DC Dutta’s

Textbook of

Gynecology

including Contraception

Seventh Edition

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Dutta’s Textbook of Gynecology (7/e) has been updated with all of the significant changes that have happened in the field over the last 10 years. It has been beautifully illustrated and will be extremely useful for both undergraduate and the early postgraduate years of training. Uniformly, the operative descriptions and illustrations of surgical procedures are of first class and will be beneficial for a trainee at the start of their surgical career.

The book commences with excellent review of the anatomy of the female pelvic organs along with human embryology. The chapter progresses through puberty through the reproductive years and then physiology of the menopause. There are excellent sections on infections, abnormal uterine bleeding, subfertility and malignancies of the genital tract. Chapter 25 looks at uroynaecology and covers all the ranges of treatment available. Mid urethral tape procedure need to be emphasized as the treatment of choice. However, availability of the tape is an essential requirement for the procedure.

I found that the chapter on displacement of the uterus is interesting and useful. I feel this part can be further concise as there is no need of surgical management though the place of pessary may be there.

The remainder of the chapter deals very well with both the diagnosis and management of utero-vaginal prolapse.

There is an excellent chapter that covers special topics and includes unusual symptoms from galactorrhoea, breast lumps and residual ovarian syndrome. Lastly, I really liked the section on practical gynecology, which includes photographs and names of all standard surgical instruments something, which is often not properly understood. This is then followed by a variety of histology specimens, which have a question answer self-assessment attached.

An inclusive DVD compliments the book with instructions on total abdominal hysterectomy. However I would recommend that this DVD should be compatible with all other operating systems.

Dr. Paul P Fogarty
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Senior Vice President Royal College of Obstetricians & Gynaecologists, London
How this Book is Useful?

Features

• Expanded in size for better readability.
• Thoroughly revised and updated in an easy-to-read format.
• Use of different color codes to highlight core knowledge (Must-Know Areas).
• New topics on Imaging Techniques in Gynecology (Chapter 10)
• New topics on Psychosexual Issues and Female Sexuality (Chapter 34) have been incorporated.
• Pelvic Organ Prolapse (Chapter 16) has been rewritten, based on the latest concept of pelvic anatomy and the new concepts of repair.
• Premalignant Lesions (Chapter 23) and Genital Malignancy (Chapter 24) have been exhaustively updated, based upon the current knowledge and recommendation.
• The Chapter 36 on Endoscopic Surgery in Gynecology (Laparoscopic, Robotic and Hysteroscopic) has been rewritten as it has gained much popularity in clinical practice these days.
• More emphasis has been given on case selection (indication), principal steps of operation and complications.
• Practical Gynecology (Chapter 38) with high-quality colored illustrations and self assessment questionnaire for the development of clinical and practical competence.

This book is being read by almost all the undergraduates and postgraduates of our Institute and is in the recommended list of textbooks. For the faculty it is being very useful for a quick refresh guide just prior to taking class.
The present edition is very attractive in color and printing style and easy to read for the older generations as well as it does not give any eye strain.
All the chapters are updated incorporating latest etiological classifications of all the diseases and their management.
The chapters on Anatomy, Development and Congenital Malformations of Genital Tract are made so easy with the illustrations and incorporation of applied anatomy and clinical application.
The chapters on Malignancies and Radiotherapy, Chemotherapy, Immunotherapy are made very simple without compromising the essential knowledge even for the beginner.
The chapters on infections, contraception and Infertility are presented well with the information for the student to grasp and reproduce easily.
Chapters on special topics, such as operative gynecology, endoscopic surgery and practical Gynecology which includes instruments and specimens is a boon for exam going students as they do not require to refer any other book to get great scores.
I am very much impressed with the presentation of must know areas of the subject in many tabular columns and one can capture straight the specific point one wants to know easily without wasting anytime.
I am honored to write the comments

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Preface to the Seventh Edition

Dutta’s Textbook of Gynecology was first published in 1989. Over the years, it has been firmly established amongst the medical fraternity. Each area of gynecology has evolved substantially due to concurrent progress in science, technology and imaging. To fulfill the need of our readers, this edition has undergone extensive revision in the light of current wealth of knowledge. Each chapter of this book is authoritative. Consistency and uniformity with updated information in all the chapters are a special feature of this book.

Dutta’s Textbook of Gynecology has endured because over the years it has evolved to provide comprehensive updated information in a concise and easy-to-read format. It has skillfully integrated the preclinical science and the clinical gynecology from the very outset. With this edition, each chapter has been thoroughly revised and updated to ensure that it reflects the cutting edge of medical knowledge and practice. It is prepared to meet the needs of the candidates for their examination at national and international levels. The edition has been made more user-friendly in terms of updated text matters, graphics, design and use of different color codes. Color codes help to highlight the core knowledge (must-know area). This book provides profuse illustrations, high-quality photographs, anatomical drawing and imaging studies. This textbook has been enriched with tables, diagrams, boxes, charts and algorithms, which could be studied and reproduced easily. Key points at the end of each chapter are for quick and easy revision. The state-of-the-art in this book lies in the presentation, which is simple, lucid, clear and concise. Above all, it provides a balanced distillation of evidence-based information upon which a student, a trainee resident, a practitioner and a nurse can fully depend.

All the chapters have been exhaustively revised, updated and few thoroughly rewritten. New topics on Imaging Techniques in Gynecology (Chapter 10) and Psychosexual Issues and Female Sexuality (Chapter 34) have been incorporated. Pelvic Organ Prolapse (Chapter 16) has been rewritten, based on the latest concept of pelvic anatomy and the new concepts of repair. Premalignant Lesions (Chapter 23) and Genital Malignancy (Chapter 24) have been exhaustively updated, based upon the current knowledge and recommendation. Operative Gynecology (Chapter 35) is meant to provide the basic principles of commonly performed gynecological surgery so as to guide an apprentice. More emphasis has been given on case selection (indication), principal steps of operation and complications. The chapter on Endoscopic Surgery in Gynecology (Laparoscopic, Robotic and Hysteroscopic) (Chapter 36) has been rewritten as it has gained much popularity in critical practice these days.

Practical Gynecology (Chapter 38) contains a huge number of high-quality photographs and plates of imaging studies. Hundreds of examination-oriented questions along with their answers and explanations are presented. This chapter is designed to help the students in their preparation for the clinical and viva-voce part of the examination. The self-assessment questionnaire having an objective structured clinical examinations (OSCEs) format is to improve the clinical competence of the students. The total information given in Chapter 38, amounts to a ‘mini-textbook-cum-color atlas’ of gynecology.

More than 450 high-quality colored photographs and illustrations have been incorporated. Considering the vast amount of scientific information and the research, it is practically impossible to limit the subject matter within the few pages of this book. Arrangements have been made through the electronic media (website, email) for the readers who wish to know more. Information regarding the examination situation (theory, viva-voce, multiple-choice questions and answers, clinical examination methods and operation video clips) has been provided through these electronic resources (www.dcdutta.com/www.hiralalkonar.com).

My aim in this book has always been to help the students, residents and the clinicians to remain updated with the knowledge that has passed the test of clinical relevance.

I do hope this comprehensive textbook will continue to be an immense educational resource to the readers as ever. According to the author’s desire, the book, is therefore, dedicated once again to the students of gynecology—past and present.

Hiralal Konar
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SPATULA AND CYTOBRUSH (FIG. 38.1)

Ayre’s spatula (wooden or plastic) and the endocervical brush are used for collection of cells for cytology screening.

Procedure

- **For cervical cells:** Projected end of the spatula goes within the external os. The spatula is rotated 360° to collect cells from the entire ectocervix (see Fig. 9.18).
- **For endocervical cells:** The cytobrush goes within the cervical canal and is rotated to collect cells (see Fig. 9.18).
- **For cytohormonal study (see p. 89),** the rounded end of the spatula is used (see Fig. 9.18).

Self-assessment

Q. How do you prepare the slide?

Ans. The material so collected is immediately spread over a slide. Fixative (95% ethyl alcohol) is spread over it. Once dried up, the slide is then stained (in the laboratory) either with Papanicolaou or Sorr’s method. It is examined under the microscope by a cytopathologist.

Q. Who are the women (at risk), that they need cervical cytology screening?

Ans. • Any sexually active women over 21 years and up to 70 years of age.
   • Others: (see p. 89).

Q. What is the grading of Papanicolaou’s smear?

Ans. Gradings are total five: (a) Normal, (b) Infective, (c) Suspicious, (d) Few malignant cells, and (e) Plenty of malignant cells (see p. 91).

Q. What is a dyskaryotic smear? What are the different types of dyskaryotic smear?

Ans. Dyskaryosis is the morphological abnormalities of the nucleus. Abnormalities may be nuclear enlargement in size and shape, irregularity in outline, multinucleation, and hyperchromasia. Dyskaryotic smear may be: (i) Mild, (ii) Moderate, and (iii) Severe (see p. 90).

Q. What is Koilocytosis?

Ans. It is the nuclear abnormalities observed in human papilloma virus (HPV) infection. The typical changes are: Perinuclear halo, nuclear irregularity, hyperchromasia and multinucleation (see Fig. 23.4).
**Q. What is CIN? How do you diagnose CIN?**

**Ans.** It is the histological observation where part or whole of thickness of cervical squamous epithelium is replaced by cells with varying degree of atypia. Basement membrane remains intact. Diagnosis of CIN is made by: (i) Cytology, (ii) VIA, (iii) Colposcopy, (iv) Cervicography, (v) Biopsy, and (vi) Conization of cervix (see p. 487).

**Q. How do you manage a case of CIN?**

**Ans.** (a) Local ablative methods. (b) Excisional methods (LLETZ) or by (c) Hysterectomy.

**Q. What is the Bethesda System classification for cervical cytology?**

**Ans.** See p. 91 (Table 9.3)

**Q. How to take cervical smear?**

**Ans.** Cervix is exposed with a Cusco's bivalve speculum without any lubricant. Prior bimanual examination should not be done. Rest see p. 89, 90.

**Q. How HPV infection and CIN are related and how it could be prevented?**

**Ans.** See p. 265.

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**SIMS’ DOUBLE BLADED POSTERIOR VAGINAL SPECULUM (FIG. 38.2)**

**Description and Identification**

This is a metallic instrument.

The instrument was designed by Marion Sim’s see (Dutta’s Bedside clinic p. 474). The blades are of unequal breadth to facilitate introduction into the vagina depending upon the space available (narrow blade in nulliparous and the wider blade in parous women). This double bladed speculum has a groove in the handle (located in between the blades). This groove is in continuity at either end, with the concave inner surface of each blade. The purpose of the groove is to allow drainage of blood, urine (in a case of VVF), or secretions to collect samples and for tests.

**Uses**

- It is commonly used in vaginal operations such as D&C, D&E, anterior colporrhaphy, vaginal hysterectomy, etc. to retract the posterior vaginal wall.
- To visualize the cervix and inspect the abnormalities in the anterior vaginal wall like cystocele, VVF or Gartner’s cyst after placing the patient in Sims’ position.
- To collect the materials from the vaginal pool for cytology, Gram stain or culture.

**Sterilization**

Boiling or autoclaving.

**Self-assessment**

- Who was Marion Sims’?
- Sims’ position (see p. 84 Fig. 9.3A).
- Sims’ triad (see p. 347).
- Introduction of Sims’ speculum (see p. 84).
- Why the blades are of unequal sizes?
- Abnormalities in the anterior vaginal wall.
- Indications of D&C (see p. 484).
- Steps of D&C (see p. 485).

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**CUSCO’S BIVALVE SELF-RETAINING VAGINAL SPECULUM (FIG. 38.3)**

**Description and Identification**

It is a metallic (could be plastic also) instrument. It has two blades joined by screws that allow the blades to open and close around a transverse axis. The blades are concave inside. The handle is designed to open and close the blades and to adjust the space with the blades with a separate rod and screw system. This also makes the blades self-retaining during examination. This speculum does not need any assistant to hold it.

The blades are opened to retract the anterior and posterior vaginal wall so as to have a good look to the cervix. A light source from behind is essential. **It is commonly used in the OPD.**

**Fig. 38.3: Cusco’s speculum**
Lesions in the cervix (see p. 136, 219).
Ectopy (erosion) cervix (see p. 217)
Bethesda system cytology reporting (see p. 91).
Polyps (see p. 231).

Q. What is cervical ectopy?
Ans. It is the replacement of squamous epithelium of the ectocervix by columnar epithelium of endocervix by the process of metaplasia (see p. 217).

Q. What are the different types of polyps?
Ans. Polyps may be benign (mucous, fibroid or placental) or malignant. It may be sessile or pedunculated (see p. 231).

**AUVARD’S SELF-RETAINING POSTERIOR VAGINAL SPECULUM (FIG. 38.4)**

**Description and Identification**
It is a metallic instrument. It is made heavy as a ball with lead is attached with it. The handle is longer. The upper surface of the blade is concave. In continuity to this concavity there is a groove that runs all along the handle. This is to drain out any blood that is collected on the upper surface of the blade. The blade has two small holes, two on each side. Labial stitches can be placed through the holes to prevent it slipping down.

**Uses**
- It is used as posterior vaginal wall retractors in operations like anterior colporrhaphy, vaginal hysterectomy, etc.
- It should be used when the operation is done under general or regional anesthesia as the instrument is heavy. It requires no assistant. **Disadvantage:** It is heavy. Prolonged use may cause perineal pain in the postoperative period.

**Sterilization**
Autoclaving or boiling.

**FEMALE RUBBER CATHETER (FIG. 38.5)**

**Description and Identification**
It is made of red rubber. There is an opening close to its tip to drain urine from the bladder. It is made of different sizes.

**Uses**
- To empty the bladder in retention of urine.
- To administer oxygen (where nasal probes not available).
- To use as a tourniquet in myomectomy operation as an alternative to myomectomy clamp.

**Sterilization**
Boiling.

**Self-assessment**
- Causes of retention of urine (see p. 338 Table 25.7).
- Procedure of catheterization (see p. 88).

Q. What are the causes of acute and chronic retention of urine?
Q. What are the different types of urinary incontinence?
Ans. See page 328, 329.

Q. What are the different menstrual abnormalities that can manifest with retention of urine? (See p. 338, Table 25.7).
Ans.

i. **Primary amenorrhea** (cryptomenorrhea) → hematocolpos (see p. 371) → retention.

ii. **Secondary amenorrhea** → retroverted gravid uterus (see p. 338) → urinary retention.

iii. **Menorrhagia** → impacted uterine fibroid in the POD (see p. 227) → urinary retention.

iv. **Irregular bleeding and pain** → pelvic hematocoele, pelvic abscess (see p. 143) → retention.

v. **No menstrual abnormality** → impacted ovarian tumor, cervical fibroid or ovarian mass.

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**FEMALE METAL CATHETER (FIG. 38.6)**

**Description and Identification**
It is a metallic catheter with a flat handle at its on end. The other end has several openings on its either side. This perforated end is introduced through the urethra into the bladder to drain urine.

**Uses**
- To empty the bladder prior to major vaginal operations. Not only it facilitates the operation but minimizes the injury to the bladder.
- To confirm the diagnosis of Gartner’s cyst from cystocele (see p. 172).
- It is not used in obstetrics to avoid trauma.

**Sterilization**
By autoclaving or boiling.

**Uses in PFR (see p. 181)**
- To empty the bladder prior to the operation.
- To note the lower limit of the bladder before making the incision on the vagina.

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**FOLEY’S CATHETER (FIG. 38.7)**

**Description and Identification**
It is made of silicon rubber. The catheter tip has two slit openings one on either side for drainage of urine. The other end goes to the urinary bag for collection of urine. The catheter has two channels within. One channel for drainage of urine and the other channel is used to push some water through it. Water inflates the catheter bulb that makes the catheter self-retaining. The bulb capacity is written on the catheter. The catheters are of different sizes. The commonly used sizes in female are 14F, 16F or 18F.
Uses

It is used in gynecology for:

- **Continuous drainage of bladder.** Common indications of use are:
  - Vaginal/abdominal hysterectomy.
  - Pelvic floor repair.
  - Repair of VVF.
  - Urinary retention due to pelvic tumor/retroverted gravid uterus.
  - Radical hysterectomy.
  - To monitor urine output in a critically ill-patient.
- During hysterosalpingography and sonohysterosalpingography (SIS). The catheter is introduced into the uterocervical canal. The balloon is inflated to occlude the internal os. The media (dye/saline) is pushed (see p. 195) and sonography is then done.
- To assess the patency of the fallopian tube during laparotomy. The catheter is introduced in the uterocervical canal. The balloon is inflated to occlude the internal os. The dye is then pushed through the catheter. Spillage of dye from the fimbrial end is then verified.

Sterilization

It is available in a sterile package following sterilization with Ethylene Tetra Oxide (ETO). It is disposable.

Self-assessment

**Q. Why the term Foley’s is attached?**

**Ans.** See Dutta’s Bedside clinic p. 480.

- What are the urinary complications following abdominal hysterectomy?
- Common urinary complications of vaginal hysterectomy.
- Mention the postoperative management following repair of VVF.
- Common causes of retention of urine due to pelvic tumor or retroverted gravid uterus (see p. 338).
- What is sonohysterosalpingography (SIS)?

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**CERVICAL DILATORS (FIGS 38.8A AND B)**

**Description and Identification**

It is a single ended (Hawkin-Ambler) or double ended (Hegar’s) metallic cervical dilator. The disk shaped end is the handle and the other pointed side, is the dilating end. It has a smooth curvature with the tip directing upwards to follow the curvature (anteversion and anteflexion) of the uterus.

**Varieties**

- Hawkin-Ambler: There are 16 sets starting from 3/6 and ends with 18/21 (Fig. 38.8A).
- Hegar’s: There are 12 sets, the smallest one is of 1–2 mm. This is used mainly in gynecological operations.
- Das’s dilator (named after Sir Kedarnath Das) (Fig. 38.8B). Both the sides of the instrument are used. The side with smaller diameter is used first.

**Uses**

- To dilate the cervix to facilitate intrauterine introduction of instruments (curette), devices (IUCD), hysteroscope or radium.
- To dilate the cervix to facilitate drainage of intrauterine collection—pyometra, hematometra or lochiometra (see p. 138).
- To confirm patency of cervical canal after amputation of the cervix.
- To dilate the urethra in urethral stricture.

**Sterilization:** Boiling or autoclaving.

**Self-assessment**

- Indications of dilatation of the cervix only (see p. 484).
- Indications of amputation of cervix (see p. 489).
- Causes of pyometra (see p. 138).
- Complications of dilatation operation (see p. 485).

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**MULTIPLE TOOTHED VULSELLUM (FIG. 38.9)**

**Description and Identification**

It is a long metallic instrument. It is designed to have small teeth (3–4) arising from each blade. The teeth fit in spaces between them. It is used to grasp tissues firmly with less trauma. The handle has a catch that also makes the grip firm.

**Uses**

- To hold the parous cervical lip in operations like D&C, anterior colporrhaphy or vaginal hysterectomy. Its function is to make the cervix steady by traction.
- To remove a polyp by twisting as an alternative to Lane’s tissue forceps.
To hold the fundus of the uterus and to give traction while the clamps are placed in operation of total abdominal hysterectomy for benign lesion.

**Sterilization**
Autoclaving and boiling.

**When the posterior cervical lip is to be held?**
Usually the anterior lip is held but in some conditions, the posterior lip is to be held. Such conditions are:

- In amputation cervix or vaginal hysterectomy when the posterior cervicovaginal mucous membrane is cut (see p. 181, 485).
- Posterior colpotomy for drainage of pus (pelvic abscess).
- During vaginal ligation of tubes.
- When there is growth in the anterior lip (cancer cervix).
- Culdocentesis (see p. 95).

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### SINGLE TOOTHED VULSELLUM (FIG. 38.10)

**Description and Identification**
It is a long metallic instrument. It is similar to multiple toothed vulsellum. This instrument is designed to have two long teeth, one arising from each blade. Compared to a multiple tooth vulsellum, depth of tissue penetration is more in single toothed vulsellum.

**Uses**
- To hold the cervix after opening the vault of vagina and to give traction while the remaining vault is being cut in total abdominal hysterectomy (see p. 490).
- To hold the new cervical stump after amputation of the cervix and in Fothergill's operation (see p. 177, 489).
- To hold the cervical stump left after (abdominal) subtotal hysterectomy (see p. 490).
- Sometimes to hold the anterior lip of nulliparous cervix in operation of D&C (Allis' tissue forceps preferred).

**Sterilization**
Autoclaving and boiling.

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### ANTERIOR VAGINAL WALL RETRACTOR (FIG. 38.11)

**Description and Identification**
It is a long metallic instrument. Its both the ends are flattened, fenestrated, and transversely serrated. The flattened ends are of different sizes. The long shaft of the instrument is used as the handle.

**Uses**
- To retract the sagging anterior vaginal wall to have a good look on the cervix while retracting the posterior vaginal wall by the Sims' speculum.

**Sterilization**
Autoclaving and boiling.
OLIVE POINTED MALLEABLE GRADUATED METALLIC UTERINE SOUND (FIG. 38.12)

Description and Identification
It is a long metallic instrument. It has one flattened end that works as the handle. The other end is olive pointed (as described above). The instrument is graduated both in inches and centimeter and it is malleable. Its curvature could be changed (anteverted or retroverted) to adapt the position of the uterus and for ease of introduction.

Uses
- To confirm the position of the uterus.
- To note the length of the uterocervical canal.
- It acts as a first dilator.
- To sound the uterine cavity in a case of IUCD with missing threads.
- To differentiate a polyp from inversion.
  Originally it was used to detect stone in urinary bladder by way of touching (sounding).

Sterilization
Autoclaving and boiling.

Self-assessment
- Describe the normal position of the uterus and length of the uterocervical canal (7.5 cm).

UTILITY CURETTE (FIGS 38.13A TO C)

Description and Identification
It is a long metallic instrument with a small fenestrated end at each side and a shaft in between. The shaft is used as the handle. The edge of the fenestration is sharp at one end and on the other end it is blunt. The blunt and the sharp edges are directed in opposite direction.

Types
- Sharp at one end, blunt at the other (Fig. 38.13A)
- Sharp or blunt at both ends
- Handle with only sharp at one end
- Flushing curette (blunt) (Fig. 38.13B)
- Sharman's curette (Fig. 38.13C).

Uses

Sharp Curette (Fig. 38.13A)
- Infertility (see p. 197)
- Dysfunctional uterine bleeding (DUB) (see p. 156)
- TB endometritis
- Endometrial hyperplasia.

Blunt Curette
- Suspected choriocarcinoma (see p. 485).
- Suspected endometrial carcinoma (see p. 485).

Flushing Curette (Fig. 38.13B)
- Following D&E (see Dutta's Bedside Clinic p. 258).

Sharman's Curette (Fig. 38.13C)
Infertility work up, where only a strip of endometrium is enough to study the hormonal reflection. It is done as an outpatient procedure and without anesthesia.

Sterilization
By autoclaving or boiling.
Self-assessment

Q. What is the purpose of doing endometrial biopsy in a woman with infertility?
Ans. To detect evidence of ovulation—by seeing the secretory changes in the endometrium (see p. 71, 72).

Q. Which day of the menstrual cycle endometrial biopsy is usually done?
Ans. Biopsy should be done on D21–D23 when the cycle is regular. When the cycles are irregular, it is done within 24 hours of the menses.

Q. What are the methods to assess the endometrium?
Ans. A. Endometrial thickness is assessed by: (a) Transvaginal sonography (TVS), (b) Saline infusion sonography (SIS), and (c) Hysteroscopy. B. Histologic evaluation of endometrium is done by: (a) Pipette (b) Uterine curettage and (c) Hysteroscopic targeted biopsy.

Q. In the endometrial biopsy, what is the earliest evidence of ovulation?
Ans. Subnuclear vacuolation is the earliest evidence appearing within 36–48 hours of ovulation (see p. 72).

Q. What are the other methods of diagnosis of ovulation?
Ans. BBT, cervical mucus study, vaginal cytology, serum progesterone, serum LH and estradiol, sonography and laparoscopy (see p. 192, 193).

Q. What are the ovarian causes of infertility?
See p. 192.
Ans. Anovulation, LPD and LUF (see p. 192).

Q. What are the risks of overzealous curettage of the endometrium?
Ans. (a) Excess curettage destroys the basal layer of the endometrium. This will cause uterine synechiae formation (Asherman’s syndrome), (b) Women may suffer amenorrhea or hypomenorrhea, (c) Risk of developing morbid adherent placenta, in subsequent pregnancy is more.

UTERINE DRESSING FORCEPS (FIG. 38.14)

Description and Identification
This instrument has a smooth curvature which is directed upwards close to its anterior half.

The instrument is often confused with laminaria tent introducing forceps. Here the blades are transversely serrated while in the latter, there is a groove on either blade.

Uses
- To swab the uterine cavity following D&E operation with a small gauze piece.
- To dilate the cervix in lochiometra or pyometra.
- To plug the uterine cavity with gauze twigs in continued bleeding after removal of polyp.

Sterilization
Autoclaving or boiling.

Self-assessment
- Causes of pyometra (see p. 138).
- Management of polyps (see p. 233).

SPONGE HOLDING FORCEPS (FIG. 38.15)

Description and Identification
It is a long metallic instrument. The uterine ends are oval shaped, fenestrated with transverse serrations on their inner surfaces. The other end is the handle with two finger rings and the catch. The presence of transverse serrations at the uterine end and the catch at the handles ensures firm grip of the instrument.

Uses
- Antiseptic dressing before any abdominal or vaginal operation.
- To clean the vagina with gauze pieces before and after vaginal operations.
- To hold the cervix in circlage operation during pregnancy.
- To remove cervical polyp by holding and twisting.

Sterilization
Autoclaving or boiling.

Rubber guarded sponge forceps may be used to occlude ovarian vessels at the infundibulopelvic ligament temporarily, during myomectomy.
Self-assessment

Q. Name a few common abdominal operations.
Ans. Abdominal hysterectomy (see p. 490), myomectomy (see p. 498), ovariectomy (see p. 495).

Q. Name a few common vaginal operations.
Ans. • D&C (see p. 484)
   • PFR (see p. 177)
   • Vaginal hysterectomy (see p. 178)
   • Fothergill’s operation (see p. 177).

OVUM FORCEPS (FIG. 38.16)

Description and Identification
It is a long metallic (steel) instrument with two ends and a shaft. The handle has no catch. For this reason, risk of crushing any tissue, if it is grasped inadvertently, is less. The fenestrated end has no serrations inside. This way (absence of catch and serrations) ovum forceps differs from a sponge holding forceps. It is often confused with sponge holding forceps but it has no catch. As such, it minimizes trauma to the uterine wall if accidentally caught and also it has got no crushing effect on the conceptus.

Uses
♦ To remove the products of conception in D&E after its separation partially or completely.
♦ To remove molar tissue in hydatidiform mole.
♦ To remove uterine polyp (small).

Sterilization
Autoclaving or boiling.

Methods of Use
The cervical canal is dilated first. The instrument is introduced with the blades closed and opened inside the cavity. The products are caught and then with twisting movements and simultaneous traction, the products are removed.

Complications
It may produce injury to the uterine wall to the extent of even perforation. Not infrequently, a segment of intestine or omentum may even be pulled out through the rent.

ALLIS TISSUE FORCEPS (FIG. 38.17)

Description and Identification
It is a metallic instrument having two ends. One end is the handle with the provision of catch. The other end has the arrangement of multiple teeth (4–6). The blades allow some space within in locked position so that the tissue hold is not crushed. This forceps may be of different sizes.

Uses
♦ To hold the margins of the vaginal flaps in colporrhaphy operation (see p. 178).
♦ To hold the peritoneum or rectus sheath during repair of the abdominal wall.
♦ To hold the margins of the vagina in abdominal hysterectomy (see p. 491, 492).
♦ To hold the anterior lip of the cervix in D&C operation (see p. 485).
♦ To catch the torn ends of the sphincter ani externus in CPT repair (see p. 356).
♦ To remove a small polyp.
♦ To take out the tissue in wedge biopsy (see p. 487).

Self-assessment

Q. What are the common symptoms associated with genital prolapse?
Ans. Woman may remain asymptomatic if the prolapse is mild. The common symptoms are genital organs protruding out of the vaginal opening, difficulties in walking, sitting, urination or defecation. Prolapse may interfere with sexual intercourse or may cause vaginal bleeding due to ulceration of mucosa. It may cause incontinence of urine, pelvic pressure or backache.
**LANES TISSUE FORCEPS (FIG. 38.18)**

**Uses**
- To hold parietal wall (bulk of tough tissues) for retraction during abdominal operations with transverse incision (hysterectomy).
- To hold the polyp or fibroid in polypectomy or myomectomy operation.
- To hold the towels during draping.

**Sterilization**
Autoclaving or boiling.

**UTERUS HOLDING FORCEPS (FIG. 38.19)**

The blades are protected with rubber tubes to minimize trauma to the uterus.

**Uses**
- To fix and steady the uterus when conservative surgery is done on the adnexa (tuboplasty see p. 202).
- What are the different surgical procedures for proximal and distal tubal disease?

**CERVICAL OCCLUSION CLAMP (FIG. 38.20)**

The blades are guarded with rubber tubes to avoid trauma to tissues.

**Uses**
Evaluation of tubal patency during laparotomy (following tuboplasty).

**Procedure**
Cervix is occluded with the instrument and methylene blue dye is injected into the uterine cavity through the fundus using a syringe and a needle.

**Self-assessment**
- Different methods to assess tubal patency (see p. 236).
- Different types of tubal reconstructive surgery.

**MYOMA SCREW (FIG. 38.21)**

**Description and Identification**
It has one spirally designed side that ends at a sharp point. Others end is the handle. The sharp spirally designed end goes inside the myoma during operation.

**Uses**
- To fix the myoma after the capsule is cut open and to give traction while the myoma is enucleated out of its bed (myomectomy) (Fig. 38.50).
- To give traction in a big uterus (multiple fibroid) requiring hysterectomy while the clamps are placed.
- To liftout a big uterus for ease of operation through the abdominal incision.
**Self-assessment**
- Indications of myomectomy (see p. 229)
- Steps of myomectomy (see p. 498)
- Complications of myomectomy (see p. 499)

**Important considerations before myomectomy** (see p. 229).

**Sterilization**
Autoclaving or boiling.

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**BONNEY’S MYOMECTOMY CLAMP (FIG. 38.22)**

**Uses**
- The clamp is used in myomectomy operation. It curtails the blood supply to the uterus temporarily, thereby minimizing the blood loss during operation. Simultaneous, bilateral clamping of the infundibulopelvic ligaments by rubber guarded sponge holding forceps may be employed.
- The instrument is placed at the level of internal os with the concavity fitting with the convexity of the symphysis pubis. The round ligaments of both sides are included inside the clamp to prevent slipping of the instrument and preventing the uterus from falling back. The clamp is removed after suturing the myoma bed but before closing the peritoneal layers.

**Fig. 38.22: Bonney’s myomectomy clamp**

- It is seldom used nowadays. Alternative methods are: Preoperative use of GnRH analog (see p. 434), and/or intraoperative use of tourniquets, vasoconstrictive agents (vasopressin) and others.

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**HYSTEROSALPINGOGRAPHY CANNULA (LEECH WILKINSON VARIETY) (FIG. 38.23)**

**Description and Identification**
It is a long metallic instrument having two ends and a channel inside.
- The uterine end is shaped like a cone and is spirally designed.
- The other end has a valve device through which a radiopaque dye could be pushed in.
- During HSG, a syringe is required to push the dye. Iodine containing radio-opaque dye (urograffin) is used. It is done in the radiology department without anesthesia.

**Uses**
- Hysterosalpingography (HSG) (see p. 486)
- For hydrotubation
- Laparoscopic chromopertubation.

**Hydrotubation:** Medicated solution is pushed transcervically in conditions such as following tuboplasty operation or suspected flimsy fimbrial adhesions. The drugs instilled are dexamethasone 4 mg with gentamicin 80 mg in 10 mL normal saline. It should be instilled in the proliferative phase for at least 3 cycles.

**Sterilization**
Autoclaving or boiling.

**Self-assessment**
- What is HSG? (see p. 486)
- Timing of HSG (see p. 487).

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**Advantages of HSG over laparoscopic chromopertubation (see p. 235).**

**Q. How do you compare the oil-based versus water-based media used in HSG?**

**Ans.** Water-based media is commonly used. It causes less cramping pain and discomfort. Oil-based media gives better image and has higher pregnancy rates. Granuloma is more with oil-based media. Embolization is minimal with either media (see p. 486).

**Q. What are the indications of HSG?**

**Ans.** See p. 486.

**Q. Advantages of laparoscopy over HSG.**

**Ans.** See p. 235.

**Q. What are the complications of HSG?**

**Ans.** See p. 487.

**Q. What are the other alternatives to HSG?**

**Ans.** Diagnostic laparoscopy and dye test; sono-hysterosalpingography test (see p. 235).

**Q. What is saline infusion sonography?**

**Ans.** See p. 98.
KOCHER’S ARTERY FORCEPS (FIG. 38.24)

Description and Identification
This is a hemostatic forceps and may be of straight or curved variety. This instrument has a tooth at the end of one blade and a groove on the other, so as to have a firm grip on the tissue pedicle. The handles have the provision of catch.

Uses
- To use as a clamp in hysterectomy operation
- To hold vascular pedicles before cutting.

Sterilization
Autoclaving or boiling.

Self-assessment
- What added advantage it has got?
  Due to the presence of tooth, it gives a firm grip to the pedicle hold.
- Indications of abdominal hysterectomy (see p. 490).
- Mention the different sites where the clamps are placed in total abdominal hysterectomy (see p. 491).
- Principal steps of Fothergill’s operation (see p. 177).
- Complications of Fothergill’s operation (see p. 179, Table 16.6).

LANDON’S BLADDER RETRACTOR (FIG. 38.25)

Description and Identification
It is a metallic instrument. One end is flattened with a rectangular shape. The other end is the handle. The handle is fenestrated and has a circular gap in the middle for good grip with the fingers.

Uses
- In vaginal hysterectomy.
- To keep the bladder up, to facilitate opening of the uterovesical peritoneum (see p. 180).
- To introduce it through the opening of the uterovesical pouch and to retract the bladder while the clamps are placed. This prevents injury to the bladder (see p. 181).
- To inspect the suture lines after completion of vaginal plastic operations by retracting the anterior or posterior vaginal wall.
- Intravaginal plugging can be done under its guidance.
- To use as lateral vaginal wall retractor while the clamps are placed.

Sterilization
Autoclaving or boiling.

Self-assessment
Q. What are the nonsurgical treatments of prolapse?
Ans. Conservative treatments include: (i) To avoid aggravating factors (obesity, chronic cough, constipation). (ii) Pelvic floor exercise. (iii) Estrogen replacement therapy (postmenopausal women). (iv) Pessary in some cases.

Q. Mention the different sites where the clamps are placed during vaginal hysterectomy (see p. 181).

Q. Mention the important postoperative complications following vaginal hysterectomy with PFR (see p. 183).

INSUFFLATION CANNULA (FIG. 38.26)

Description and Identification
The instrument is not complete. It requires a ‘Y’ rubber tube. One end is attached to a bulb and the other end to a manometer.

Use
- To know the patency of the tube (Rubin’s test) in infertility investigation or following tuboplasty.
SELF-ASSESSMENT

- Ideal time of operation in relation to menstrual cycle (see p. 236).
- Complications of D&I (see p. 486).
- Advantages of HSG over D&I (see p. 487).

ABDOMINAL RETRACTORS (FIGS 38.27A TO C)

Description and Identification
Retractors are used to retract tissues out of the operative field. This is needed for better exposure of the operative field during surgery. Retractors are held in place and retracted either by an assistant (manual retractor) or by counter pressure with some device (self-retaining retractor). Manual retractor can be used alone or in combination with a self-retaining retractor. Manual retractors can be placed according to need.

DOYEN’S RETRACTOR (FIG. 38.27A)

Description and Identification
This is a long and heavy metallic instrument. One end is the handle and the other end is flattened and curved with concavity inwards.

Uses
- To retract the abdominal wall in abdominal pelvic surgery to expose the field of operation.
- As an alternative, self-retaining retractor may be used.

BALFOUR SELF-RETAINING RETRACTOR (FIG. 38.27B)

Two lateral blades and an additional (third) blade. All the blades are detachable and may be of different sizes.

Uses
- To retract the abdominal wall all around.
- To expose the field of operation widely (no assistant is needed for manual retraction).

DEAVER’S RETRACTOR (FIG. 38.27C)

Description and Identification
It is a metallic instrument. It is designed flattened, and curved.

Sterilization
Autoclaving or sterilization.

Uses
- It is used in abdominal operation to retract the viscera as and when required in order to facilitate the operative procedures like abdominal hysterectomy. For that purpose, it may also be used as a lateral retractor.
- To retract the parietal wall during abdominopelvic surgery (hysterectomy).
- To retract the bladder or intestines during the surgery.
LONG STRAIGHT HEMOSTATIC FORCEPS
(SPENCER WELL’S) (FIG. 38.28)

Description and Identification
It is a long hemostatic forceps. It is designed to have the blades with transverse serrations on the inner surfaces. This ensures firm pedicle grip. The handles have the provision of catch. Both the straight and curved varieties are available.

Uses
- It is used to hold the vascular pedicles as a clamp in (a) hysterectomy (b) salpingectomy or (c) salpingo-oophorectomy operation.
- To catch a bleeding vessel for hemostasis deep into the pelvis.

Self-assessment
- Mention the important pedicles hold in total abdominal hysterectomy (see p. 490, 491).
- Indications of salpingectomy (see p. 496).
- Pedicles hold in vaginal hysterectomy.
- Pedicles hold during salpingo-oophorectomy (see p. 491). (Fig. 35.5A, p. 492).
- Complications of abdominal hysterectomy during the operation (see p. 493).

BABCOCK’S FORCEPS (FIG. 38.29)

Description and Identification
It is a metallic instrument with two ends. Handles have got catches. The other end has fenestrated blades. The blades are curved and allow some space within, in locked position, so that structure hold in between is not crushed.

Uses
- To hold the fallopian tube in tuboplasty operation.
- To hold lymph nodes during dissection in radical hysterectomy (lymphadenectomy p. 499).
- To hold the appendix, bowel during appendicectomy.
- To hold the ureter during dissection (Wertheim’s operation).

Sterilization
Autoclaving or boiling.

NEEDLE HOLDER (FIG. 38.30)

Description and Identification
The instrument blades are short, the handles are long. Needle holders with long handles are useful for suturing at a depth. The inner surface of the blades have crisscross serrations and a longitudinal groove in the middle. This ensures firm grip and prevents the needle from rotating.

Needle holders may be long and heavy or small and delicate. It may be straight (Wangensteen) or curved (Heaney) variety.

Uses
- The curved variety may be helpful to see tissues at a depth (vaginal surgery).
- To catch-hold the needle, the needle should be caught at the junction of its anterior 2/3rd and posterior 1/3rd.

Sterilization
Autoclaving or boiling.
**BARKELEY BONNEY VAGINAL CLAMP (FIG. 38.31)**

**Uses**
- To occlude the vaginal canal prior to cutting the vagina in Wertheim's hysterectomy.

![Fig. 38.31: Barkelay Bonney vaginal clamp](image)

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**PUNCH BIOPSY FORCEPS (FIG. 38.32)**

**Description and Identification**
It is a long metallic instrument with two ends. At one end the oval blades with sharp cutting edges are there. The incised bit of tissue remains within these two blades. The other end is the long handles. There is no catch in the handle.

**Uses**
- To take biopsy from the cervix.
- The biopsy is taken as an outdoor procedure without anesthesia. The site of biopsy is either from the suspected area or Schiller's iodine or colposcopically directed.

**Sterilization**
- Autoclaving or boiling.

**Self-assessment**
- Mention the different types of cervical biopsy (see p. 487). Biopsy can also be made under Colposcopy directed or following schiller’s test (see p. 284).

---

**DISSECTING FORCEPS (FIGS 38.33A AND B)**

**Toothed Variety**

**Uses**
- To hold tough structures like rectus sheath, cut margins of vaginal vault following hysterectomy or margins of vaginal flaps in PFR or the skin margins during suturing.
- To hold the needle during tissue suturing to make it steady and to be pulled out by the needle holder.
- To hold the suture ends during stitch removal.

**Plain or non-toothed Variety**

**Uses**
- To hold soft tissues like muscles, peritoneal margins during suturing.
- To hold bleeding vessels for cauterization.
SCALPEL (FIGS 38.34A TO C)

Description and Identification
The instrument has a—handle (Bard Parker’s) and a detachable blade.

Blades with sizes (10, 11, 12, 15, 20, 22) are specific to a particular number of handle. The size 10 is most commonly used size. The size 11 (bayonet-shaped) is used for stab incisions.

Uses
- To cut the abdominal wall—skin, subcutaneous tissue, rectus sheath, and opening the peritoneum.
- To cut the mucous coat in vaginal plastic operation and to cut tissues during surgery.
- To cut pedicles during hysterectomy.
- To make incision for drainage of abscess (Bartholin’s abscess).

Sterilization
Blades are disposable (sharp). The handles are autoclavable.

NEEDLES (FIG. 38.35)
Curved needles need less space for suturing. These are suitable for most surgical procedures. Curved needles are available in various curvatures like 1/2 circle, 3/8 circle, etc. Less the arc the needle has, more shallow a bite the needle takes.

Round Bodied (Curved)
It is used while suturing soft structures like:
- Peritoneum, muscles.
- Suturing the pedicles in hysterectomy.
- Suturing the pubocervical fascia.
- Tubectomy or salpingectomy operation.

Cutting (Curved)
It is used while suturing tough structures like:
- Suturing the vaginal wall margins in PFR (see p. 179).
- Closure of the vaginal vault following hysterectomy (see p. 493).
- Repair of the rectus sheath.
- Suturing the skin.

SCISSORS (FIGS 38.36 TO 38.39)
Scissors are used to dissect and cut tissues. It may be straight or curved variety.

Mayo’s type (Fig. 38.36)
This is used in almost every operation requiring tissue dissection and excision. It is mainly used for cutting tough tissues like, e.g. rectus sheath, vaginal vault, peritoneum, cutting sutures, ligaments.
Bent on flat (Bonney) type (Fig. 38.37)
This is used conveniently in anterior colporrhaphy to dissect the vesicovaginal space and also for tissue dissection.

Metzenbaum (Fig. 38.38)
This is used to dissect and cut tissue such as peritoneum and adhesions.

Perineorrhaphy (Fig. 38.39)
It is comfortably used in perineorrhaphy operation; also used in episiotomy.

Sterilization
♦ Immersing in Cidex (gluteraldehyde) solution for 24 hours.

Self-assessment
♦ Indications of PFR (see p. 179).
♦ Complications of PFR (see p. 182, 183).
♦ Principal steps of perineorrhaphy, PFR, CPT repair (see p. 176).
♦ Complications in abdominal wound.

Q. What is wound dehiscence?
Ans. When the separation of the layers of abdominal wound is up to the peritoneum—it is called a complete dehiscence. If the intestines come out of the wound, it is called evisceration or burst abdomen.

Burst abdomen usually occurs between seven and ten days of the operation. Predisposing factors are malnutrition, infection, cough due to chronic lung disease or abdominal distension.

Management: In the operation theater, under general anesthesia, necrotic tissues and clots are removed. The bowel is cleansed thoroughly with warm normal saline and placed back in the abdominal cavity.

Through and through nylon (No. 2) sutures are passed 2 cm apart and about 3 cm from the skin margins to close the wound. Sutures are left in place for three weeks. Antibiotic (broad spectrum) is started and modified according to the culture and sensitivity report. Predisposing factors are to be taken care of.

Towel Clips (Fig. 38.40)

Uses
♦ These are used in draping the operative area—abdominal or vaginal. The towels or sheets are fixed to the skin and to each other with these clips.
♦ To fix the electrodiathermy cables, suction irrigation tubings, endoscopic surgery cables.

Sterilization
Autoclaving.

Self-assessment
♦ How the antiseptic cleaning in abdominal or vaginal operation is done in the operation table prior to draping? (see p. 482).
**LOOP HOOK (FIG. 38.41)**

**Uses**
To remove IUCD from the uterine cavity when the threads are missing (see p. 396).

**Method of Use**
The cervical canal is dilated if needed (see p. 484). The hook is introduced within the uterine cavity. The IUCD is felt and is grasped within the hook. It is then pulled out.

**Precautions**
Location of the IUCD within the uterine cavity must be confirmed by sonography (see p. 396). Trauma (perforation) to the uterus is to be avoided. Hysteroscopic removal can also be done.

---

**ELECTROCAUTERY (FIG. 38.42)**

**Uses**
Thermal cauterization of the cervix for cervical ectopy (see p. 488).

**Self-assessment**
- Steps of thermal cauterization (see p. 488).
- How tissue healing occurs? (see p. 488).
- How the patient is counseled for the postoperative care? (see p. 488).
- What are the complications of the procedure?
  **Ans.** Excessive vaginal discharge, slight vaginal bleeding, and pelvic pain.

---

**CRYOPROBE (FIG. 38.43)**

**Uses**
Tissue destruction is done by freezing (see p. 488) at '−90°C'.

**Self-assessment**
- *What are the indications of cryotherapy?*
  **Ans.** (a) Cervical lesions: ectopy (erosion), CIN, VIN (see p. 260), VaIN (see p. 261).
- *What is the principle of using cryotherapy?*
  **Ans.** The cryoprobe is held in contact with the tissue and the tip is cooled to '−90 °C' (CO₂ is commonly used). Freezing produces cellular dehydration by crystallization of intracellular water and ultimately death of cells occur. Tissue damage occurs upto 5 mm depth.
- *What are its advantages over thermal cauterity?*
  **Ans.** (a) No anesthesia is needed. (b) Precise tissue destruction. (c) No secondary hemorrhage.
- *What are the disadvantages?*
  **Ans.** Excessive vaginal discharge for about 10–14 days.
LAPAROSCOPIC INSTRUMENTS (FIG. 38.44)

A. Telescope (see p. 504): Commonly used are 5 mm or 10 mm diameter and viewing angle may be 0 or 30 degrees.

B. Trocar and cannula (see p. 504).

C. Veress needle (see p. 504).

The Veress needle consists of a spring loaded blunt perforated trocar within a sharp cannula. Resistance allows the sharp cannula to protrude but when the resistance disappears, the blunt trocar protrudes out. This prevents injury to the viscera.

Uses

It is used in laparoscopy operation to produce pneumoperitoneum. The common site of puncture is through a small incision made in the lower rim of the umbilicus (see p. 506).

TROCAR AND CANNULA (FIG. 38.45)

The instrument is introduced through the same infraumbilical incision (through which Veress needle is passed), at an angulation of 45° towards the pelvis. After its introduction, trocar is withdrawn and the telescope is introduced. It is then attached to the cold light source (see p. 508).

Self-assessment

- Indications of laparoscopy (see p. 101 and 507).
- Complications (see p. 509).
- Distension media used (see p. 511).

HYSTEROSCOPIC INSTRUMENTS (FIGS 38.46A TO C)

A. Telescope (see p. 511): 4 mm 0 degree

B. Telescope with working element (see p. 511)

C. Electrode (coagulating roller ball electrode).

Self-assessment

- Indications of hysteroscopy (see p. 512)
- Distension media used (see p. 511)
- Complications (see p. 513)
- Contraindication of hysteroscopy.

HODGE-SMITH PESSARY (FIG. 38.47)

It is made up of rubber silicone or ebonite. It is sterilized by immersing it in Cidex for 12 hours.

Indications of Use

See p. 165.
Method of Insertion
The patient lies in dorsal position with an empty bladder. The pessary is held collapsed or folded to make the insertion easy. A lubricant may be used. It is introduced inside the vagina and is pushed high. The broad end lies in the posterior fornix, the narrow end behind the symphysis pubis and the concavity is directed upwards.

Instructions to the Patient
- To have vaginal douche at least twice a week
- To check after 1 month
- To be removed or reintroduced after 3 months.

RING PESSARY (FIG. 38.48)
It is made up of silicon and rubber. It is sterilized by keeping in Cidex for 12 hours.

Indication of Uses
See Chapter 16

Contraindications of Use
- Presence of sepsis.
- Gross relaxation of pelvic floor muscles.

Measurements
As in Hodge-Smith pessary.

Instructions
As in Hodge-Smith pessary.

Self-assessment
- Mechanism of action (see p. 165).
- How the patient is followed up and what symptoms are usually enquired?

Ans. Pessary removal, examination, cleaning and reinsertion is done usually at an interval of 2–3 months. It is done initially by the doctor/nurse and later on by the patient herself once she is taught about the procedure. In every follow up visit, patient is asked about any symptoms like: vaginal bleeding, pain, offensive discharge and voiding difficulty.

What are the complications of pessary use?

Ans. Vaginal discharge, bad odor, vaginal erosion, ulceration, pessary incarceration, forgotten pessary rarely vaginal cancer (rare).

PROCESSING OF INSTRUMENTS

- Disinfection: It is done by any one of the methods: Immersing instruments in (i) boiling water for 20 minutes (ii) 2% glutaraldehyde (Cidex) solution for 20 minutes or (iii) 0.5% chlorine solution for 20 minutes (0.5% of chlorine solution is made by adding 3 teaspoons (15 g) of bleaching powder in one litre of water).
- Cleaning: Instruments are disassembled and washed on all surfaces in running (preferably warm) water. The cannulas should be flushed repeatedly.

- Sterilization: Either by — (i) Autoclaving at 121 °C (250 °F), under pressure of 15 lbs/in² (106 kPa) for 30 minutes or (ii) Immersing in 2% gluteraldehyde (Cidex) solution for 10 hours.

STERILIZATION OF INSTRUMENTS

Blunt instruments: All blunt instruments are sterilized either by boiling for half an hour or in an autoclave for 20 minutes with 20 lbs pressure at 120°C.

Sharp instruments: Sharp instruments like knife, needle, etc. are sterilized by keeping in Lysol for 24 hours.
SUTURE MATERIALS

The suture materials used in a particular surgical step depend on the strength of the tissues to be sutured and the time required for the wound to regain its strength. Depending on diameter, sutures are categorized into no. 0, 1, 2, etc. Sutures when smaller than no. 0, are indicated as 1–0, 2–0, and so forth. Due considerations also to be given on tensile strength of the suture, the rate at which the suture material loses its strength in vivo and the interaction expected between suture and tissues.

CLASSIFICATION

The suture materials may be classified either as absorbable or nonabsorbable. Their biological origin or synthetic preparations are mentioned briefly.

- Absorbable
- Nonabsorbable

Absorbable
- Biological (Natural)
- Synthetic

Biological

- Catgut and collagen

Sutures: Sutures may be monofilament (Dexon, PDS, nylon) or polyfilament (vicryl, silk). It is based on the number of fiber strands. Monofilament (single stranded fiber) sutures need 5 to 6 throws to make knots secured. Polyfilament sutures are braided and their knots are secured with usual (2 to 3) throws. Risks of infection are high with polyfilament sutures. However the tensile strength of polyfilament sutures is high.

The catgut (derived from the word kitgut—strings of a musical instrument known as kit) is obtained from the submucosa of sheep or ox intestines. Collagen is derived from ox Achilles tendon. Both are available in plain and chromic form. Treatment with chromic sulfate produces chromic catgut and the untreated material produces plain catgut. Chromic catgut is degraded and phagocytosed by proteolytic enzymes of white blood cells (inflammatory cells) slowly. Chromic catgut loses half of its tensile strength by 10 days and maintains some strength up to 21 days. Plain catgut loses 70% of its tensile strength by 7 days.

Synthetic

Dexon

Dexon (polyglycolic acid) is a copolymer of glycolic acid and is degraded by hydrolysis with minimal inflammation. It loses half of its tensile strength in 15 days and is absorbed in 4 months.

Vicryl (coated)

Vicryl (poliglactin): It is a copolymer of lactide and glycolide. It loses its tensile strength in 30 days. It is absorbed by 70 days. It produces less tissue reaction than catgut.

Vicryl rapide (coated): It is also a poliglactin suture. It is similar to plain catgut. Absorption is rapid with minimal tissue inflammation. Seventy percent of its tensile strength is lost by 7 days. It is used for soft tissues, episiotomy repair and skin.

The tensile strength of the above sutures is much greater than that of catgut. But these sutures need more throws to secure knots compared to catgut.

Polydioxanone suture (PDS)

It is a pliable monofilament made of polydioxanone. It loses half of its tensile strength in 28 days. Tissue SUTURES

<table>
<thead>
<tr>
<th>Nature</th>
<th>Type</th>
<th>Wound support</th>
<th>Complete absorption</th>
<th>Tissue where used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorbable</td>
<td>Plain catgut</td>
<td>7–10 days</td>
<td>4–8 weeks</td>
<td>Subcutaneous tissue and its blood vessels</td>
</tr>
<tr>
<td></td>
<td>Chromic catgut</td>
<td>3 weeks</td>
<td>8–12 weeks</td>
<td>Vascular pedicle, vaginal wall, rectus sheath</td>
</tr>
<tr>
<td>Delayed abs</td>
<td>Dexon</td>
<td>3 weeks</td>
<td>8–12 weeks</td>
<td>Subcuticular, Fascial structure, Skin</td>
</tr>
<tr>
<td></td>
<td>Vicryl</td>
<td>3–4 weeks</td>
<td>8–10 weeks</td>
<td>Microsurgery, Vaginal vault</td>
</tr>
<tr>
<td></td>
<td>PDS</td>
<td>6–7 weeks</td>
<td>4-6 months</td>
<td>Rectus sheath, Uterine muscles</td>
</tr>
<tr>
<td></td>
<td>Vicryl Rapide</td>
<td>7–10 days</td>
<td>5–6 weeks</td>
<td>Episiotomy, subcuticular tissues</td>
</tr>
<tr>
<td>Nonabsorbable</td>
<td>Nylon</td>
<td></td>
<td></td>
<td>Skin herniorrhaphy</td>
</tr>
<tr>
<td></td>
<td>Prolene</td>
<td></td>
<td></td>
<td>Herniorrhaphy, Rectus sheath</td>
</tr>
<tr>
<td></td>
<td>Silk</td>
<td></td>
<td></td>
<td>Skin of the abdomen</td>
</tr>
<tr>
<td></td>
<td>Dacron</td>
<td></td>
<td></td>
<td>Ligation of internal iliac artery</td>
</tr>
</tbody>
</table>

All the synthetic absorbable materials are sterilized by ethylene oxide.
inflammation is minimal. Monofilament sutures have no interstices to lodge any bacteria. So infections are rare. **Polyglyconate sutures** have got similar properties. These are used for fascial closure.

**Nonabsorbable**

- **Biological**
  - **Silk** suture can be handled and tied easily. It has excellent knot security. It is sterilized by gamma radiation. It is a foreign protein and initiates strong inflammatory response and loses half of its tensile strength by 1 year. It should not be used in contaminated or infected tissue.
  - **Cotton** is the weakest nonabsorbable suture. It loses 50% of the tensile strength by 6 months. Wet cotton is stronger (10%) than dry cotton. It is rarely used now.

- **Synthetic**
  - **Terelene or Dacron**: These are extruded from a homopolymer.
  - **Polyamide (nylon)**: This is a man-made monofilament or multifilament. It is very much nonreactive in tissues. Monofilament nylon has greater tensile strength, incites less tissue reaction and is less prone to infection than braided nylon.
  - **Polypropylene (prolene)**: It is a hydrocarbon polymer and is monofilament. It has least tissue reaction. Knot security is greater. It is sterilized by ethylene oxide.
  - **Steel** suture is nonreactive and has highest tensile strength. It is not commonly used now in obstetrics and gynecology. This is used in orthopedic and dental surgery. **Nonabsorbable sutures** maintain their tensile strength for a long time. However, there may be suture related pain or rarely sinus formation.

**SPECIMENS**

The description of a specimen includes:

- Identification of the organ/organs.
- To describe the pathology as seen on naked eye examination.

**Identification of the Organ**

**Uterus**

*The uterus is identified by:*

- Pear-shaped structure
- Adnexal attachment
- Cervical opening
  - Circular in nulliparous
  - Transverse slit in parous.

**Anterior surface is identified by**

- Attachment of round ligament

**SPECIMEN — 1 AND 2**

**Description (Figs 38.50, 38.51A and B)**

This is a specimen of uterus with tubes and ovaries of both the sides (Fig. 38.50).

There is alteration in the size (enlarged) and shape (irregular) of the uterus due to multiple fibroids. The fibroids are of different sizes. Some are cut open to show whorled appearance (Fig. 38.51B). A capsule is seen (Fig. 38.50) surrounding the fibroid. Part of the tumor is covered by endometrium (submucous fibroid Fig. 38.51A) or a part is covered by serous coat (subserous fibroid Fig. 38.51B). One subserous fibroid has got a pedicle (Fig. 38.51B)—pedunculated.

The tubes and the ovaries are looking normal in all the specimens.

**Operation done**: Total hysterectomy with bilateral salpingo-oophorectomy.

**Diagnosis**: Multiple fibroids of the body of the uterus.
Multiple fibroid uterus, hysterectomy and bilateral salpingo-oophorectomy had been done. Tissue dissection had been done to show the capsule of the fibroid.

Submucous fibroid polyps—sessile and pedunculated.

Self-assessment

- What are the different types of uterine fibroid (see p. 222).
- Causes of menorrhagia (see p. 152).
- Causes of infertility (see p. 186).
- Causes of pelvic pain (see p. 251).
- How to differentiate a fibroid from an ovarian tumor on clinical examination.

Q. What could be the presentation of the woman in the clinic?  
Ans. As with these specimens with total hysterectomy, the women are unlikely to suffer from infertility and as bilateral oophorectomy had been done, their probable age would be >45 years.

Q. What are the indications, conditions to be fulfilled before myomectomy? What are the contraindications?  
Ans. See p. 229.

Q. What are the different treatment options available for fibroids? (p. 231).  
Ans. A. Surgery—(a) Hysterectomy, (b) Myomectomy.  
Surgical procedures may be: (i) Laparotomy, (ii) Laparoscopy, (iii) Hysteroscopy (see p. 227).  
(c) Myolysis.  
B. Medical therapy.  
C. Interventional radiology—uterine artery embolization.

Q. How do you differentiate fibroid uterus from adenomyosis?  
Ans. See p. 251.

SPECIMEN—3

Description (Fig. 38.52)  
This is a specimen of uterus, with tubes and ovaries of both the sides.

Anterior surface of the uterus is cut open to show a mass arising from the fundus protruding into the uterine cavity. Another mass is seen to come out of the uterus through the cervical canal with a long pedicle.

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy.

Diagnosis: Submucous fibroid polyps—sessile and pedunculated.
Self-assessment

- Clinical presentation of such a case (see p. 252)
- Confirmation of diagnosis.

Q. When do myomas require to be removed (indications of myomectomy)?

Ans. (i) Any myoma growing during the follow-up period.
(ii) Menorrhagia not responding to medical therapy. (iii) Excessive pain or pressure symptoms. (iv) Woman with infertility or recurrent miscarriage when no cause other than fibroid is present.

- What are secondary changes in a fibroid (see p. 224).
- What are management alternative to hysterectomy (see p. 230).

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**SPECIMEN—4**

**Description (Figs 38.53A and B)**

This is a specimen of uterus (Fig. 38.51A) with tubes and ovaries of both the sides. There is a huge mass arising from the posterior cervical wall. The small uterus sits on the top of the huge mass (*lantern on dome of St. Paul’s*).

The anterior surface of the uterus (Fig. 38.51B) is cut open to show the anterior cervical wall and the uterine cavity.

**Operation done:** Total hysterectomy with bilateral salpingo-oophorectomy with removal of the mass.

**Diagnosis:** Cervical fibroid (posterior).

---

**Self-assessment**

- Types of cervical fibroid (see p. 231).
- Modes of presentation in a case with cervical fibroid (see p. 231).
- What are the surgical risks in such a case?
- Displacements of the ureter and risks of ureteric injury (see p. 349).
- Common gynecological pathologies where ureteric injury is more likely (see p. 349).
SPECIMEN—5

**Description (Fig. 38.54)**
This is a specimen of the uterus and the tubes and ovaries of both the sides. The uterus is enlarged and is cut open to show a diffuse growth located at one wall. The growth presents a striated appearance with scattered dark hemorrhagic spots. It has got no capsule. (c.f. — fibroid — whorled appearance and a capsule).

**Operation done:** Total hysterectomy with bilateral salpingo-oophorectomy.

**Diagnosis:** Adenomyosis.

**Self-assessment**
- Describe the clinical presentation of pelvic endometriosis (see p. 257).
- Causes of infertility in endometriosis (see p. 188).
- Clinical features of adenomyosis (see p. 257)
- Histological picture of adenomyosis.
- Mention treatment options for pelvic endometriosis (see p. 258).
- Treatment for adenomyosis (see p. 258).

SPECIMEN—6

**Description (Fig. 38.55)**
This is a specimen of the uterus with tubes and ovaries of both the sides. The ovaries are hugely enlarged, lobulated with a yellowish tinge. The uterus is also enlarged. Vesicular mass is seen protruding out through the incised uterus.

**Operation done:** Total hysterectomy with bilateral salpingo-oophorectomy.

**Diagnosis:** Hydatidiform mole with large theca lutein cysts of both the ovaries.

**Self-assessment**
- High-risk factors for gestational trophoblastic neoplasia (GTN) (see p. 298).
- Clinical features of GTN (see p. 300).
- Management of GTN (see p. 302).
- Place of uterine curettage in GTN.
- Management of theca lutein cysts: Once hydatidiform mole or GTN is treated, there is spontaneous regression (within a few months) of the cysts. Rarely they are removed when complications like torsion or intracystic hemorrhage occur.

Q. **What are the common sites of metastasis?**

Ans. See p. 300.

Q. **What is the place of prophylactic chemotherapy and what are its limitations?**

Ans. See p. 302.

Q. **WHO FIGO scoring system for risk assessment.**

Ans. See p. 302.

Q. **Reproductive behavior of women following treatment of GTN.**

Ans. See p. 302.

Fig. 38.54: Specimen of adenomyosis

Fig. 38.55: Hydatidiform mole with bilateral large theca lutein cysts

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**SPECIMEN—7**

**Description (Fig. 38.56)**
This is the specimen of a uterus with the tubes and ovaries. The uterus is enlarged. The anterior surface of the uterus is cut open to show a purplish growth invading the myometrium. The tube and the ovary are looking healthy.

This 37 years old parous lady was admitted with irregular bleeding P/V following a miscarriage. She underwent D/C thrice. Her serum βhCG level was 96,000 mIU/mL. Following courses of chemotherapy the serum hCG level remained persistently elevated.

**Operation done:** Total hysterectomy with bilateral salpingo-oophorectomy. Histology confirmed chorio-carcinoma.

**Diagnosis:** Choriocarcinoma.

**Self-assessment**

**Q. How the selection of chemotherapy regimen is done?**

**Ans.** See p. 302.
- Place of hysterectomy in GTN (see p. 303).
- Prognosis of GTN following treatment and the risk of recurrence.

**SPECIMEN—8**

**Description (Fig. 38.57)**
This is a specimen of uterus, tubes and ovaries of both the sides. The left tube is markedly enlarged specially towards the outer half. The shape looks like a ‘retort’. The inside fluid appears to be clear.

**Diagnosis:** Hydrosalpinx of the left tube.

**Self-assessment**
- Pathogenesis of hydrosalpinx (see p. 139)
- Organisms involved in pathology
- Mode of affection in gonococcal infection
- Mechanism of the ‘retort’ shape (see p. 139)
- Steps of salpingectomy (see p. 486).

**SPECIMEN—9**

**Description (Fig. 38.58)**
This is a specimen of the uterus, tubes, and ovaries of both the sides. The tubes of both sides are coiled, wall is thickened and matted with the ovaries. There are adhesions over the surfaces of the tubes and uterus. TAH & BSO had been done. Histology confirmed tuberculosis.

**Diagnosis:** Bilateral tubo-ovarian (TO) mass.

**Self-assessment**
- Mention the pathogenesis of TO mass (see p. 110).
- Mention the clinical diagnostic criteria of PID (see p. 108).
- What is the mode of spread of infection in tubercular, pyogenic and other infections? (see p. 106).
- How infertility could be explained with genital tuberculosis? (see p. 115).
- Mention the complications of acute PID and its late sequelae (see p. 109).
- What are the characteristic changes on HSG of the tube when infected with tuberculosis? (see p. 116).
- What are the contrindications and indications of surgery in a woman with pelvic tuberculosis?

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SPECIMEN—10

Description (Fig. 38.59)
This is a specimen of a noncommunicating horn of a bicornuate uterus (cut-opened) with the tube. The tube is elongated, sausage shaped and purplish in color. The cut-open uterus shows the cavity which was filled with blood. The tube is filled with blood.

Operation done: Excision of the noncommunicating horn and salpingectomy.

Diagnosis: Rudimentary (noncommunicating) horn of a bicornuate uterus with hematosalpinx.

Self-assessment

- Causes of hematosalpinx: Tubal ectopic pregnancy, endometriosis, cryptomenorrhea (see p. 371) and rarely primary tubal carcinoma (0.3% of all genital malignancies).

SPECIMEN—11

Description (Figs 38.60A and B)
These are the specimens of the uterus with tube and ovary of the right side. The ovarian cysts (right) are cut open to show inspissated sebaceous material, hair and other mature (mesenchymal) tissues. Teeth is present in about a third (see Figs 38.60A and B).

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy.

Diagnosis: Dermoid cyst of the right ovary.

Self-assessment

- Name the tissues arising from the three germ cell layers (see p. 239).
- Frequency of bilaterality and association with pregnancy (see p. 239).
- Common complications (see p. 243).

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Management in a young patient (see p. 244).
Risk of malignant change.
What are strumal carcinoids? (see p. 240).

**Q. How carcinoid tumors of the ovary are treated?**

**Ans.** Excision of the tumor (ovariotomy) causes rapid fall in the serum level of serotonin and disappearance of 5-hydroxyindole acetic acid in the urine. There is rapid remission of symptoms.

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**SPECIMEN—12**

**Description (Fig. 38.61)**

This is a specimen of the uterus with tubes and ovaries of both the sides. The left sided ovarian cyst is cut open to show many septa. There are few smaller cysts projecting inside.

**Operation done:** Total hysterectomy with bilateral salpingo-oophorectomy.

**Diagnosis:** Mucinous cyst adenoma.

**Self-assessment**

- Mention the common epithelial tumors of the ovary (see p. 237).
- Discuss the differential diagnosis of a pelvic abdominal lump.
- Clinical presentation of a benign ovarian tumor (see p. 240).
- Features of a functional cyst (see p. 235).
- How a benign ovarian tumor could be differentiated from a malignant one clinically?
- How laparotomy findings could be helpful to differentiate a benign tumor from a malignant one? (see p. 244).

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**SPECIMEN—13**

**Description (Fig. 38.62)**

This is a specimen of the uterus with tubes and ovaries of both the sides. The right ovary is hugely enlarged and cut opened to show its solid texture islands of yellow tissue separated by fibrous septa.

**Operation done:** Total hysterectomy with bilateral salpingo-oophorectomy.

**Diagnosis:** Solid ovarian tumor. Theca cell tumor of the ovary was confirmed on histology.

**Self-assessment**

- Mention the common solid tumors of the ovary.
  - **Benign:** Fibroma, Thecoma, Brenner tumor. Sex cord-stromal tumors.
  - **Malignant:** Primary ovarian carcinoma, dysgerminoma, carcinoid, immature teratoma, mesonephroma

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