Ovarian Cystectomy

Manual Vacuum Aspiration(MVA)

DEFINITION:

A manual vacuum aspiration (MVA) is a way of surgically treating abortion (Safe/incomplete abortion) when there is pregnancy tissue remaining within the uterus. MVA uses a cannula to enter and empty the uterus using aspiration (gentle suction).

STEPS IN MVA PROCEDURE

Step 1: Prepare Instruments

- Check that the aspirator retains a vacuum.
- Have more than one aspirator available.

Step 2: Prepare the Woman

- Ensure pain medication is given at the appropriate time.
- Ask the woman to empty her bladder.
- Help her onto the table.
- Ask for her permission to start.
- Put on barriers and wash hands.
- Perform a bimanual exam.

Step 3: Perform cervical antiseptic prep

- Follow No-Touch Technique.
- Use antiseptic sponges to clean cervical os, cervix and, if desired, vaginal walls.
- Do not retrace areas previously cleaned.

Step 4: Administering Paracervical Block

- Inject 1–2mL of anesthetic where tenaculum will be placed then place tenaculum.
- Apply slight traction to move cervix, exposing transition from cervical to vaginal tissue.
- Inject 2–5mL of lidocaine into this tissue to depth of 1–1.5 inches at 3, 5, 7 and 9 o’clock.
- At 4 and 8 o'clock position is also possible
- Usually 10–20mL of 0.5%–1.0% lidocaine (less than 200mg

Step 5: Dilate Cervix

- Dilatation required in most but not all cases.

- Cannula should fit snugly in os to hold vacuum.
- Use gentle operative technique.
- Use progressively larger cannulae.
- Can use mechanical dilators or misoprostol.

Step 6: Insert Cannula

- Gently apply traction to the cervix.
- Rotate the cannula while gently applying pressure.
- Insert cannula slowly until it touches the fundus, then draw it back.
- Alternatively, insert cannula just past internal os.

Step 7: Suction Uterine Contents

- Attach charged aspirator to cannula.
- Release buttons to start suction.
- Gently rotate cannula 180 degrees in each direction.
- Use a gentle “in and out” motion.
- Do not withdraw cannula opening beyond external os.
- Check for signs of completion
    - Red or pink foam without tissue passing through cannula
    - Gritty sensation over surface of uterus
    - Uterus contracting around cannula
    - Increased uterine cramping
- If the procedure is completed
    - Push buttons down and forward to close valve.
    - Disconnect cannula from aspirator OR
    - Remove cannula from uterus without disconnecting.
    - May evacuate again after inspecting POC, if needed.

Step 8: Inspect tissue

- Empty contents of aspirator into container.
- Look for POC; villi and decidua should be visible.
- Evaluate amount of POC based on estimated length of pregnancy.
- Determine that all POC have been evacuated.
- Strain POC, float in water or vinegar, view with light underneath.

Step 9: Perform any concurrent procedures

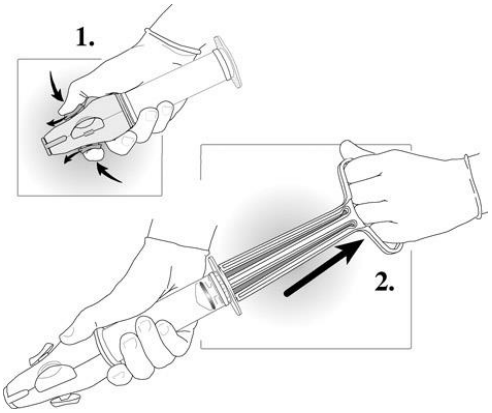
- Wipe the cervix with swab to assess additional bleeding.
- Perform bimanual exam to check uterine size and firmness
- Perform concurrent procedure such as IUD insertion, tubal ligation.

Step 10: Process Instruments

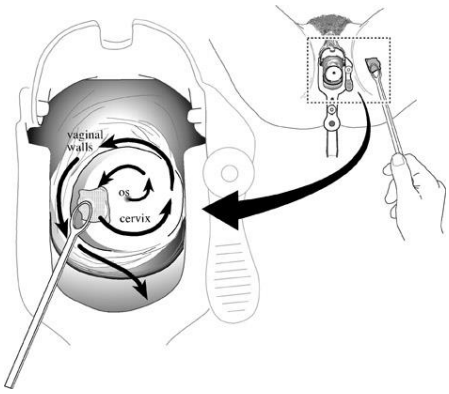
- Process or discard instruments immediately.

POST-PROCEDURE CARE

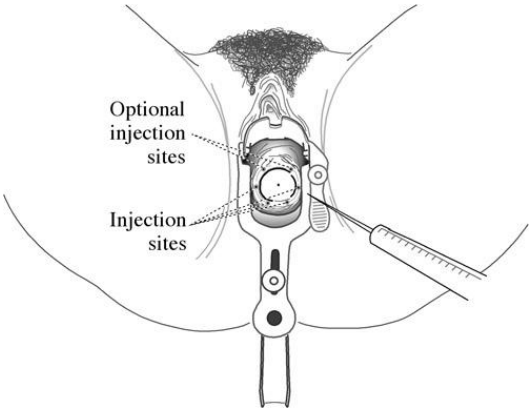
- Physical monitoring
- Pain management
- Provision of antibiotics
- Emotional monitoring and support
- Contraceptive counseling
- Addressing other health issues
- Scheduling follow-up care
- Providing discharge instructions



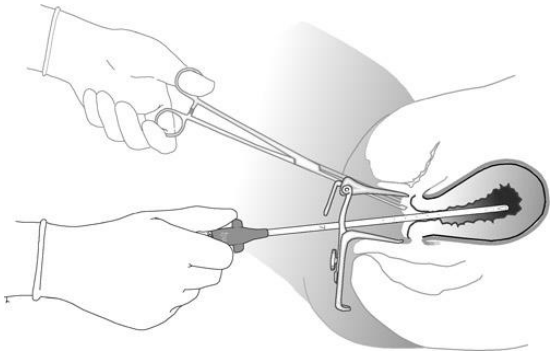
1- Prepare the instrument



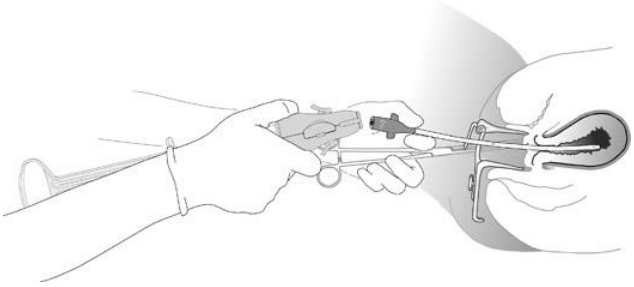
2- Perform cervical antiseptic prep



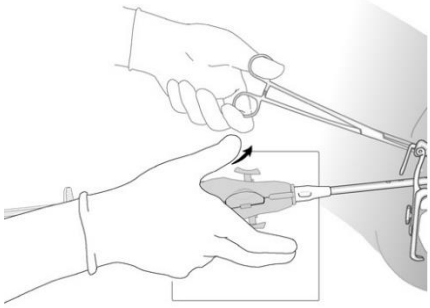
3- Paracervical Block



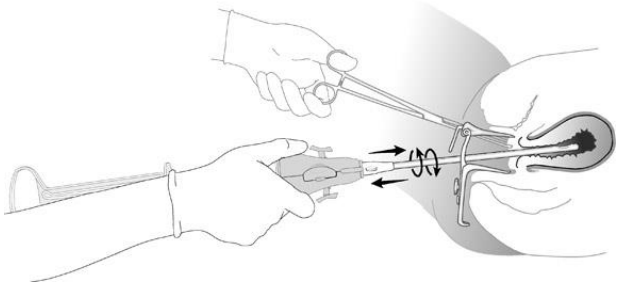
4- Insert Cannula Into Uterus



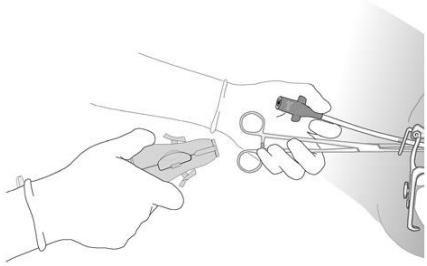
5- Attach aspirator



6- Release Buttons



7- Evacuate uterine contents



8- Detach cannula from aspirator

Fig: Manual Vacuum Aspiration

DILATATION AND EVACUATION

DEFINITION

Dilation and evacuation is the dilation of the cervix and surgical evacuation of the uterus after the first trimester of pregnancy.

INDICATION

- Contraindications to medical abortion (such as chronic adrenal failure, allergy to one of the drugs)
- Women who are otherwise healthy should be offered a method of their choice.

CONTRAINDICATION

- Gestational age above 24 weeks

PREPROCEDURE EVALUATION

- A complete patient history should be obtained
- Assess gestational age
- Discuss post-abortion contraception and note choice in the chart
- Informed consent
- Send patient for necessary investigations (Hematocrit/hemoglobin, Blood group and Rh)
- Ensure informed decision making

PAIN MANAGEMENT FOR D AND E

- Pre-procedure medication- to be given 30 minutes before the procedure
- Recommend using one NSAID plus one opioid and/or one anxiolytic
- Paracervical block -1% lidocaine 20 ml in total.

PAIN CONTROL DURING INSERTION OF LAMINARIA

- Give 1% lidocaine 2-3 ml at tenaculum site
- Pre-procedure medication- to be given 30 minutes before procedure (optional after discussion with the patient)

CERVICAL PREPARATION FOR D AND E

12-16 weeks

- **Two-day regimen:** Mifepristone 200 mg oral 1 day before the procedure and misoprostol 400 µg sublingual/vaginal/buccal 2-4 hours prior to the procedure or
- **One-day regimen:** Misoprostol 400 µg sublingual/vaginal/buccal 2-4 hours prior to procedure and optional 2nd dose of misoprostol 400 µg prior to the procedure depending on cervical status
- May also use osmotic dilators prior to procedure
    - 12-24 hours if using laminaria
    - 4-6 hours (minimum) if using dilapan prior to procedure.

16-20 weeks

- Mifepristone 200 mg oral + laminaria on the first day
- Then Misoprostol 400 µg sublingual/vaginal/buccal 2-4 hours prior to the procedure

20-24 weeks

- Mifepristone 200 mg oral + laminaria on the first day.
- On day of procedure, give Misoprostol 400 µg sublingual/vaginal/buccal 2-4 hours before the procedure

SECOND TRIMESTER D&E PROCEDURE

- Use ultrasound guidance, particularly if the gestational age is above 20 weeks
- Drain the amniotic fluid first. This will bring the fetal tissue closer to the cervix, which is safer.
- Use forceps to grasp the fetal tissue and remove from the uterus
- As much as possible remove the tissue in intact manner (this is largely depends on the extent of cervical dilation)
- Do not pull large parts against a small cervical opening – disarticulate the part not to damage the cervix
- Use larger forceps for larger gestational ages
    - Over 20 weeks, prefer large Bierer forceps or Blumenthal forceps
    - Under 20 weeks, small forceps often adequate (Sopher, etc.)

- Gently remove the placenta, if possible intact placenta
- Once all the fetal and placental tissue is removed, complete the procedure using MVA and 12 mm size cannula
- Assess for presence of bleeding/cervical trauma, etc.
- Assess fetal tissue and ensure completeness

POSTPROCEDURE CARE

- Provide contraceptive method of her choice
- Anti-D for Rh negative unsensitized woman.
- Monitor vital signs and follow for vaginal bleeding.
- If the patient is stable, discharge after 2-4 hours.
- Advice to come back if there is
    - Too much bleeding (Soaking more than two pads per hour for two consecutive hours)
    - Any heavy bleeding that makes the woman uncomfortable or symptomatic (dizziness, lightheadedness or fatigue)
    - If the bleeding continues for more than 2 weeks
    - Fever and/or severe abdominal pain/cramp
    - Bad smelling or unusual vagina discharge with or without abdominal pain/cramp

Bilateral Tubal Ligation: Parkland procedure

INTRODUCTION

Definition: Tubal ligation is a surgical procedure for female sterilization in which the fallopian tubes are permanently blocked or removed.

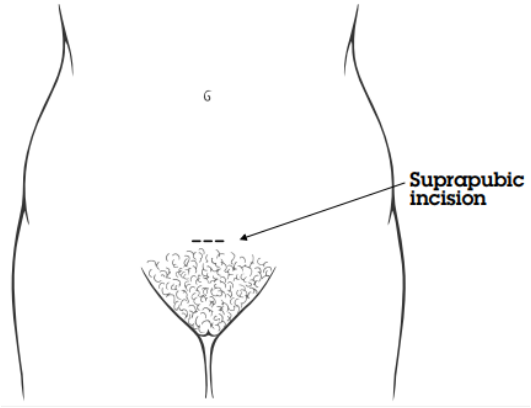
Timing:

- Postpartum: Usually within 48 hours of delivery
- Postabortion: Usually immediately after an abortion
- interval sterilization: Not associated with a pregnancy

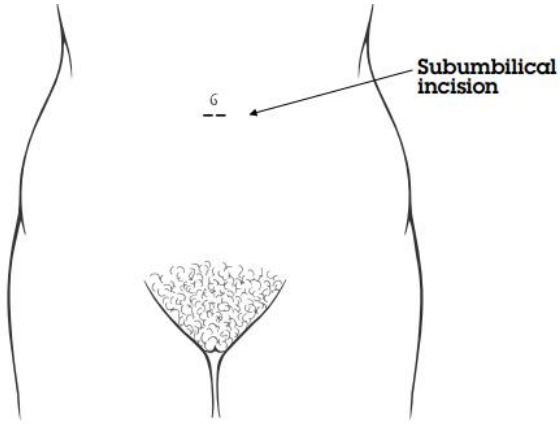
Accessing the fallopian tubes:

- Laparotomy: immediately after cesarean section
- Laparoscopy:
- Minilaparatomy:
- ***suprapubic procedure***: When the uterus is normal or close to normal in size the tubes are accessed through an incision above the pubic bone. (e.g., in interval clients or after an uncomplicated first-trimester abortion),
- ***subumbilical procedure***: Following delivery, the tubes are high in the abdomen and can be approached by an incision under the umbilicus.

NB: *From day 3 to day 28 postpartum, minilaparotomy is not recommended: Because the uterus is descending and is not yet fully involuted.*



Suprapubic—appropriate for interval and postabortion



Subumbilical—appropriate for postpartum procedures

PREOPERATIVE PREPARATIONS

- Give complete, nonbiased information about the procedure and alternatives to surgery
- Take written consent

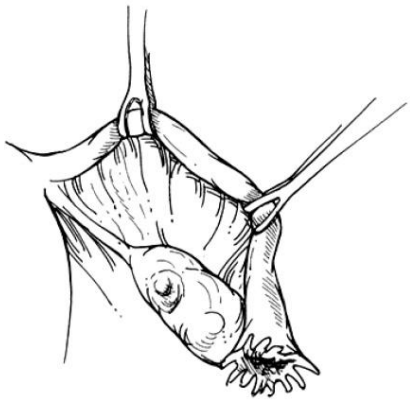
SURGICAL TECHNIQUES

The most commonly used and recommended method is Parkland procedure. (synonyms: modified Pomeroy procedure or partial salpingectomy)

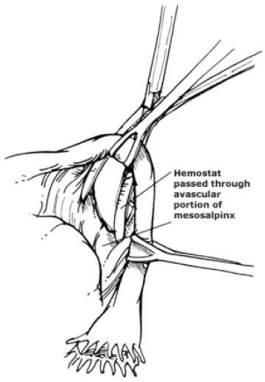
- Identify the avascular section of the mesosalpinx
- window is created in this region below the tube, scissors or a hemostat while elevating the tube with Babcock/ Allis clamps.
- By opening the hemostat or scissors within the window it can be stretched in parallel with the tubal lumen.
- A 2-cm segment of the mid-portion of the tube is then ligated proximally and distally with separate 0 chromic, or plain gut, sutures.
- The segment between the suture ligatures is then excised.

COMPLICATIONS

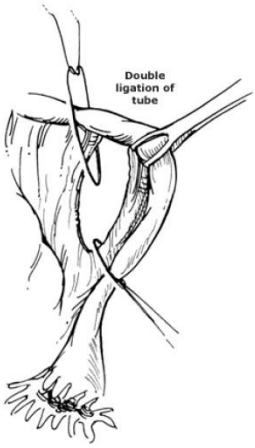
- The failure rate is two to four pregnancies per 1000 operations



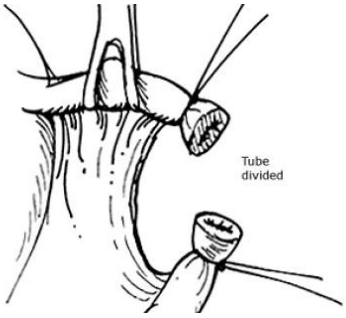
Identification of avascular region of mid-portion of tube.



Window through mesosalpinx is created below the tube.



Rapidly absorbable (0 chromic or plain gut) sutures placed proximally and distallv.



Rapidly absorbable (0 chromic or plain gut) sutures placed proximally and distallv.

Correction of an Incompetent Cervix - Mcdonald Operation

INTRODUCTION

- Cervical cerclage is defined as placement of a stitch in an attempt to improve the tensile strength of the cervix.
- A cerclage can be placed from a transvaginal or transabdominal approach. The McDonald operation is the most common type of cervical cerclage used in a pregnant patient with an incompetent cervix.
- The optimal time to place a cerclage is between 16-18 weeks.

INDICATIONS

- ***History indicated:*** at least one delivery in the second trimester resulting from painless dilatation of cervix.
- ***Ultrasound indicated:*** in patients who are discovered during pregnancy to have a dilated or shortened cervix

PREOPERATIVE PREPARATION/ MANAGEMENT

- The fetus needs to be evaluated prior to placement of a cerclage for presence of congenital anomaly.
- In urgent or emergency cerclage, the membranes have been exposed to the vaginal flora, and hence the pregnancy and the mother are both at risk of infection. In these cases, a single dose of antibiotics may be used to provide broad coverage.
- Use appropriate anesthesia/ analgesia
- Bladder is emptied
- Place the patient in the dorsal lithotomy position.
- The vulva and vagina are cleaned and prepped

SURGICAL TECHNIQUES

- Use speculum (preferably weighted speculum) to retract the posterior-inferior vaginal wall. Have an assistant hold one or two right-angle retractors to retract the other aspects of the vaginal wall, including the bladder anteriorly, as needed.

- The cervix is exposed and grasped by Allis' or Babcock forceps as high in the vagina as possible. This Allis is used to retract cervical tissue inferiorly and laterally, to ensure that only cervical tissue is included in the bite and that the cervical canal is not violated or entered.
- A purse string suture is applied using Silk #2 or Prolene #1 suture around the exo-cervix as high as possible to approximate to the level of the internal os. This is at the junction of the rugose vagina and smooth cervix. Note the distance from the external os to the cervico-vesical fold; it should be 2 cm or farther. (If it is less than 2 cm, another type of cerclage may be preferable.)
- Four to six such bites with the needle are made, with special attention to the stitches behind the cervix.
- The stitch is pulled tight enough to close the internal os, the knot being made in front of the cervix and the end left long enough to facilitate subsequent division.
- The suture must be cut at term or prior to labor and delivery of the fetus.

POSTOPERATIVE CARE

- Patient is discharged after recovery from the anesthetic and when she is able to ambulate and void.
- Acetaminophen alone usually provides adequate analgesia for most women.
- regular visits for cervical check. (cerclage may fail as the uterus enlarges resulting in cervical dilatation. This may be an indication for a rescue cerclage)

COMPLICATIONS

- Rupture of membranes
- Increased frequency of uterine contractions
- Infection
- BleedingInjury to the cervix or bladder

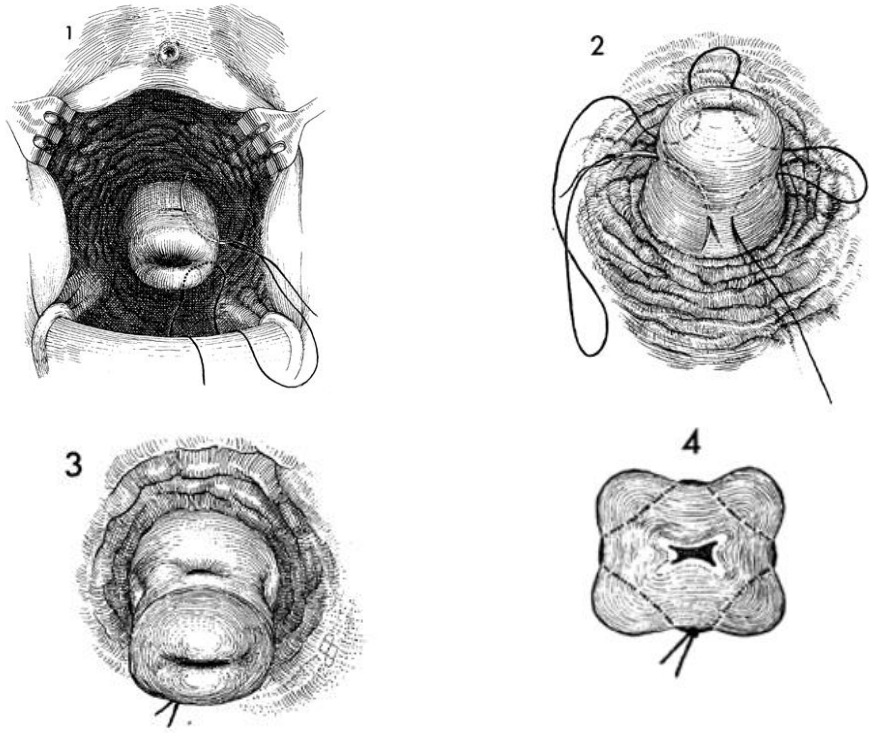


Fig: Steps in McDonald's operation

PROCEDURES FOR UROGYNECOLOGY

Anterior colporrhaphy

INTRODUCTION

- The objective of anterior colporrhaphy is to plicate the layers of vaginal muscularis and adventitia overlying the bladder (‘pubocervical fascia’).
- Anterior colporrhaphy is a relatively simple surgical technique that helps many women, at least temporarily. The complication rate is low and the overall stress to the body is limited.

INDICATIONS

- symptomatic central defect in the anterior compartment
- the classic cystocele
- cystocele treatment as part of other pelvic floor reconstructions

CONTRAINDICATIONS

- high risk of recurrence
- an isolated lateral defect in the anterior compartment.

OPERATION PLANNING

- Patient history, clinical examination, documentation
- Urogynecologic examination (to rule out stress incontinence)
- Exclusion of other gynecologic pathology (sonography, Pap smear)
- Patient informed about conservative and surgical alternatives: pessary,primary mesh implantation
- Informed consent to procedure
- Possibly estrogen treatment of the vagina for 4 weeks
- Preliminary anesthesiologic examination depending on age and local standards
- Thrombosis prophylaxis: LMWH, ATS
- Antibiotic prophylaxis: cephalosporin 1st/2nd generation < 30 minutes before surgery
- Moderately difficult operation; time required 1–2 hours, surgeon and two assistants

PROCEDURE

Preparation

- Intubation anesthesia or epidural anesthesia/spinal anesthesia (by request)
- Lithotomy position
- Skin preparation and sterile draping with vaginal window
- Indwelling transurethral catheter

Operation techniques

- Saline solution is sprayed around and under the posterior wall of the vagina, with or without the addition of vasoconstrictors. This produces aqua dissection of the layers and better hemostasis.
- Median anterior colpotomy starting at the vaginal stump (after hysterectomy) or close to the cervix near the uterovesical fold (uterus in situ).
- The vaginal wall is fanned open on one side: the vesicovaginal fascia with the bladder underlying it is dissected off the vaginal wall. Various techniques are possible: sharp, with the scalpel or electrocautery, with fine or special dissecting scissors and, after the correct layer has been found, blunt, with a dissecting sponge or a cloth-covered finger.
- The upper boundary of the dissection is the bladder pillars on both sides, where the danger of hemorrhage is increased. There should be no dissection at the neck of the bladder because this risks urination disorders.
- The freed vesicovaginal fascia is pulled together with transversely set sutures (interrupted, U-sutures, Z-sutures). This basically doubles the fascia; the sutures should be placed as far lateral as possible in order to obtain the maximal effect. If the sutures are very far lateral, the course of the ureter must be kept in mind.
- “Excess” vaginal mucosa is sparingly resected. Some authors reject any resection on the grounds of the elastic properties of the vagina.
- The colpotomy is closed with interrupted or continuous suture (3–0).
- The transurethral vesical catheter is left in place. Cystoscopy if necessary.
- Vaginal tamponade.

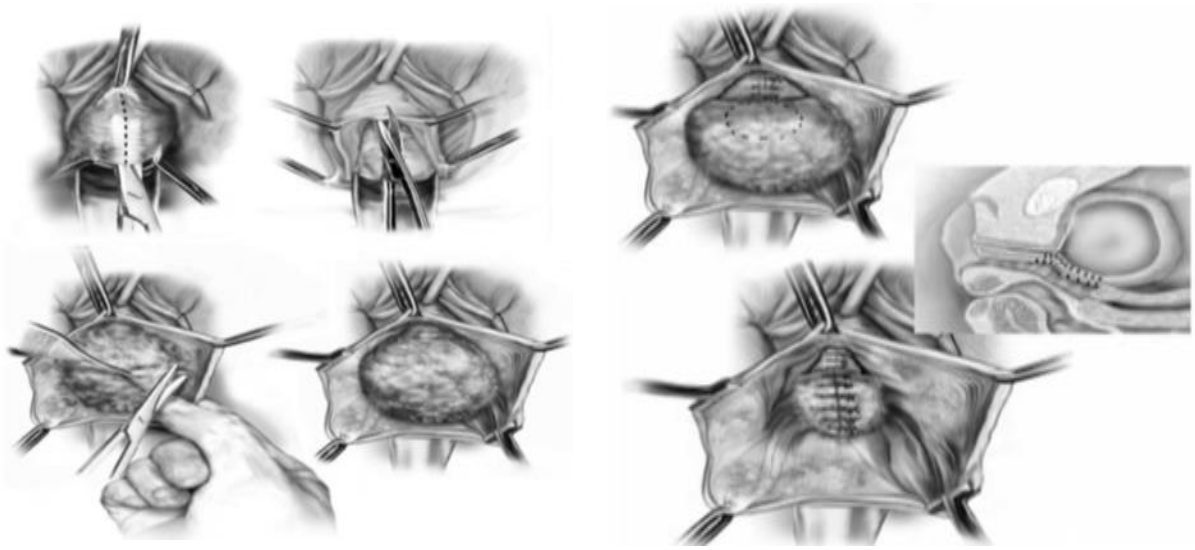


Fig: Anterior colporrhaphy procedures

COMPLICATIONS

- Hemorrhage
- Bladder injury
- Urination disorders
- Failure—recurrent cystoceles.

POSTOPERATIVE CARE

- An indwelling bladder catheter is kept for 24–48 hours
- Remove the vaginal tamponade after 24 hours.
- No sexual intercourse for 6 weeks and only very limited lifting.

Vaginal Paravaginal (Lateral) repair

INTRODUCTION

The goal of the paravaginal defect repair is to correct anterior vaginal wall prolapse that results from loss of lateral support by reattaching the lateral vaginal sulcus to its normal attachment site along the ATFP. This can be performed abdominally (retropubically), vaginally, or laparoscopically.

INDICATIONS

- the symptomatic lateral defect in the anterior compartment, clinically expressed as cystoceles
- treatment of a cystocele during other procedures for pelvic floor reconstruction.

OPERATION PLANNING

- Patient history, clinical examination, documentation
- Urogynecologic examination (to rule out stress incontinence)
- Exclusion of other gynecologic pathology (sonography, Pap smear)
- Patient is informed about conservative and surgical alternatives: pessary, primary mesh implantation
- Informed consent to procedure is obtained.
- Possibly estrogen treatment of the vagina for 4 weeks
- Preliminary anesthesiological examination depending on age and local standard
- Thrombosis prophylaxis: LMWH, ATS
- Antibiotic prophylaxis: cephalosporin 1st/2nd generation < 30 minutes before surgery
- Moderately difficult operation; time required 1–2 hours, surgeon and two assistants

PROCEDURE

Preparation

- Intubation anesthesia or epidural anesthesia/spinal anesthesia (by request)
- Lithotomy position
- Skin preparation and sterile draping with vaginal window

- Indwelling transurethral catheter

Surgical Techiniques

- A Foley catheter is placed in the bladder.
- After complete sharp dissection of the anterior vaginal mucosa, the endopelvic fascia is sharply incised using Metzenbaum scissors, thereby entering the retropubic space.
- Medial retraction allows visualization of the pelvic sidewall and the arcus tendineus fascia pelvis.
- The lateral vagina is then reattached to the pelvic sidewall with a series of interrupted permanent sutures through the lateral vagina and arcus tendineus fascia pelvis.The interrupted sutures are not tied until all have been placed.
- Tying of the sutures results in closure of the lateral vaginal support defect

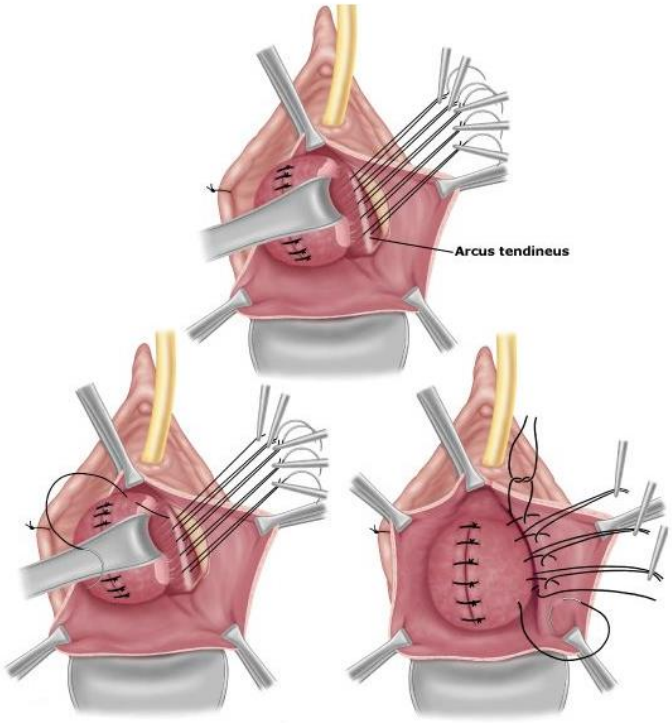


Fig: Vaginal Paravaginal (Lateral) repair

COMPLICATIONS

- Hemorrhage
- Bladder injury
- Urination disorders
- Failure—recurrent cystoceles.

POSTOPERATIVE CARE

- An indwelling bladder catheter is kept for 24–48 hours
- Remove the vaginal tamponade after 24 hours.
- No sexual intercourse for 6 weeks and only very limited lifting.

Abdominal paravaginal (Lateral) repair

INDICATIONS

- symptomatic anterior prolapse (cystocele) with clinically confirmed lateral defect
- simultaneous abdominal retropubic colposuspension for stress incontinence. (for simultaneous abdominal intervention)

CONTRAINDICATIONS

- clinically significant tendency to severe bleeding
- dominant anterocentral defect
- pronounced obesity (with resulting chronically elevated intra-abdominal pressure)
- chronic bronchitis (with resulting chronically elevated intra-abdominal pressure)

OPERATION PLANNING

- Patient history, clinical examination, documentation
- Urodynamic examination
- Exclusion of other gynecologic pathology (sonography, Pap smear)
- Patient is informed about conservative and surgical alternatives: pelvic floor training, insertion of a pessary, vaginal procedure, laparoscopic procedure
- Informed consent to procedure is obtained.
- Preliminary anesthesiological examination depending on age and local standard

- Thrombosis prophylaxis: LMWH, ATS
- Antibiotic prophylaxis: cephalosporin 1st/2nd generation < 30 minutes before surgery
- Moderately difficult surgery, time required is 1–2 hours, surgeon and at least one assistant

PROCEDURE

Preparation

- Intubation anesthesia or spinal anesthesia
- Lithotomy position
- Skin preparation and sterile draping: abdominal and vaginal approach
- Bladder catheter with slight traction (for optimal placement and marking of the vesicourethral transition)

Operation

- Transverse suprasymphyseal incision.
- Dissection of access to retropubic space.
- The rectus muscles are displaced laterally with small abdominal-wall hooks or by opening the peritoneum.
- Blunt dissection to the extent possible in the retropubic space, laterally. The tendinous arch is exposed as far as the ischial spine and the bladder is medialized on the vesicovaginal fascia (pubocervical fascia as part of the pelvic fascia).
- The vesicovaginal fascia is dissected free and the lateral defect in the lateral sulcus is exposed.
- In the dissection, the index and middle fingers can be inserted into the vagina for optimal visualization and creation of counter-tension in the vesicovaginal fascia.
- Note: There is high risk of danger of injury to the Santorini plexus. Options of management in case of injury include targeted electrocoagulation of arterial vessels, targeted suture of venous bleeders and insertion of a damp saline compress for a few minutes.
- The tendinous arch is often but not always recognizable. In each case, the vesicovaginal fascia must be approximated laterally to the fascia of the obturator muscle, thus covering the often distinct defect in the lateral sulcus.
- With the surgeon’s finger inserted in the vagina, appropriately deep sutures are taken into the vesicovaginal fascia/vaginal wall medially, starting anteriorly, approximately at the level of the bladder neck.

- The suture should be affixed laterally to the tendinous arch; this pulls the vagina somewhat dorsal. A constant, slight counter-pressure should be exerted by the transvaginal finger.
- The sutures should be placed from anterior to posterior without knotting; the sutures are only knotted when they are all placed on one side.
- The sutures are knotted. Additional hemostasis if necessary.
- The procedure is repeated on the other side.
- Note that to avoid the danger of injuring the urethra and/or bladder, the vesicourethral transition must be precisely identified by using the catheter balloon, pulled slightly caudad, for orientation.
- Careful hemostasis in the retropubic space, possibly placement of a Redon drain.
- Closure in the usual fashion.

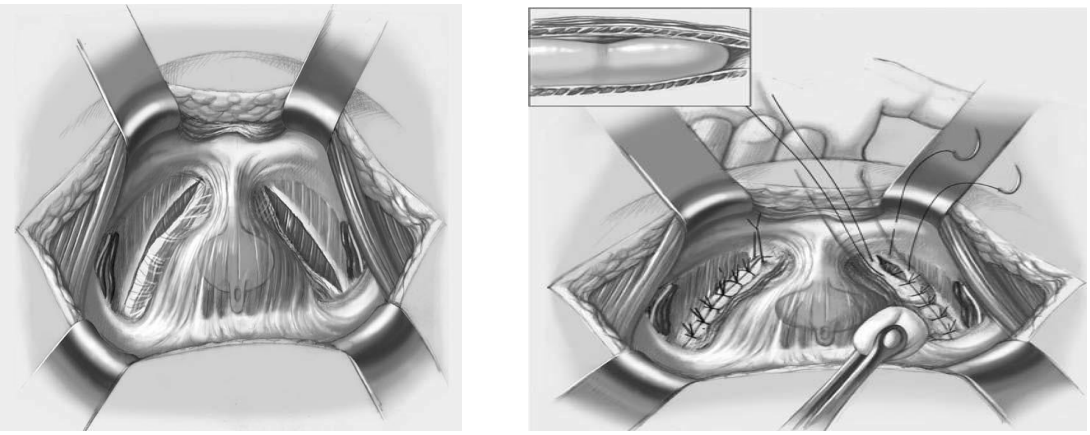


Fig: Abdominal paravaginal repair

COMPLICATIONS

- Hemorrhage
- Injuries to the bladder or urethra.
- Hematoma in the retropubic space
- Infection
- Obstruction of the ureters (rare complication, < 1%)
- Disorders of bladder emptying.
- Recurring prolapses

POSTOPERATIVE CARE

- bladder training
- bladder monitoring

Posterior Colporrhaphy

INDICATIONS

- rectocele
- rectocele treatment in connection with other pelvic floor reconstruction.

CONTRAINDICATIONS

- Recurrent rectocele (in which alternative techniques such as insertion of a mesh are preferred)
- Confirmed intussusception (needs multidisciplinary management)
- Simultaneous severe anal incontinence (the focus of the procedure should be restoration of continence)

OPERATION PLANNING

- Patient history, clinical examination, documentation
- Urogynecologic examination to rule out masked stress incontinence.
- Exclusion of other gynecologic pathology (sonography, Pap smear)
- Patient is informed about conservative and surgical alternatives: pessary, primary mesh implantation
- Informed consent to procedure
- Possibly estrogen treatment of the vagina for 4 weeks
- Preliminary anesthesiological examination depending on age and local standard
- Thrombosis prophylaxis: LMWH, ATS
- Antibiotic prophylaxis: cephalosporin 1st/2nd generation < 30 minutes before surgery
- Moderately difficult operation; time required 1–2 hours, surgeon and two assistants

ANESTHESIA AND POSITIONING

- Positioning: lithotomy position
- Draping: vaginal window
- Anesthesia: intubation anesthesia, spinal anesthesia/epidural anesthesia

PROCEDURE

Preparation

- Intubation anesthesia or epidural anesthesia/spinal anesthesia (by request)
- Lithotomy position
- Skin preparation and sterile draping with vaginal window
- One-time catheter

Operation

- In pelvic floor reconstruction, posterior colporrhaphy is usually the last operative step because of proximity to rectum/anus.
- Saline solution is sprayed around and under the posterior wall of the vagina, with or without the addition of vasoconstrictors. This produces aquadissection of the layers and better hemostasis.
- The posterior commissure is grasped with two clamps at 5 and 7 o'clock (e.g., Kocher clamps), caudal traction is applied, and the rectovaginal septum is entered with sharp dissection. Various incision techniques are possible—a purely sagittal section, a simple transverse incision (inverted T for colpotomy), a diamond-shaped excision, or the Hegar triangle.
- Caution: often, in spite of the rectocele, the external portion of the perineum is not overstretched or is shrunken and inelastic as a result of old episiotomy scars. An excessively long initial skin incision can therefore lead to undesirable narrowing postoperatively.
- The posterior vaginal wall is grasped in the midline, with another Kocher clamp set as far cranial as possible, and stretched.
- The vaginal mucosa is undermined with the dissecting scissors and medial colpotomy is performed; the lateral edges of the wound are grasped with atraumatic clamps (e.g., Allis clamps).
- The rectovaginal septum is dissected and the rectovaginal fascia is separated caudad from the vaginal mucosa.

- Blunt craniad dissection is often possible. As in anterior colporrhaphy, only adequate lateral dissection and sufficient separation of the posterior vaginal wall from the rectovaginal fascia permits adequate evaluation of the vaginal wall, good visualization and repair of defects and adequate posterior colporrhaphy.
- Targeted closure of defects with interrupted sutures: Special care must be taken to avoid tearing the rectovaginal fascia from the perineal body because these defects are hard to correct with non-defect oriented colporrhaphy.

COMPLICATIONS

- Hemorrhage
- Disorders of wound healing
- Injuries to rectum, anus
- Problems with sexual intercourse
- Failure
- Recurrence of rectocele
- Difficulties with defecation.

POSTOPERATIVE CARE

- An indwelling bladder catheter remains in place for 24–48 hours.
- The vaginal tamponade should remain in place for 24 hours.
- No sexual intercourse for 6 weeks and strict restrictions on lifting.

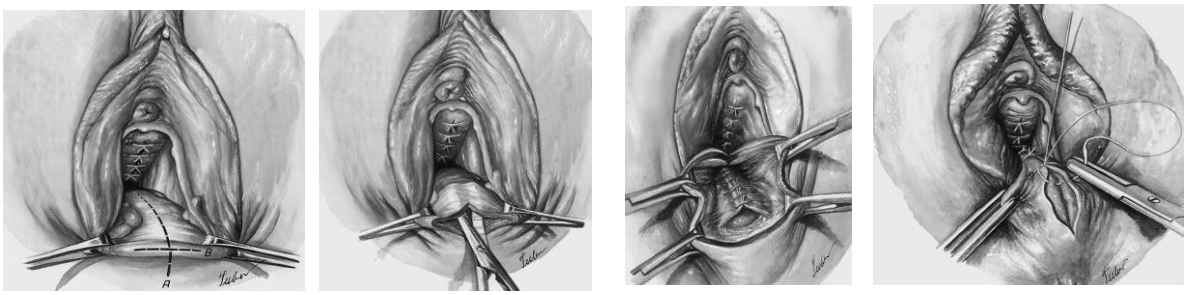


Fig: Posterior colporrhaphy

Perineorrhaphy

INTRODUCTION

Repair of a relaxed vaginal outlet (perineorrhaphy) is often performed concomitantly, with sutures placed to re-approximate damaged bulbocavernosus and transverse perineal musculature.

TECHNIQUES

- A perineorrhaphy, when indicated, completes the vaginal approach to a rectocele repair.
- Allis clamps are placed on the posterior hymen and brought together in the midline. Preservation of three fingerbreadths at the genital hiatus is important for comfortable future coital activity.
- A triangular incision is made medial to the Allis clamps, extending to the midline of the perineal skin, with the base of the triangle at the posterior hymen.
- The bulbospongiosus muscles are plicated in the midline of the perineal body with an interrupted Vicryl No. 0 suture.
- The transverse perinei muscles are plicated.
- An anal sphincteroplasty may be performed, as indicated, for anal incontinence and an external/ internal anal sphincter defect.
- The skin is closed with a running No. 2-0 Vicryl suture.
- Extensive dissection and repair is required for women with an absent perineal body, most commonly as a result of difficult vaginal delivery or surgical trauma.
- A transverse semicircular incision is made in the layer separating the posterior vaginal wall and the anterior rectal wall.
- Dissection is extended laterally and proximally.
- To facilitate proximal dissection in the rectovaginal space without injury to the rectal mucosa, the surgeon may insert a finger of the nondominant hand into the rectum.
- The internal anal sphincter is plicated in the midline with No. 3-0 absorbable suture.
- The rectal mucosa is reapproximated, as needed, with a running absorbable No. 3-0 suture, and extended to the skin overlying the external anal sphincter.
- Dissection of the anus is performed to identify the retracted ends of the external anal sphincter. Care should be taken with this step to avoid extensive lateral and posterior dissection and injury to the inferior hemorrhoidal nerves and vessels.

- The scarred ends of the external anal sphincter are identified and reapproximated in an overlapping fashion with vertical mattress sutures of No. 0-delayed absorbable suture. The scar on the ends of the external anal sphincter is left intact and used for suture placement.
- The transverse perinei and bulbospongiosus muscles are plicated in the midline.
- With midline construction of the perineal body, the transverse portion of the initial incision becomes vertically oriented. The vaginal epithelium is closed with a No. 2-0 absorbable suture.
- The skin of the perineal body is closed in an inverted Y shape with interrupted absorbable No. 2-0 sutures. The patient is instructed that superficial wound breakdown on the perineum may occur. In most cases, this superficial wound breakdown will respond to conservative management rather than require aggressive debridement.

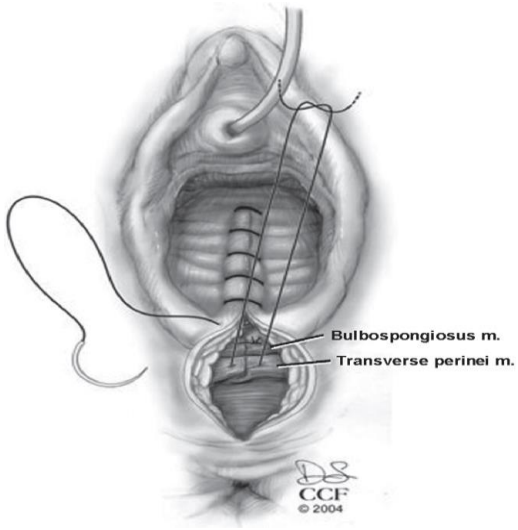


Fig: Posterior colporrhaphy

SACROSPINOUS LIGAMENT FIXATION/ SUSPENSION

DEFINITION

Apical defect procedure that suspends the vaginal apex after hysterectomy/cervix to the sacrospinous ligament

ANATOMY

To perform this procedure, the surgeon must be familiar with the anatomy of the ischial spine, iliococcygeus and coccygeus muscles, sacrospinous ligament, and the surrounding structures in the pararectal space.

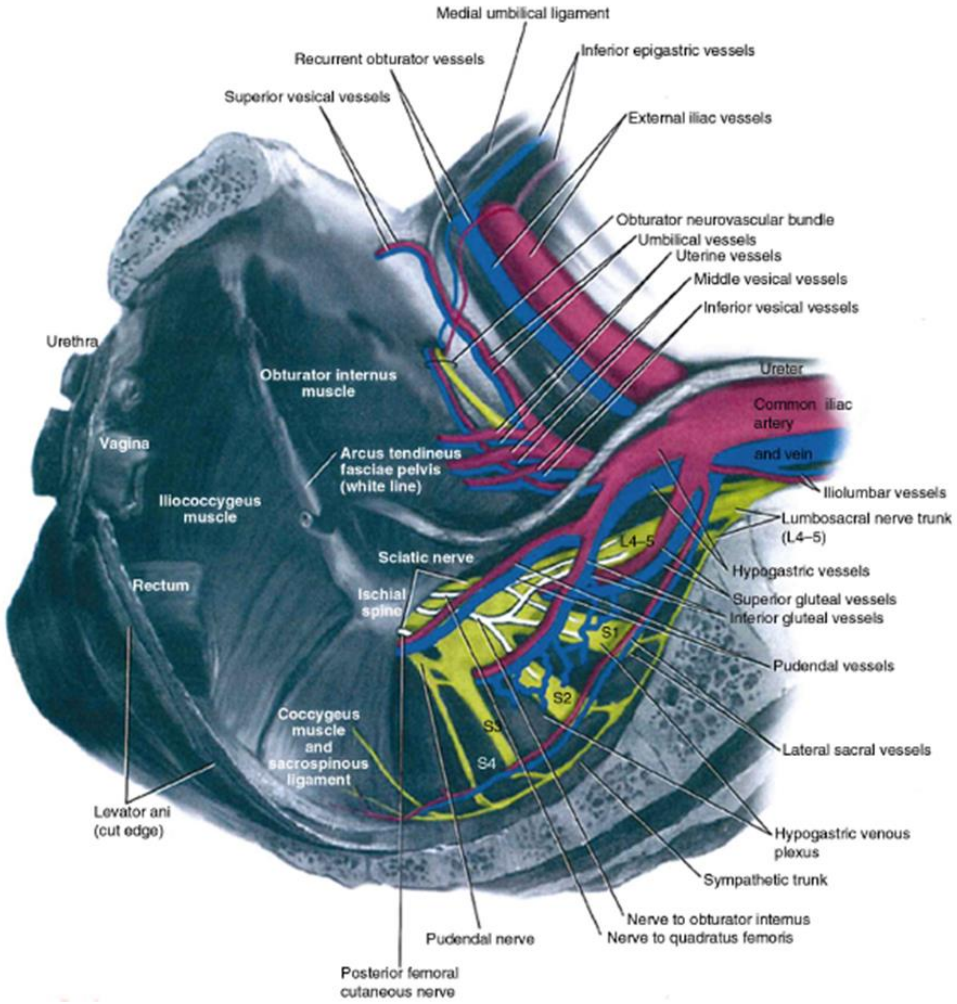


Fig: Right side, Anatomy surrounding the coccygeus muscle–sacrospinous ligament complex

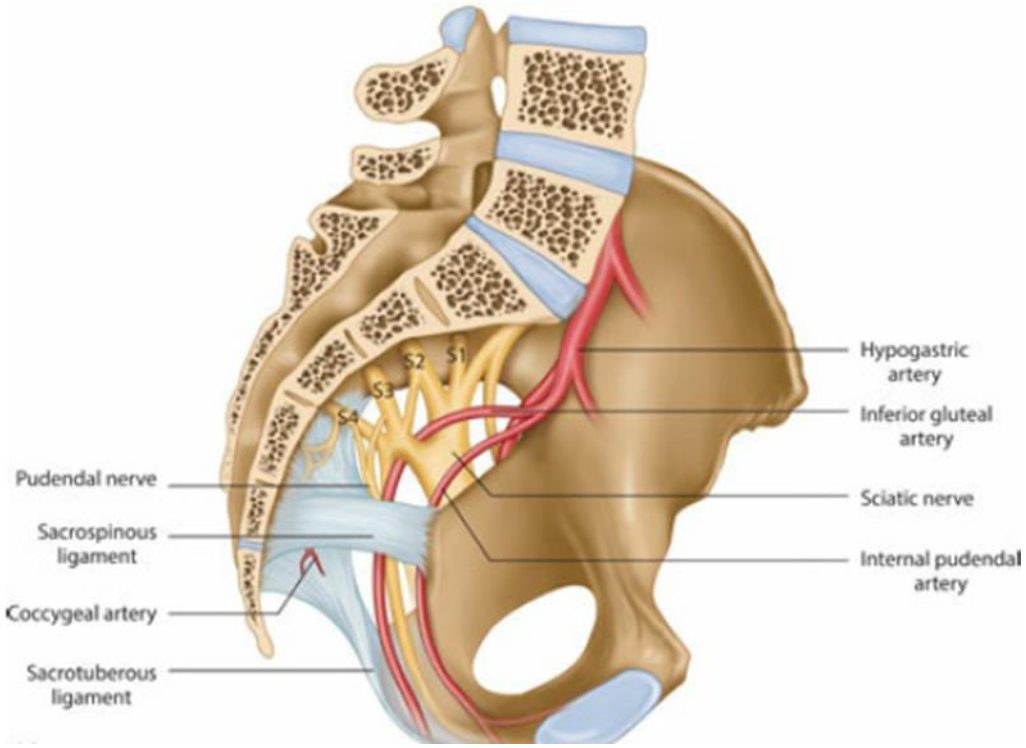


Fig: Left hemi pelvis. The sacrospinous ligament covered by the coccygeus muscle extends from the ischial spine to the sacrum.

INDICATION

- Posthysterectomy vault prolapse
- Accompanying vaginal hysterectomy
- For uterine suspension

PREOPERATIVE EVALUATION AND PREPARATION

- Patient history, physical examination, investigation and documentation
- Cough stress test after the prolapse is reduced (to rule out stress incontinence)
- Exclusion of other gynecologic pathology (pelvic ultrasound, Pap smear/VIA)
- Inform the patient about conservative and surgical alternatives
- Informed consent to the procedure
- Possibly estrogen treatment of the vagina for decubitus ulcer
- Preliminary anesthesiologic evaluation

- Thrombosis prophylaxis based on risk assessment
- Antibiotic prophylaxis with in an hour of surgery
- Anesthesia and Positioning
- Positioning: dorsolithotomy position
- spinal anesthesia
- Skin preparation of perineum and lower abdomen

SURGICAL TECHNIQUES

SSLF can be performed unilaterally or bilaterally, using a posterior approach. Bilateral sacrospinous ligament fixation has been described and recommended in patients with recurrent vault prolapse or a desire to maintain a wide vaginal vault.

Steps in the Procedure:

- If the procedure is done in the setting of vaginal hysterectomy, the hysterectomy is completed and the vaginal cuff is closed
- Identify the intended vaginal apex
- The posterior vagina is incised longitudinally and extended to the cervix/vaginal apex
- The vaginal epithelium is dissected away to expose the rectovaginal space
- A window is created in the rectal pillar to enter the pararectal space with blunt dissection, tip of scissor or hemostat
- A Breisky-Navratil retractor is used to displace the rectum medially and to expose the CSSL complex
- Using a Miya hook, a long curved or straight needle holder, a permanent suture is passed through the CSSL two fingers medial to the ischial spine. The second suture is placed, 1 cm medial to the first
- One end of each suspension suture is sewn into the undersurface of the vagina apex and tied by a half hitch to pull the vagina directly onto the ligament.
- The edges of the vaginal mucosa is then closed
- A posterior colporrhaphy and perineorrhaphy are usually performed after the suspension sutures are tied.
- If an anterior colporrhaphy is planned, this step is most easily accomplished prior to the sacrospinous suspension

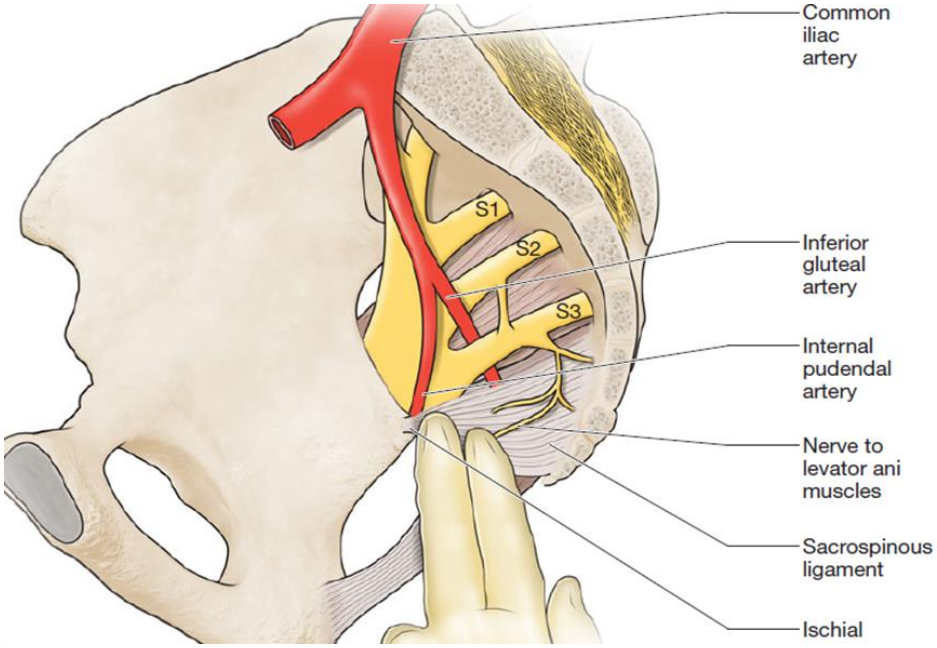


Fig: Sacrospinous spine ligament sutures are placed two finger-breadths medial to the ischial spine

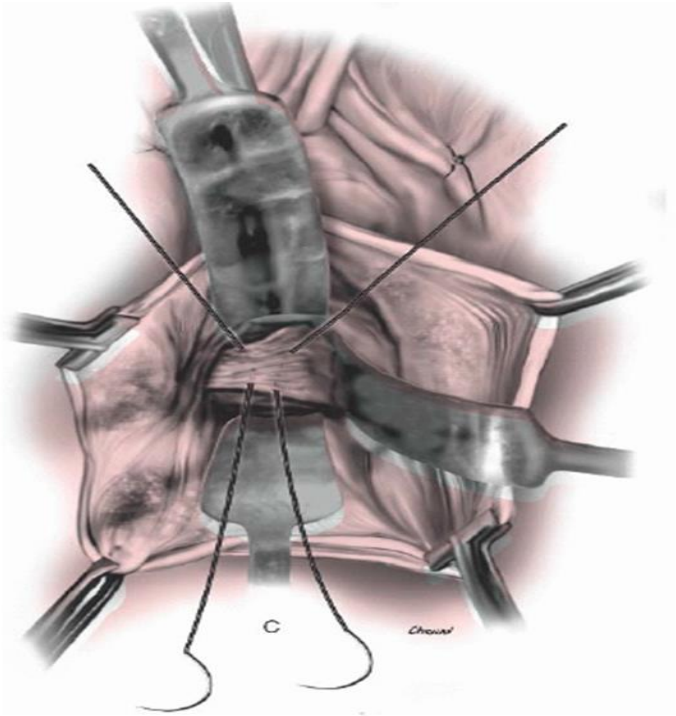


Fig: Two sutures are passed through the sacrospinous ligament

POST-OPERATIVE CARE

- Routine post-operative cares
- Vaginal pack and Foley catheter left for 24 hours after the procedure
- No sexual intercourse for 6 weeks and strict restrictions on lifting

COMPLICATIONS

- Hemorrhage
- Deep pelvic hematomas
- Infection
- Injury to pelvic organs -bladder, rectum and intestine
- Injury to nerves -buttock and lower extremity pain
- Failure—recurrent prolapse - 4.0% to 10.4% for apical prolapse and up to one third of cases if all vaginal segments considered
- Dyspareunia

Uterosacral Ligament suspension

DEFINITION:

Apical suspension procedure that suspends the vaginal apex to the distal ends of the plicated uterosacral ligaments bilaterally.
While the procedure can be performed abdominally or laparoscopically, the transvaginal route is most common.

INDICATION:

- At the time of a vaginal hysterectomy
- Post hysterectomy vault prolapse

PREOPERATIVE EVALUATION AND PREPARATIONS

- Patient history, physical examination, investigation and documentation
- Cough stress test after the prolapse is reduced (to rule out stress incontinence)
- Exclusion of other gynecologic pathology (pelvic ultrasound, Pap smear/VIA)
- Inform the patient about conservative and surgical alternatives

- Informed consent to the procedure
- Possibly estrogen treatment of the vagina for decubitus ulcer
- Preliminary anesthesiologic evaluation
- Thrombosis prophylaxis based on risk assessment
- Antibiotic prophylaxis within an hour of surgery
- Anesthesia and Positioning
- Positioning: dorsolithotomy position
- spinal anesthesia
- Skin preparation of perineum and lower abdomen

SURGICAL TECHNIQUE- STEPS IN THE PROCEDURE

- In the setting of vaginal hysterectomy, the hysterectomy is completed first and for vaginal vault prolapse the apex is grasped with Allis clamps and a colpotomy created
- A Deaver retractor or Breisky -Narveti retractor is placed anteriorly, and the abdominal contents are packed up and out of the pelvis with a moist sponge.
- Identify the uterosacral ligament by applying traction with Allis clamp placed on the vaginal cuff at 5 o'clock or 7 o'clock. Alternatively, the ligament is found posterior and medial to the ischial spine
- By palpation, with a long needle driver, A nonabsorbable suture is placed through the ligament on the sacral side of the ischial spine. Each needle is passed lateral to medial to minimize the risk of injury to the ureter
- Two additional sutures are placed distal (on the sacral side) to the initial suture 1 cm away
- The same procedure is carried out on the opposite side
- One arm of each suspensory suture is placed through the anterior cuff and the other arm placed through the posterior cuff, with the superior sutures placed more medially
- Cystoscopy is performed to evaluate ureteral patency
- The sutures are tied in the sequence in which they are placed and vaginal cuff is closed over the permanent suspension sutures.

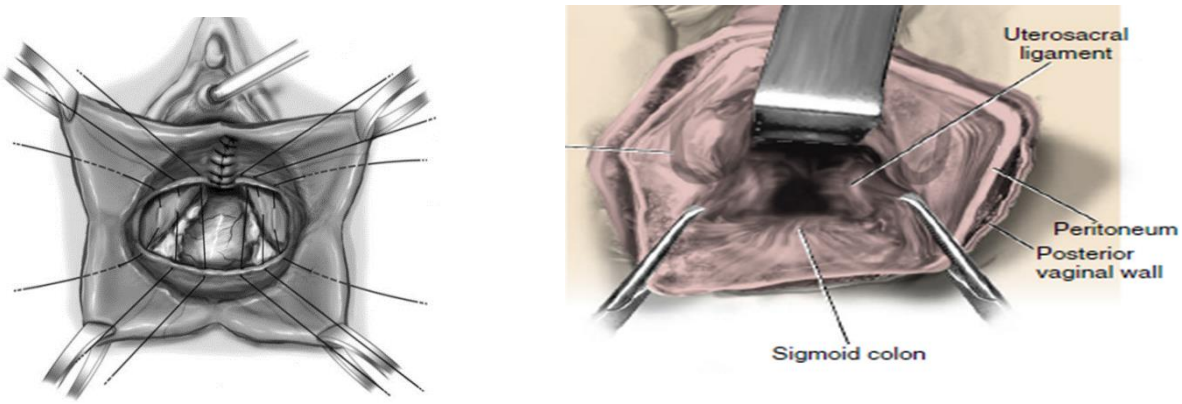


Fig: Uterosacral ligament vaginal suspension

COMPLICATIONS

- Hemorrhage
- Hematoma
- infection
- Injury to bladder, rectum and intestine
- A danger of injuring or kinking the ureter (incidence 2%–10%).
- Failure—recurrent prolapse is 8-34%, recurrence is high if the stages of prolapse is stage III and more
- Chronic low abdominal, buttock and/or thigh pain, numbness pain if uterosacral approximation is high

POSTOPERATIVE CARE

- Routine post-operative cares
- Vaginal pack and Foley catheter left for 24 hours after the procedure
- No sexual intercourse for 6 weeks and strict restrictions on lifting

SACRALCOLPOPEXY

INTRODUCTION

It is the gold standard for treatment of apical prolapse with transabdominal approach. It is suspension of the vagina to the sacral promontory or into the hollow of the sacrum with an intervening mesh

INDICATIONS

- Young patients with advanced prolapse
- Patients who have previously failed a vaginal approach
- Simultaneous indication for abdominal operation
- Patients who have other coexisting conditions that predispose to subsequent failure (obesity, chronic bronchitis)
- Patients who have a foreshortened vagina

STEPS IN THE PROCEDURE

- The patient is positioned in low lithotomy position to have both abdominal and vaginal access
- Abdomen entered through a low transverse suprapubic incision, abdominal contents will be packed out of pelvis and either total or supracervical hysterectomy will be done if planned.
- Both the bladder and rectum must be sufficiently dissected off the vagina
- The presacral space is entered first by creating a peritoneal window about 2-3 cm below the edge of the sacral promontory then electro coagulating presacral l veins and gentle sharp dissection
- The ventral surfaces of the S1 and S2 vertebral bodies are exposed, peritoneal incision extended up to the cul-de-sac while the right ureter is retracted to the right and the sigmoid to the left
- Polypropylene mesh is selected and cut to size so that distally, it must have an anterior wing that will lie in front of the vagina and a posterior wing that will lie behind the vagina. To form the wings, a graft 3 cm wide and 15 cm long can be cut out, folded in half lengthwise, sutured, and split distally

- The anterior and posterior arm of the graft is sewn with the corresponding vaginal walls with interrupted sutures of nonabsorbable monofilament
- Two to three nonabsorbable sutures are placed through the anterior longitudinal ligament. Both ends of each suture are passed through the polypropylene graft and tied down. When the sutures are tied down, the vagina should be elevated without tension on the graft.
- The peritoneum is closed over the graft followed by abdominal wall closure

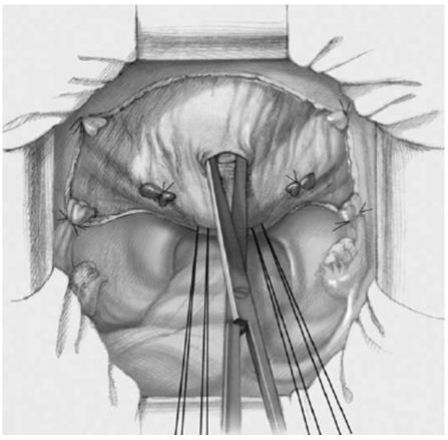


Fig: Dissection in the anterior

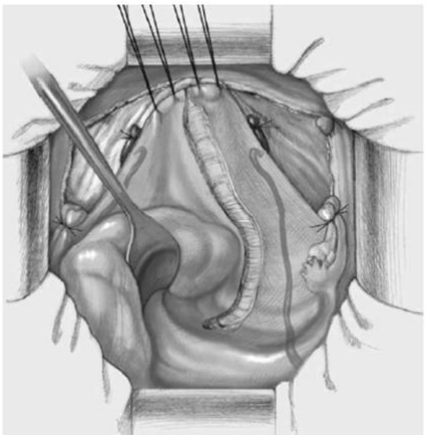


Fig: Dissection in the anterior

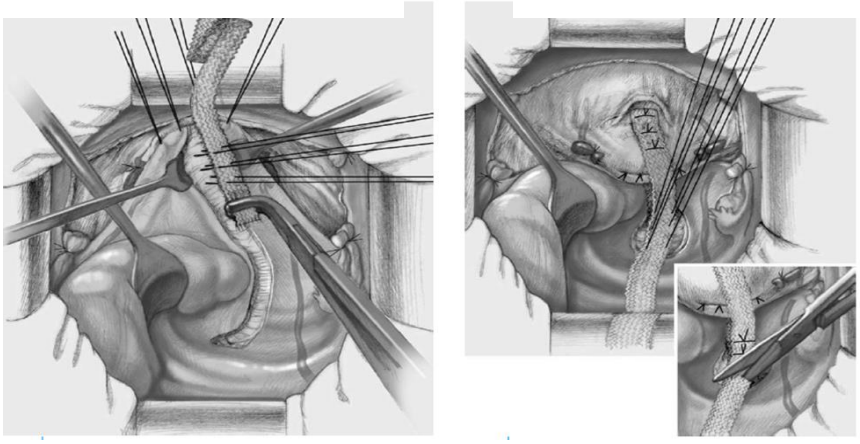


Fig: Mesh placement, suspension to anterior longitudinal ligament and determination of the mesh length

STEPS IN THE MODIFIED SACRALCOLPOPEXY PROCEDURE

- Patients will receive either spinal or general anesthesia in supine position.
- A suprapubic transverse incision will be made starting 3 cm above the symphysis pubis. Abdominal cavity will be entered layer by layer.

- The uterus and the adnexea will be examined for possible pathology.
- First peritoneal window will be opened at the level of the sacral promontory and blunt dissection toward the fixation point 2–3 cm below the edge of the promontory will be made to access anterior longitudinal ligament.
- The ureter is identified and retracted to the right and the sigmoid to the left and sharp dissection will be made along the right uterosacral ligament peritoneal fold to visualize the ipsilateral uterosacral ligament.
- The rectouterine peritoneal fold will be sufficiently dissected away posteriorly to expose the posterior cervix.
- Using sharp dissection along the left uterosacral ligament peritoneal fold starting distally and extending proximally to visualize the distal two-third of left uterosacral ligament.
- Using proline number 0 continuous suturing will be made after generous bite is taken on the posterior cervix by making 1-2cm inter-bite distance along the right uterosacral ligament towards the fixation point at S1-S3.Then continuous suturing will be done back to the posterior cervix along the right uterosacral ligament.
- The same procedure will be done on the distal two-third left uterosacral ligament avoiding fixing on the scrum to avoid rectal narrowing.
- The uterosacral ligaments will be shortened bilaterally by purse stringing by holding the two ends of the stitches to the extent the uterus will be fixed at the presacral level.
- The knot will be tied at the posterior cervix and the retroperitoneum will be fully closed after complete hemostasis.

COMPLICATIONS

- Hemorrhaging from the presacral venous plexus
- Injury to the ureter, bladder, rectum and sigmoid
- Mesh erosion and infection

Vaginal hysterectomy

DEFINITION

Vaginal hysterectomy is a surgical procedure to remove the uterus through the vagina.

INDICATIONS

- Heavy menstrual bleeding
- Pelvic pain
- Uterine prolapse (vaginal hysterectomy)
- Gynaecological malignancy (usually ovarian, uterine or cervical)
- Risk reducing surgery, usually in cases of BRCA 1 or 2 mutations, or Lynch syndrome

PREOPERATIVE EVALUATION AND PREPARATIONS

- **Patient Position:** dorsal lithotomy
- Vaginal hysterectomy may be performed under regional anaesthesia (spinal/ epidural). A general anaesthetic is not required.
- An examination under anesthesia is performed once the patient has been prepared and draped, in dorsal lithotomy position

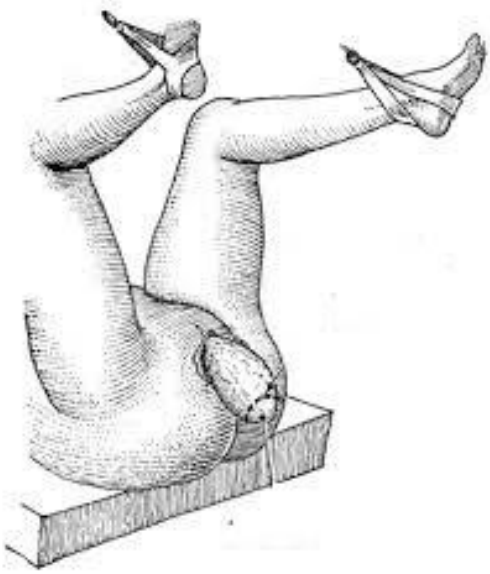


Fig: Patient position for vaginal hysterectomy (with prolapsed uterus)

SURGICAL TECHNIQUE

- Speculum is placed into the posterior vagina, and a right-angle retractor is positioned anterior to the cervix while the anterior and posterior lips of the cervix are grasped with a single- or double-toothed tenaculum.
- Gentle traction in all directions with the vulsellum enables the surgeon to visualize the cervical-vaginal junction, the area where the initial incision will be made. At this time, a paracervical and submucosal injection of 1/2% lidocaine with 1:200,000 or a dilute solution of vasopressin may be used to help decrease operative blood loss, decrease postoperative pain, and as some believe, delineate the surgical planes.
- Vaginal incision is made circumferentially, beginning at the level of the vaginal rugae through the full thickness of the vagina, just below the bladder reflection—not on the.
- The vaginal epithelium is dissected bluntly or sharply to the underlying tissue with an open sponge over the index finger and Mayo scissors.
- The bladder is dissected off the cervix and reflected upwards.
- The posterior peritoneum is then identified where rugae are not present and where the uterosacral ligaments join the cervix.
- The peritoneum is grasped with tissue forceps and incised with Mayo scissors in a generous bite, and a Steiner-Anvard weighted speculum is inserted into the posterior cul-de-sac.
- The uterosacral ligaments are identified and clamped, with the tip of the clamp incorporating the lower portion of the cardinal ligaments.
- The clamp is placed perpendicular to the uterine axis, and the pedicle is cut so that approximately 0.5 cm of tissue is distal to the clamp.
- A transfixion suture is placed at the tip of the clamp and tied. Once ligated, the uterosacral ligaments may be immediately transfixed to the posterolateral vaginal mucosa or held long for use at the end of the case.
- With continued traction on the cervix, the cardinal ligaments are identified, clamped, cut, and suture-ligated. These are attached to the vaginal mucosa as the uterosacral ligaments were to the vaginal mucosa to lend support and aid hemostasis.
- Anteriorly, blunt or sharp advancement of the bladder should continue before each clamp placement until the vesicovaginal space is entered. Once this space is entered, the Heaney or Deaver retractor is placed into the peritoneal cavity.

- The anterior peritoneal fold appears as a crescent-shaped line. The peritoneal reflection is grasped with tissue forceps, tented, and opened with scissors that have their tips pointed toward the uterus.
- Next, the cardinal ligaments are identified, clamped, cut, and suture-ligated in a manner similar to that previously described for the uterosacral ligaments.
- The uterine vessels are then clamped in such a way as to incorporate the anterior and posterior leaves of the visceral peritoneum.
- The uterine fundus is delivered. The utero-ovarian ligament is identified with the surgeon's finger, then clamped and cut. The pedicles are double-ligated, first with a suture tie and then with a suture ligature medial to the first tie. A hemostat is placed on the second suture to assist in the identification of any bleeding.
- If the adnexa are to be removed, traction is placed on the ovary by grasping it with a Babcock clamp. A Heaney clamp is placed across the infundibulopelvic ligament, and the ovary and tube are excised. Both a suture tie and a transfixion suture ligature are placed on this pedicle.
- Check each of the pedicles and confirm that hemostasis is adequate.
- Reapproximate the vaginal epithelium either vertically or horizontally with either a continuous suture or a series of interrupted sutures. These sutures are placed through the full thickness of the vaginal epithelium, with care taken to ensure that the bladder is not entered.
- The uterosacral ligaments are fixed to the upper vagina to prevent prolapse of the vaginal vault.

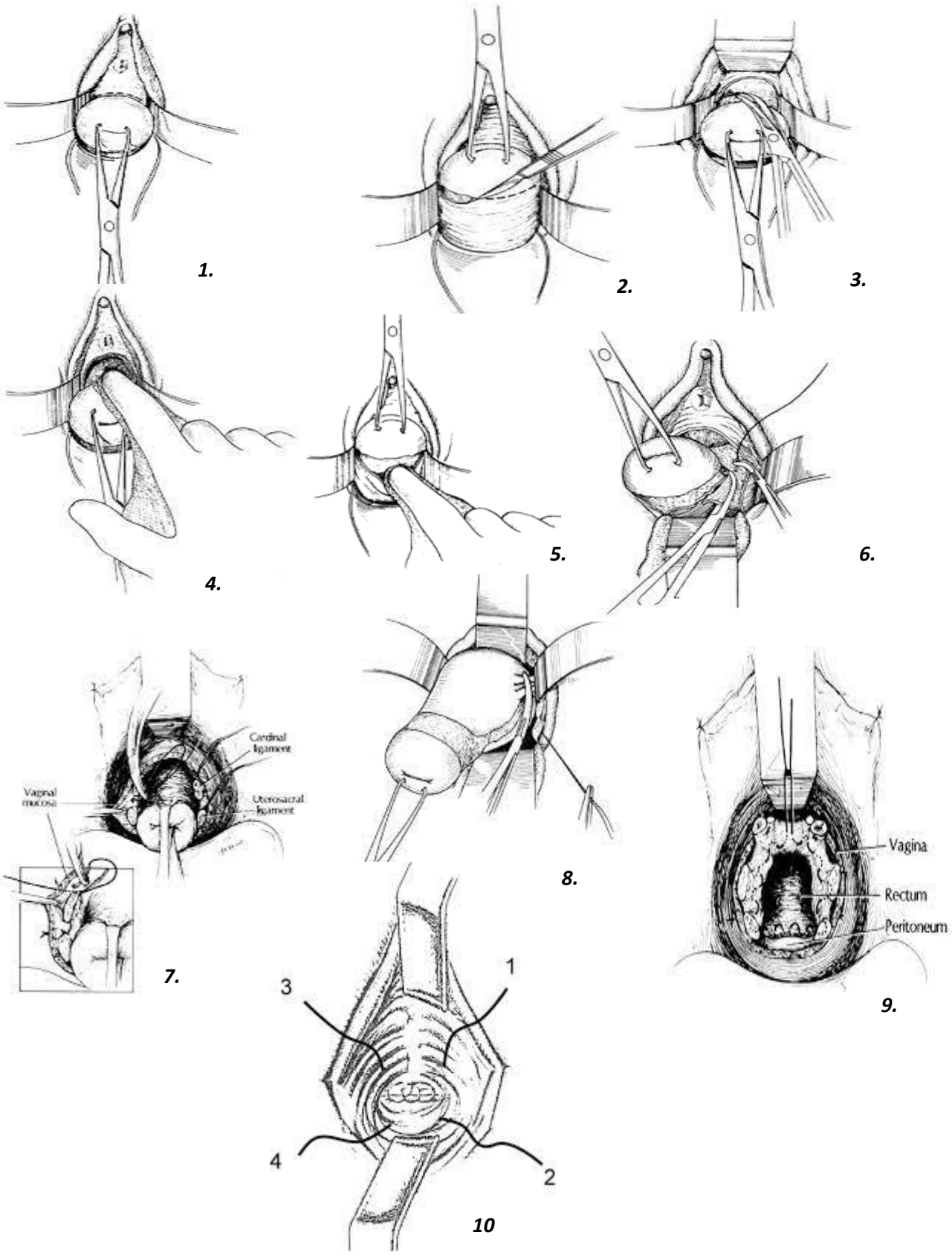


Fig: Surgical steps of vaginal hysterectomy

POSTOPERATIVE CARE

- Vaginal pack for 24 hours (Optional)
- Catheter for 24-48 hours
- Prophylactic antibiotic
- Anti pain
- Avoid intercourse for 6weeks (at least)

COMPLICATIONS

- Damage to the bladder and/or the ureter
- Long-term disturbance to the bladder function
- Damage to the bowel
- Haemorrhage requiring blood transfusion
- Return to theatre because of bleeding/wound dehiscence
- Pelvic abscess/infection
- Venous thrombosis or pulmonary embolism
- Risk of death within 6 weeks

ENTEROCELE REPAIR

INTRODUCTION

An enterocele is a form of pelvic organ prolapse with the bowel protruding into the vagina. It typically occurs as a posterior enterocele, which develops in the rectovaginal space (pouch of Douglas or cul-de-sac) and apical enterocele in the setting of previous hysterectomy. The anterior enterocele in the vesicovaginal space is a rare entity

SURGICAL PROCEDURES FOR ENTEROCELE REPAIR

It is treated by surgical procedures that obliterate the pouch of Douglas either

1. By plicating the peritoneum like the Moschcowitz or Halban operations with several purse string or sagittal vertical sutures These procedures have high risk of recurrence and should be done concomitantly with other pelvic floor surgeries

2. By plicating the uterosacral ligaments and inter-vening peritoneum with internal nonabsorbable and external absorbable sutures like the McCall procedure. It is done in setting of hysterectomy.

STEPS IN THE PROCEDURE

- A midline posterior vaginal wall incision is made over the enterocele sac up to the vaginal apex; it is extended to the perineum if a rectocele is also present
- The enterocele sac should be mobilized from the vaginal walls and rectum
- The peritoneal sac is entered sharply, the enterocele sac is explored digitally to displace small bowel or omentum back to the level of its neck
- The surgeon will choose the technique that will be used to address the enterocele and/ suspend the vaginal vault

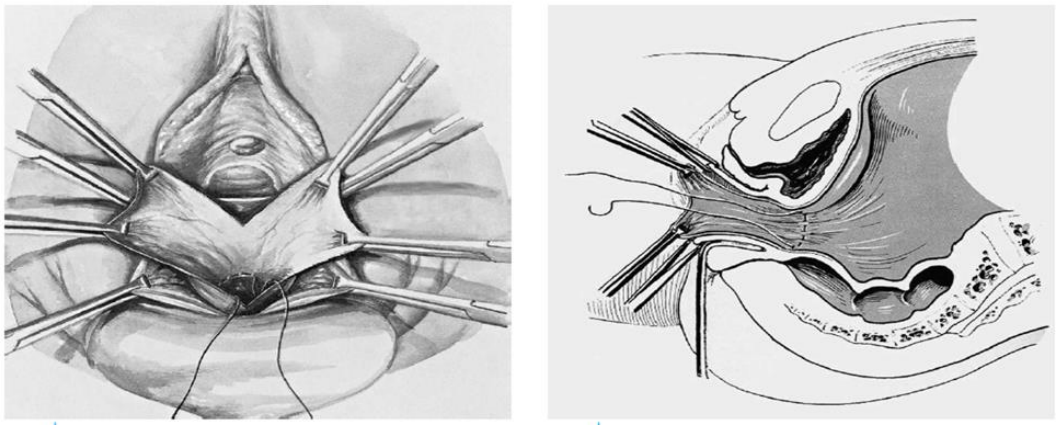


Fig: Vaginal enterocele repair – Moschcowitz technique

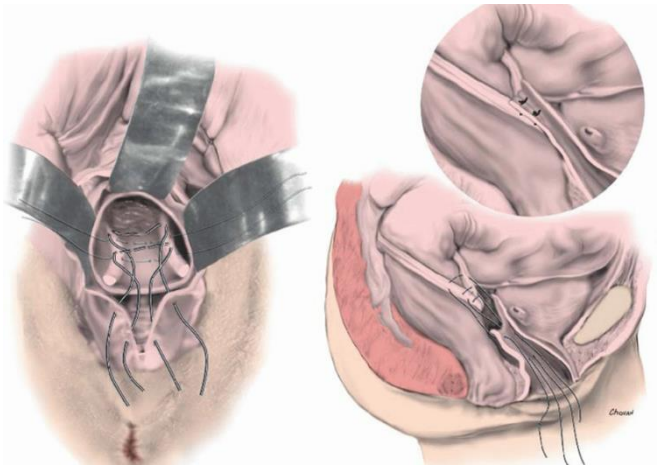


Fig: Placement of internal (nonabsorbable) and external (delayed absorbable) McCall sutures

Modified Burch colposuspension

INTRODUCTION

The Modified Burch colposuspension is a procedure to treat urinary incontinence due to pelvic floor relaxation. It is the preferred retropubic procedure for surgical treatment of stress urinary incontinence and hypermobile proximal urethra and bladder neck, especially in the setting of concomitant abdominal operation.

The procedure was developed by John Christopher Burch later modified by Tanagho. It works by preferential elevation and support of the bladder neck by the placement of sutures in the vagina near the urethra. This results in elevation of the hypermobile urethra back into an intra-abdominal position thus allowing normal pressure transmission

INDICATION

- Stress urinary incontinence
- Recurrence
- as a combination procedure for stress urinary incontinence and vaginal prolapse

CONTRAINDICATIONS

- Tendency to heavy bleeding (danger of bleeding in the retropubic space)
- Stress incontinence with a hypotonic urethra/ISD
- Predominance of urge incontinence

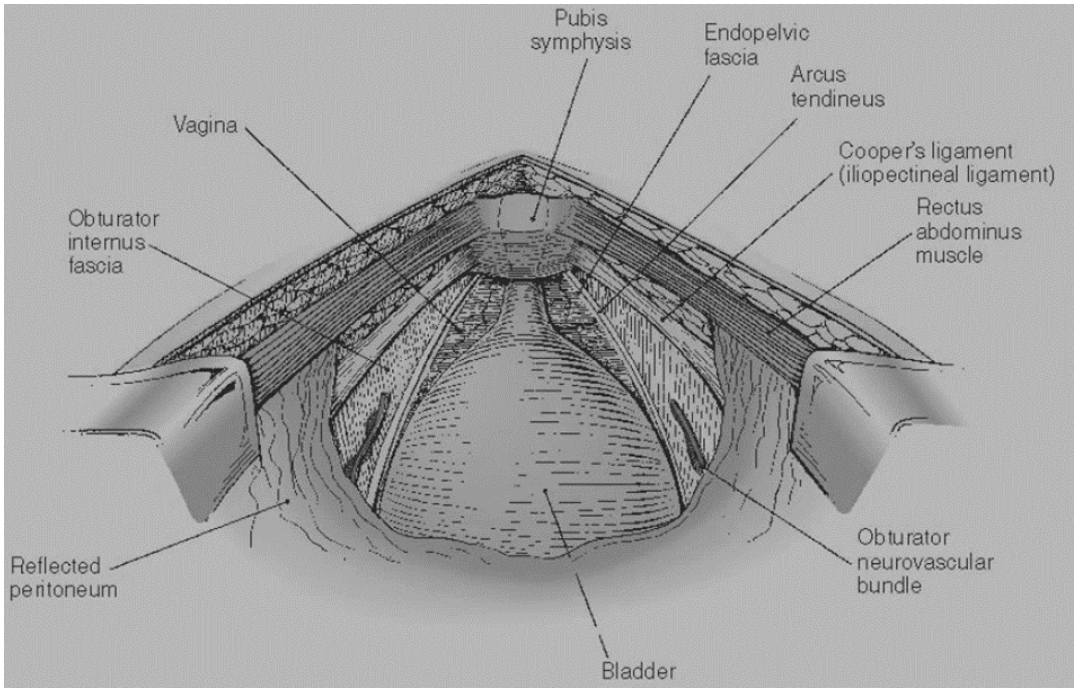


Fig: Anatomic landmarks in the space of Retzius

PREOPERATIVE EVALUATION

- Similar to other prolapse procedures

STEPS IN THE PROCEDURE

- Under spinal anesthesia, the patient is positioned Lithotomy position in Allen stirrups to access both the abdomen and vagina
- The bladder is drained with Foley catheter and will be kept in place
- Skin preparation and sterile draping for abdominal and vaginal approach
- A low transverse abdominal incision is created and the rectus muscles are laterally displaced
- The retropubic space is approached largely with blunt dissection technique with surgeon's finger from mid to lateral
- Identifying bladder neck with the surgeon's one hand in the vagina and using the Foley bulb as a guide

- By elevating vaginal wall lateral to the bladder neck with a vaginal finger, the fat tissue surrounding the neck of the bladder is removed with blunt dissection and bladder is mobilized medially and superiorly. Caution: danger of injury to the Santorini plexus, bleeding can be electrically coagulated or closed with sutures
- The pectineal (Cooper's) ligaments are freed by blunt dissection
- Two permanent braided sutures (Merseline, Dexone) are placed on either side of the bladder neck
- The proximal suture is placed approximately 2 cm lateral to the bladder wall at or slightly proximal to the level of the urethrovesical junction
- The distal suture is placed approximately 2 cm lateral to the proximal third of the urethra.
- One arm of each suture is placed through the ipsilateral Cooper ligament with insertion of needle into the ligament
- Sutures are tied such that two fingers easily fit between the pubic bone and the urethra so that the suture may be left hanging, to avoid overcorrection
- Cystoscopy is performed to exclude injury to the bladder and to verify ureteral patency.

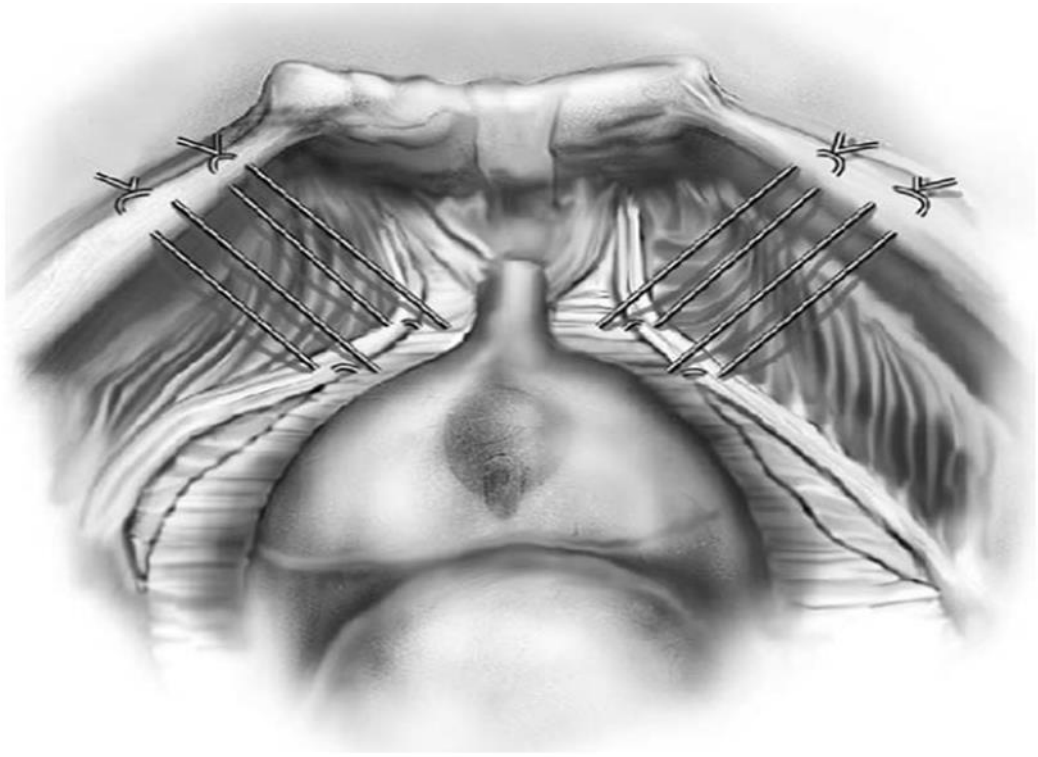


Fig: The Burch sutures are placed with each strand of the suture pair

POST-OPERATIVE CARE

- Routine post-operative cares
- Foley catheter remains in place for 24–48 hours
- Voiding and determination of the residual volume of urine after urination should be checked prior to discharge

COMPLICATION

- Hemorrhage
- Injuries to the bladder or urethra
- Disorders of bladder emptying
- Detrusor instability
- Recto- and enteroceles
- Failure -10- 20%

Tension free vaginal Tape

INTRODUCTION

Placement of tension-free vaginal tape is surgery to help control stress urinary incontinence. The goal of this procedure is to create a minimally invasive operation, which would reinforce the pubourethral ligaments, strengthen the support of the mid urethra by the anterior vaginal wall, and achieve conditions that would favor ingrowth of fresh connective tissue into the region

INDICATION

- Primary treatment of SUI with urethral hypermobility
- As a salvage operation in subjects who have failed previous SUI surgery and in the treatment of ISD

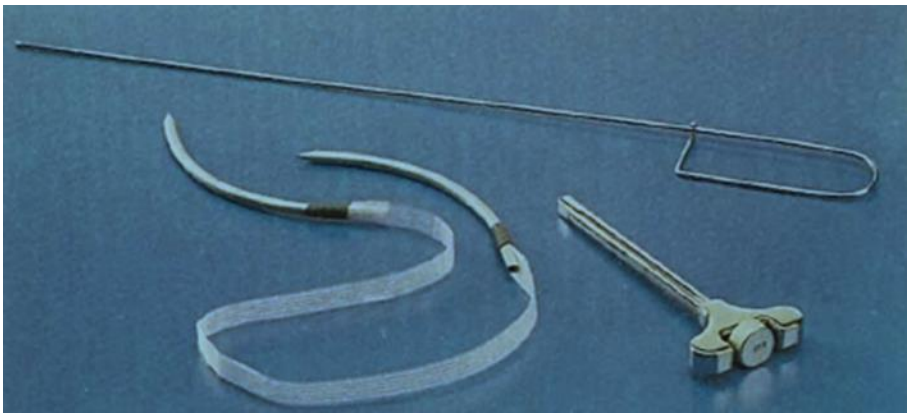


Fig: *Tension-free vaginal tape instrumentation, including (clockwise from top) a Foley catheter guide, needle introducer/handle, and specially designed needles/trocar attached to synthetic suburethral sling tapegoing through Cooper's ligament*

SURGICAL TECHNIQUE

The TVT is placed under the midurethra where the pubourethral ligaments are assumed to have their functional attachment

Steps in the procedure

- Type of anesthesia can be local or spinal anesthesia
- The patient is positioned in dorsal lithotomy position
- The bladder is drained and number 18 Foley Cather will be left in place
- The retropubic space will be injected generously with saline (or dilute local anesthetic) for hydro dissection both from the vaginal aspect (at site of incision and trocar insertion) and from the abdominal aspect (at the point where the tape emerges)
- An anterior vaginal wall incision (1.5 cm) is made over the midurethra, 1cm below external urethral meatus
- A tunnel is created under the vaginal wall sharp dissection with Metzenbaum scissors, oriented at 45 degrees (toward the inferior pubic ramus), for a distance of approximately 2 cm
- The bladder is deviated away to opposite side of trocar insertion with a catheter guide
- The insertion trocar is placed through the vaginal incision, it is guided to perforate into the retropubic space lateral to the urethra and bladder at the posterior wall of the symphysis. The skin is pierced immediately above the symphysis, about 2 cm lateral to the midline, directly or by means of small skin incisions

- Cystoscopy is performed with the trocar in place
- The trocar is pulled through the abdominal wall after verifying the trocars are away from the bladder
- After the same procedure is repeated on the contralateral side, the sling is tensioned with a spacer (such as a 9/10 Hegar dilator/ a Cooper Mayo scissor or their index finger) between the sling and the urethra.
- The plastic sheath is removed, the sling arms are trimmed at the skin, and the incisions are closed

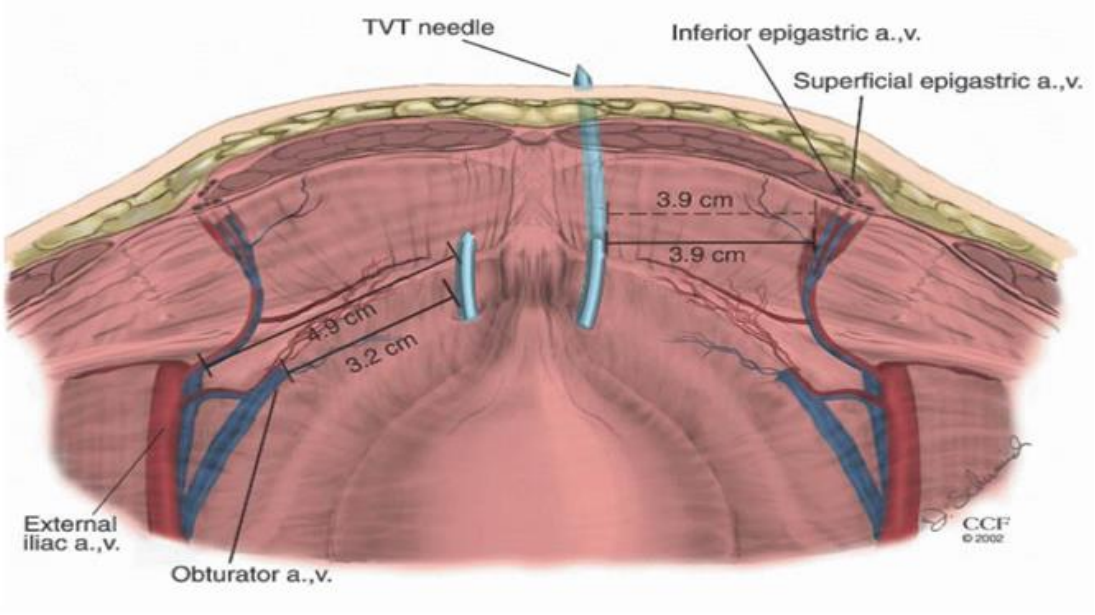
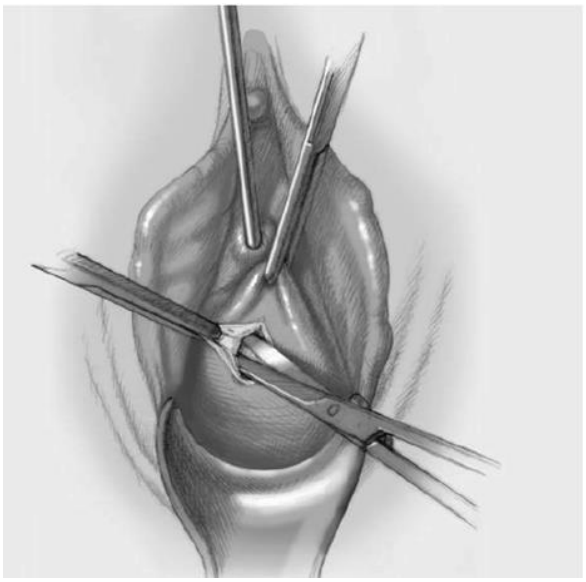
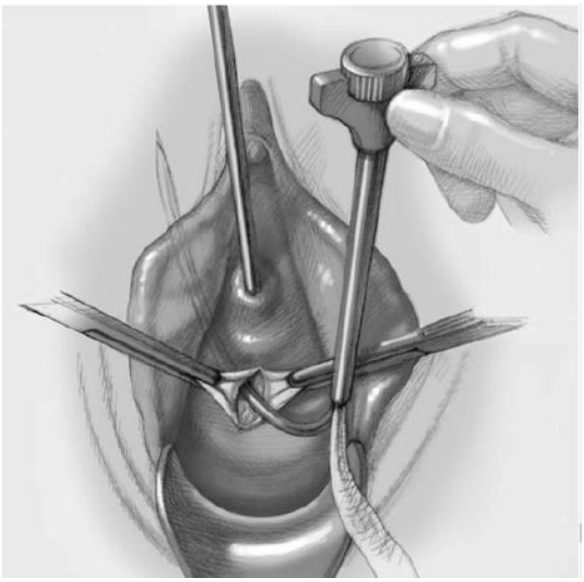


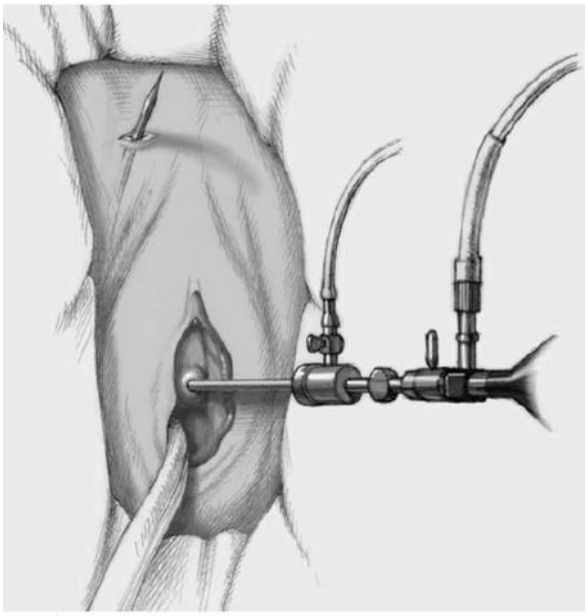
Fig: Retropubic trocars in the space of Retzius and their relation to surrounding vasculatures



The suturing channel is prepared



Introduction of the insertion trocar



Cystoscopy is performed to identify possible injuries and their relation to surrounding vasculatures

The trocar pulled through with polypropylene and their relation to

Fig: Application of tension free vaginal Tape

POST OPERATIVE CARE

- Routine post-operative care
- Foley catheter drainage
- Voiding trial by patient
- Checking the post void residual urine before discharge

COMPLICATIONS

- Injury to neighboring structures like bladder -2% to 4%;
- Persistent urinary retention requiring sling revision-2% to 3%
- De novo urinary urgency occurs in 10% to 12%
- Infection and erosion of the tape
- Hemorrhage due to vascular injury leading to retropubic space hematoma is rare and it is self-limited

FISTULA REPAIR

INTRODUCTION

Fistula is an abnormal communication between the urinary (ureters, bladder, and urethra) and the genital (uterus, cervix, and vagina) systems. The most common type of fistula is vesicovaginal fistula (VVF).

CLASSIFICATIONS OF VVF

Based on Site

- Juxta-urethral (could be circumfrencial)
- Mid vaginal
- Juxta-cervical

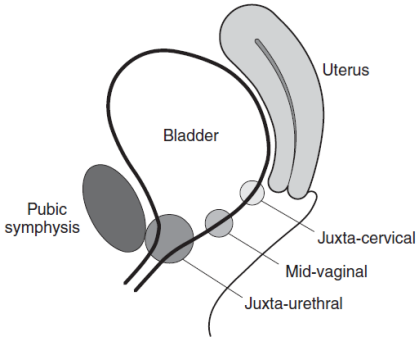


Fig: Different sites of VVF

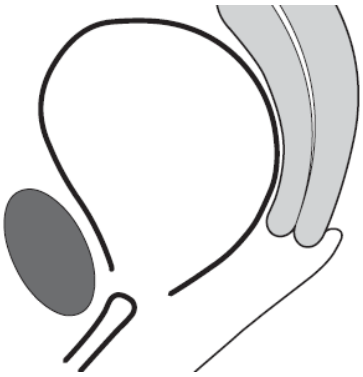


Fig: A circumferential juxta-urethral

Based on Fistula Size

- Tiny (admitting only a small probe)
- Small (0.5–1.5 cm)
- Medium (1.5–3 cm)
- large (>3 cm), usually involving loss of most of the anterior vaginal wall and a circumferential loss of the urethro-vesical junction
- Extensive, i.e. involving major loss of bladder and urethra, with a large gap between the two

Based on Degree of Anticipated Difficulty of the Repair

Defining Criteria	Simple	Complicated
Number of fistula	Single	Multiple
Site	Vesico-vaginal(VVF)	Recto-vaginal(RVF), Mixed VVF/RVF, involvement of cervix
Size/Diameter	<4cm	>4cm
Involvement of the urethra/ continence mechanism	Absent	Present
Scarring of vaginal tissue	Absent	Present
Presence of circumferential defect	Absent	Present
Degree of tissue loss	Minimal	Extensive
Ureter/Bladder involvement	Ureters are inside the bladder, not draining in to the vagina	Ureters are draining into the vagina, bladder may have stones

EVALUATION

- Direct visualization on necked eye during physical examination
- Digital palpation
- If direct visualization is not possible
    - Die test: using methylene blue or indigo carmine
- Dye flowing into the vagina demonstrates the fistula.
- *Three-swab test*
- Ureterovaginal fistula: - 2 cc of sterile methylene blue or indigo carmine is injected intravenously.
    - Intravenous urogram: compound fistulas
    - Cystourethroscopy
    - Voiding cystourethrography

INDICATION

- The fistula is located proximally in a narrow vagina
- A concomitant ureteric fistula is present
- The vaginal walls are rigid with little mobility
- Patients who are not candidates for conservative management (Those who present immediately after delivery with fistula or who have small fistula = (2 to 3 mm diameter) can be managed conservatively)

AIM OF SURGERY

- To close the fistula.
- To make the woman continent and able to resume a full and active life.

TIMING OF REPAIR

- wait a minimum of 3 to 6 months after the inciting event or the last attempt at repair

ROUTE:

- **Vaginal:** The usual approach
- **Abdominal:** transvesical

PREOPERATIVE PREPARATIONS

- Enemas are recommended for the repair of a recto-vaginal fistula (RVF).

SURGICAL PROCEDURE - FOR SIMPLE FISTULA

Anesthesia

- Spinal anaesthesia is the preferred method for all fistula cases
- Bupivacaine 0.5% in glucose is ideal as the longest-acting anaesthetic

Patient positioning

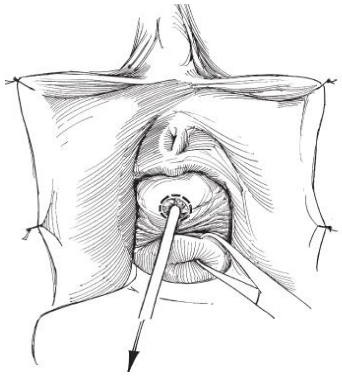
- Exaggerated lithotomy (steep Trendelenburg) position with shoulder supports for comfort and to help prevent the woman from sliding from the table
- The woman's legs should be placed outside the lithotomy poles or padded supports, and supported in the stirrups of the poles, with a small pillow placed under her head.

Fig: Exaggerated lithotomy position

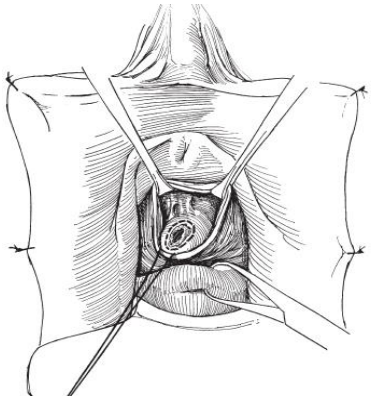
PROCEDURE

- Suture the labia laterally to improve access to the fistula
- Suture a swab to cover the anus
- Insert Auvard speculum
- Infiltrate the vaginal wall around the fistula margin with a mild haemostatic agent (1:200 000 adrenaline (epinephrine)) to reduce blood loss and assist dissection.
- Hold the vagina distal to the fistula with Allis clamp to bring the fistula into view
- The proximal margin of the fistula is incised, with the incision being made through the full thickness of the vaginal wall, but not into the bladder
- The incision is advanced onto the lateral walls of the vagina from the left and right angles of the fistula.
- A combination of sharp and blunt dissection is used to develop the plane between the bladder and the vagina.
- Tension should be maintained on both the bladder and vaginal walls during dissection.
- The dissection is extended laterally until the angles of the fistula are free.
- The dissection should be extensive enough to free the bladder off the vagina to enable a completely tension free closure of the bladder.
- Identify the ureters in all cases except for the very smallest fistulae.
- If the ureters are close to the fistula margin, they should be catheterized,

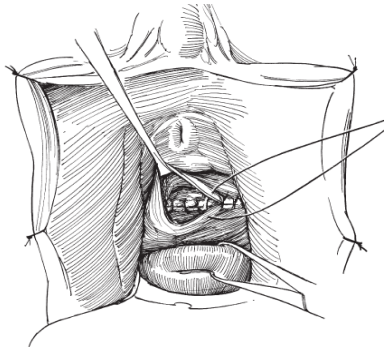
- The catheters are brought out through the urethra by pulling them through with a small curved artery forceps secured onto the mons pubis with a simple stitch.
- When there has been enough dissection to enable a tension free closure, the fistula edge is trimmed of any scar tissue or residual vaginal skin and then repaired with interrupted 00 absorbable sutures in single layer. The angles are secured first.
- It is very important to ensure that there is no protrusion of bladder mucosa at any point along the suture line.
- A dye test is performed to ensure sound closure of the bladder, and the suture line is checked for leaks
- Vaginal closure is performed with interrupted sutures.
- Pack the vagina at the end



Exposing fistula and making circumferential incision around the fistula



Dissection of the vaginal skin from the bladder



closure of the fistula after trimming the margins and closing the vaginal skin

Fig: VVF repair

POST-OPERATIVE CARE

Immediate

- The vital signs (blood pressure, pulse and temperature) should be regularly observed and recorded
- Observe for excessive blood loss both vaginally and through the catheter.
- Intravenous fluids should be given until fluids can be taken orally
- The fluid balance should be regularly monitored, including both fluid input and output
- The woman should be kept comfortable with adequate analgesia
- The woman should be mobilized as soon as possible if she has had a simple repair.

After 24 hours

- The woman should be encouraged to maintain a high oral-fluid intake level to enable her to produce two to three liters of urine per 24 hours.
- The vaginal pack, if used, should be removed within 24 to 72 hours
- Catheter to enable free drainage should be retained for 10–14 days.
- Ensure that neither the drainage tube nor urinary catheter becomes kinked, and that the drainage receptacle is always at a lower level than the bladder.
- Ambulation, Physiotherapy when required
- Avoid coitus for 3months.
- Pregnancy after 6-12 months.

Urethral Diverticulum (UD)

DEFINITION

Cystic enlargement of a paraurethral gland, which is found in the anterior vaginal wall and communicates directly with the urethra with a single discrete connection, termed the neck or ostia.

CLINICAL PRESENTATION

- Commonly asymptomatic and frequently diagnosed incidentally on routine examination
- Clinical symptoms include asymptomatic recurrent urinary tract infection, vaginal mass, dyspareunia, incontinence, postmicturition dribbling, dysuria, hematuria, frequency, urgency and pain

- Patients may also present with a tender anterior vaginal wall mass, which upon gentle compression may reveal retained urine or purulent discharge per the urethral meatus.

INDICATION FOR SURGERY

- persistent and troublesome symptoms

DIAGNOSTIC INVESTIGATIONS

- Urine culture and analysis
- Cystourethroscopy
- Imaging: Ultrasound, MRI, Double-balloon positive-pressure urethrography (PPU)

TRANSVAGINAL URETHRAL DIVERTICULECTOMY

- The anterior vaginal wall and the periurethral fascia is dissected off, exposing the urethral diverticulum.
- Total excision of a proximal diverticulum - include the neck of the diverticulum and the urethral ostium
- Accompanied by urethroplasty of the defect in the urethra
- The urethral diverticulum is closed with nonoverlapping suture lines.
- The vaginal wall is closed.

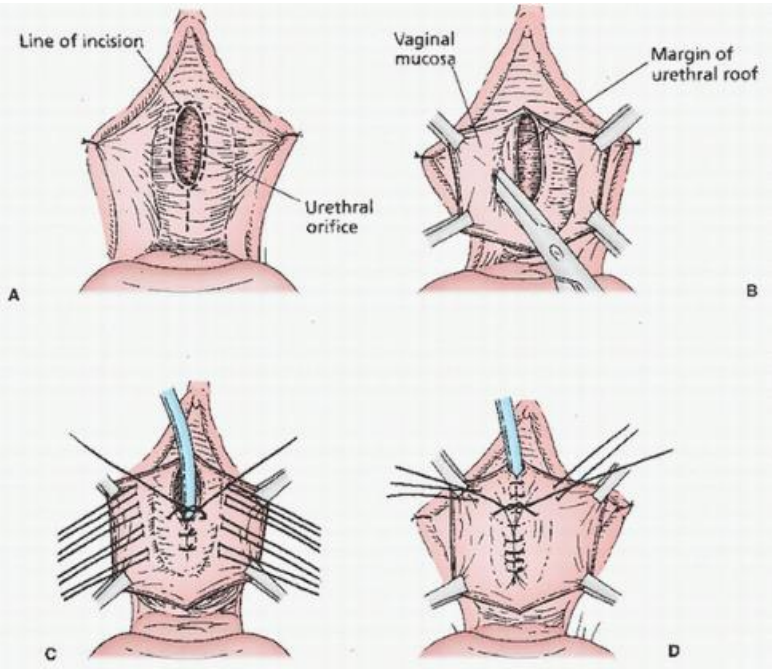


Fig: TRANSVAGINAL URETHRAL DIVERTICULECTOMY

ANTERIOR DIVERTICULECTOMY

Anteriorly located diverticula is difficult to excise because of difficult access. Techniques:

1. Lateral approach
2. End-to-end urethroplasty and the use of the anterior bladder wall as a reconstruction flap.

MARSUPIALIZATION

- Incising the diverticulum and suturing the wall of the cavity to the surrounding vaginal tissue in an interrupted fashion.
- Considered in distal diverticulum beyond the point of maximal urethral closure pressure.

PROCEDURES FOR GYNECOLOGY-ONCOLOGY

Cervical Cryotheraphy

INTRODUCTION

Cryotherapy is a procedure that eliminates precancerous lesions on the cervix by freezing them. It involves applying a highly cooled metal disc (cryotip or cryoprobe) to the cervix and freezing its surface using carbon dioxide gas or nitrous oxide gas as the coolant. This procedure does not require anesthesia

INDICATION

- premalignant cervical lesion

CONTRAINDICATION

- Unsatisfactory colposcopy
- Lesion not fully visible or extending beyond the range of the cryotherapy probe
- Colposcopically directed biopsy not consistent with cytology
- ECC positive for CIN
- Biopsy consistent with or suspicious for invasive carcinoma
- Glandular epithelial dysplasia or adenocarcinoma in situ

"DOUBLE-FREEZE" CRYOTHERAPY STEPS

- Tell woman that speculum is about to be inserted.
- Gently insert speculum.
- When entire cervix can be seen, fix blades of speculum.
- Move light source to see cervix clearly.
- Use a cotton swab to remove any discharge, blood or mucus from the cervix. Identify cervical os, SCJ and lesion, repeat VIA.
- Point cryoprobe at ceiling. Press freeze button for 1 second and defrost button for 1 second.
- Screw cryotip on cryoprobe.
- Apply tip of cryoprobe to cervix, ensuring that nipple is centered and placed squarely onto os.

- Set timer for 3 minutes and press the freeze button.
- After 3 minutes, wait for tip to detach from cervix.
- Wait 5 minutes and repeat procedure.
- Use double freeze technique (3 minutes freezing – 5 minutes rest (defreeze) – and another 3 minute freezing).
- Close master cylinder valve.
- Inspect cervix for bleeding.
- Remove speculum and place in 0.5% chlorine solution.

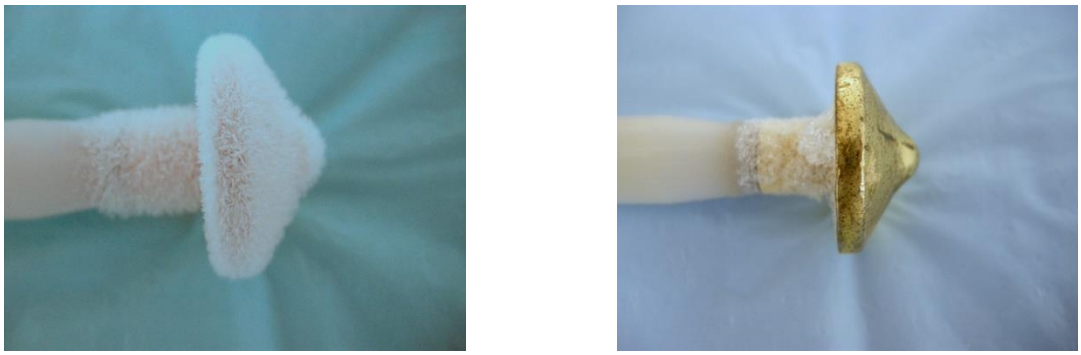
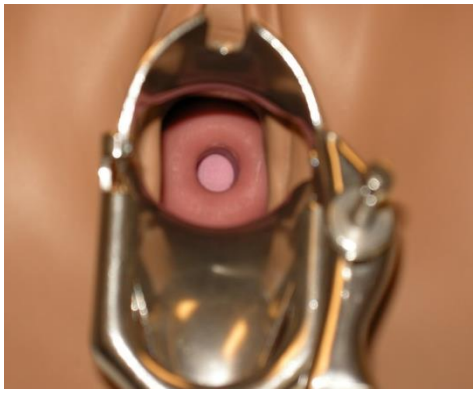
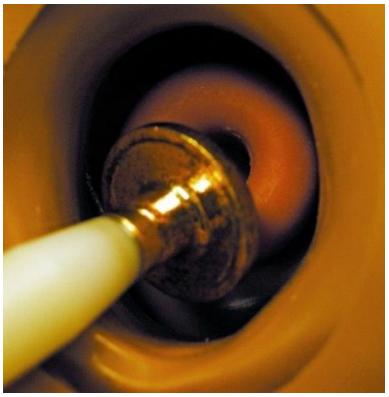


Fig: Cryoprobe



Speculum insertion and visualization of the cervix



Applying tip of cryoprobe to cervix

POSTPROCEDURE CARE

- Inform the patient that vaginal discharge for 2-4 weeks is expected which is evidence of cells sloughing from the cervix.
- Do not use tampons or have sexual intercourse for 4 weeks after treatment
- Ibuprofen or paracetamol for pain relief.

Loop Electrosurgical Excision Procedure (LEEP)

INTRODUCTION

The treatment of high-grade cervical dysplasia has traditionally been by cervical conization (also known as cone biopsy). Cervical conization is defined as the excision of a cone-shaped portion of the cervix surrounding the endocervical canal, which includes the entire transformation zone

PREPROCEDURE PREPARATION

Anesthesia

- Using a 25-gauge to 27-gauge needle a vasoconstricting solution with local anesthetic is injected circumferentially 1 cm deep into the cervix outside the area to be excised.
- The cervix should blanch postinjection.

Positioning

- The patient is placed in dorsal lithotomy position, and the grounding pad is placed on the upper thigh.

PROCEDURE

- The patient is placed in dorsal lithotomy position and an insulated speculum, with the smoke evacuation tube placed in the vagina to gain visualization of the cervix.
- The cervix is infiltrated with an anesthetic/vasoconstrictor solution.
- Acetic acid (3-5%) or Lugol's solution is placed on the cervix to visualize the entire lesion and aid the surgeon in the proper selection of loop electrode.
- The electrosurgical generator is set at 30-50 watts on blend 1.
- Ideally the lesion is excised in one pass. The loop should be carefully passed simultaneously around and under the transformation zone.
- The entire transformation zone should be excised to a depth of 5-8 mm. For best results, the loop should glide through the cervix.

- If the loop moves too slowly, excess thermal damage occurs. If the loop is pulled too rapidly through the cervix, it will drag, bend, or adhere to the tissue, resulting in too shallow of a specimen.
- In patients with wide lesions or large cervices, making additional passes in order to completely remove all disease may be necessary.
- If the lesion extends into the endocervical canal deeper than 5-8 mm depth, additional tissue is excised with a smaller rectangular loop (“top hat”).
- Bleeding is usually easily controlled with a Ball electrode.

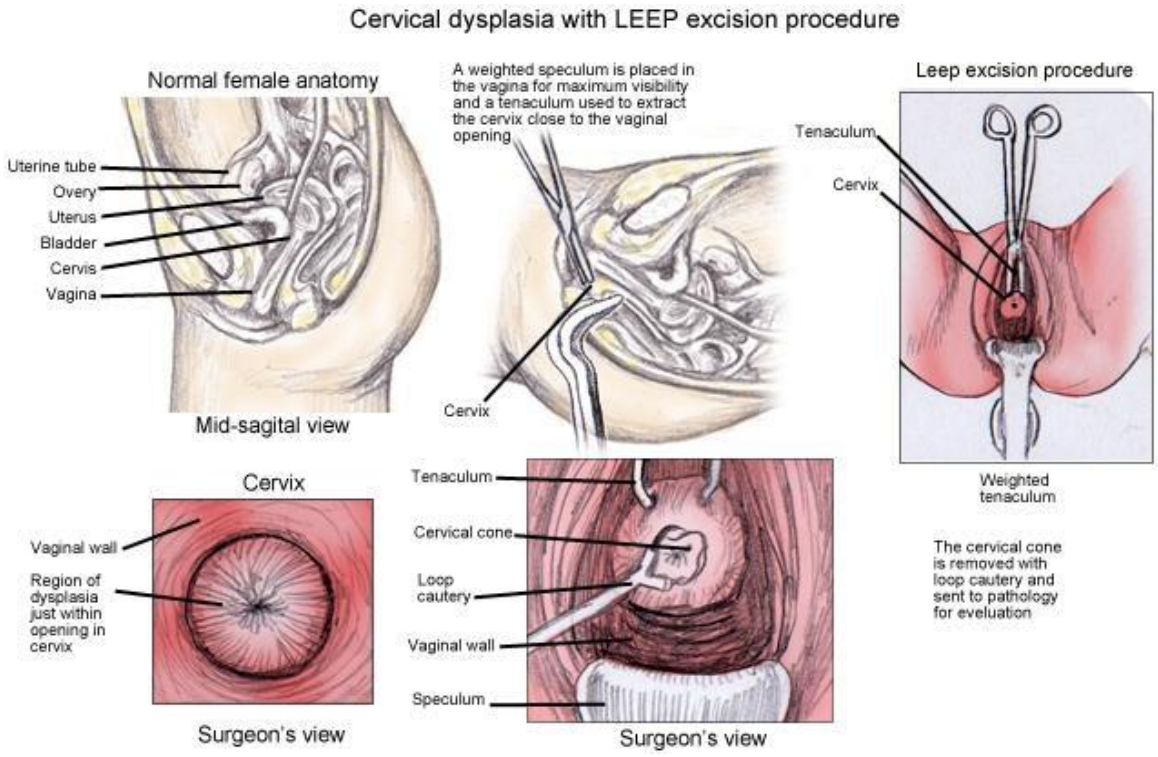


Fig. Excision procedure.

COMPLICATION

- Intraoperative bleeding
- Postoperative bleeding
- Infection
- Cervical stenosis and cervical insufficiency

Abdominal Radical Hysterectomy (RH)

DEFINITION

RH is a hysterectomy where dissection of the ureters from within the parametria and a wider resection of additional tissue surrounding the cervix is performed.

INDICATION:

- Early stage cervical cancer: up to stage IIA cervical cancer
- FIGO Stage II endometrial cancer

PREOPERATIVE CONSIDERATION

- CBC
- Organ function tests
- EKG for women older than 50
- Clinical staging of the cervical cancer
- first generation cephalosporin for prophylactic antibiotic 30 minute before skin incision
- thromboembolic prophylaxis: subcutaneous heparin 5000IU prior to surgery
- central venous access and preparation of cross matched blood
- ***Anesthesia:*** General anesthesia

SURGICAL TECHNIQUE

- *Positioning:* place the patient in supine position and prepare the abdomen and vaginal canal. Catheterize the bladder with a Foley catheter.
- After the patient is positioned Examination under anesthesia (EUA) is performed to assess the cervical mass, the vagina and the parametrium.

Step1: Entry into the abdominal cavity and exposure

- **Abdominal incision:** Make a vertical midline incision 3 cm above the umbilicus and extend the incision inferiorly to the pubic symphysis.

- After abdominal entry and placement of a self-retaining retractor, release adhesions to have a normal anatomy (if any adhesion exists). Pack the bowel using warm and moist laparotomy towels into the upper abdomen.
- Explore the whole abdominal cavity for any metastasis; palpate for extension of the tumor to the pelvic side wall; palpate for any enlarged pelvic and paraaortic lymph nodes.
- Elevate the uterus by placing a Straight clamps across the broad ligament adjacent to the uterine fundus incorporating the round ligament, fallopian tube, and utero-ovarian ligament on each side.
- Before proceeding with the RH the urinary bladder need to be mobilized downward from the lower uterine segment, the cervix and the upper part of vagina. If the mobilization of the bladder is not possible then the surgery should be abandoned at this stage.

Step 2: Development of the avascular spaces

- Clamp, cut and ligate the round ligament as far laterally toward the pelvic sidewall as possible and held long for traction.

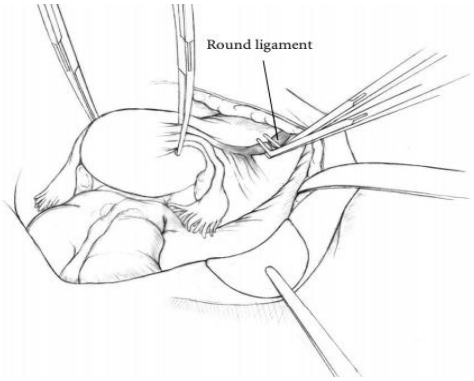


Fig: Clamp, cut and ligate the round ligament

- Incise the anterior leaf of the broad ligament inferiorly along the lateral pelvic wall for a distance of 3 cm.
- Incise the posterior leaf of the broad ligament parallel to the infundibulopelvic ligament.

Development of the Pararectal space

- Carefully dissect with Kelly clamp or dissector between the hypogastric artery (laterally) and the medial leaf of the broad ligament peritoneum to develop the pararectal space. The ureter which is attached to the medial leaf of the broad ligament peritoneum should be

dissected from its adventitial sheath using a right angle clamp and placed within a vessel loop for traction.

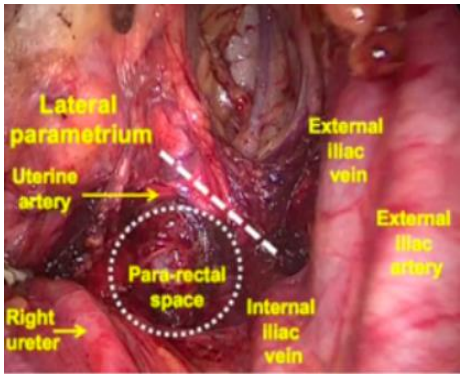


Fig: Pararectal space

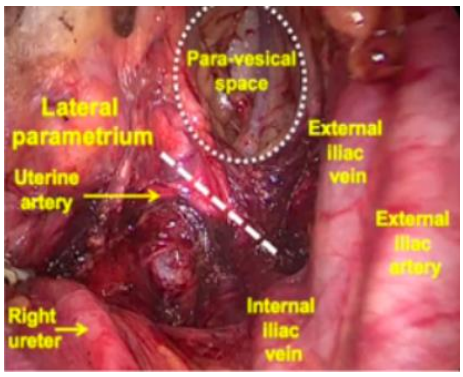


Fig: Paravesical space

Table: BOUNDARIES FOR THE PARARECTAL SPACE	
Medially	rectum
Laterally	the posterior division of the hypogastric artery
Anteriorly	Lateral parametrium and the uterine artery
Posteriorly	The sacrum
Floor	Endopelvic fascia (Pelvic floor)

Development of the paravesical space

- Place an upward traction on the round ligament ligature and the lateral surface of the bladder with a Babcock clamp , this will expose the obliterated umbilical artery which appear as a thick band of tissue running just lateral to the bladder, and it demarcates the medial border of the paravesical space .
- developed the space with a finger or long Kelly clamp starting along the pelvic sidewall anterior to the cardinal ligament and dissecting anteriorly, medially, and inferiorly.

Table: BOUNDARIES FOR THE PARAVESICAL SPACE	
Medially	bladder and vagina
Laterally	external iliac vessels
Anteriorly	Superior pubic rami
Posteriorly	lateral parametrium
Floor	Endopelvic fascia (Pelvic floor)

Step 3: Ligation of the uterine artery

- Identify the anterior division of the internal iliac artery and isolate the uterine artery. Skeletonize the uterine artery using a dissector and then doubly ligate it with 2-0 silk ties, and transect. The superior vesical artery should be preserved.

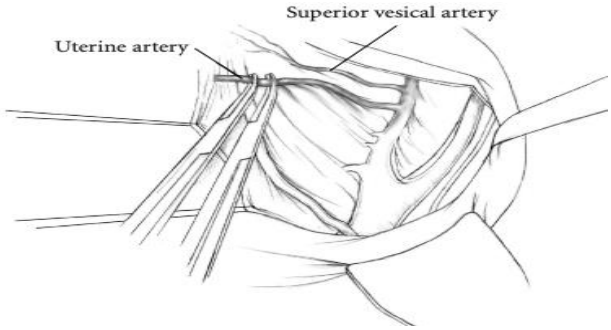


Fig: Ligation of the uterine artery

Step 4: Dissection of the ureters

- Place the posterior leaf of the broad ligament on medial traction and dissect the ureters from their attachments to the lateral side of the uterosacral ligaments using a right angle clamp to gently develop the correct plane outside the adventitial sheath.
- Completely mobilize the ureter from the medial leaf of the broad ligament peritoneum from the level of the pelvic brim down to its entrance into the ureteric tunnel.

- Grasp the bladder at the edge of the vesicouterine peritoneal incision and make a ventral and caudal traction. Further develop the vesicouterine space to expose the proximal 3 to 4 cm of vagina.
- Divide the vesicocervical ligament and mobilize the bladder off of the proximal vagina.
- Apply traction on the ureter using the vessel-loop and dissect it from its attachment within the ureteric canal. Deroof the ureteric canal by introducing a right angle clamp along the superior and medial border of the ureter and gently spreading the tips of the clamp multiple times in step wise fashion. Use clamps to divide the vesicouterine ligament and ligate with 2-0 or 3-0 delayed absorbable sutures

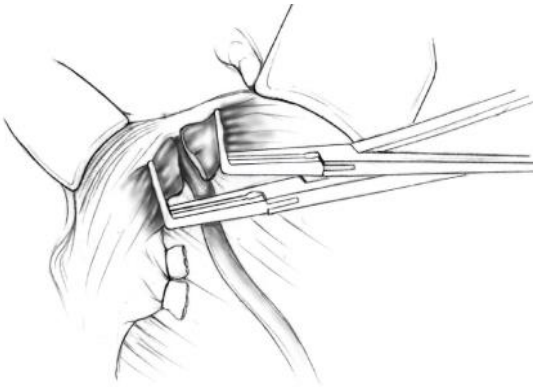


Fig: Dissection of the ureters

Step 4: Parametrectomy

- Place the rectosigmoid colon on dorsal traction and incise the peritoneum over the posterior cul-de-sac to develop the rectovaginal space.
- Incise the medial leaf of the broad ligament down to the base of the uterosacral ligament at the level of the rectum.
- Mobilize the rectum caudally for a distance of 3 to 4 cm.
- Clamp, divide and ligate the uterosacral ligaments close to the rectum

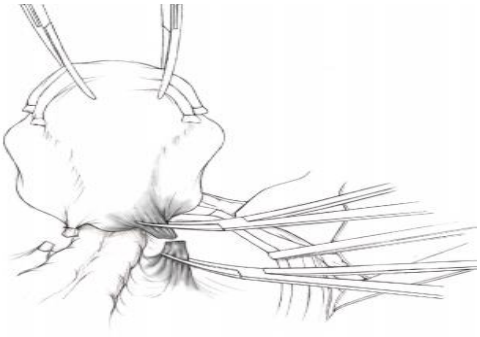


Fig: Parametrectomy

- Clamp, divide and ligate the cardinal ligament at the level of the pelvic side wall.
- Place a clamp across the paravaginal tissue (paracolpos) in such a way that the heel of the clamp is contrasted to the pelvic wall and the tip of the clamp approximates the lateral vaginal wall 2 to 3 cm below the cervicovaginal junction or lowermost extent of palpable tumor.
- Create an anterior colpotomy using the electrosurgical unit or scissors. Resect the vagina circumferentially using a series of bites. Close the vaginal cuff in a continuous fashion using 1-0 delayed absorbable sutures.

NB: Depending on the age of the patient and the histology of the disease there could be a need for oophorectomy. Refer to the specific chapter on how to perform this step.

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