FUNDAMENTALS OF COLPOSCOPY

Module objectives

- By the end of this module the trainee should be able to:
  - Define colposcopy and outline its indications
  - Identify equipment instruments used in colposcopy
  - Describe colposcopy procedure
  - Take colposcopic directed biopsy
  - Perform endocervical currettage

Approach to delivering the training:

- Classroom training.
- Clinic-based training.
- Both the components include the facilitated group learning activities for which the breakout groups should be formed

Training materials

- PowerPoint presentations,
- Digital images,
- Videos of producer
- Colposcope
- Instrument tray
- Coin or orange

Outline

1. Definition of colposcopy
2. Indications for colposcopy
3. Colposcopic Procedure
4. Common errors of colposcopy

What is colposcopy?

- **Colposcopy** is a gynecological procedure that illuminates and magnifies the vulva, vaginal walls and cervix in order to detect and examine abnormalities of these structures.

- It is also used to examine the anus and more recently the oropharynx as well as the penile epithelium, because each of these sites is prone to developing colposcopically recognizable precancerous lesions.

- Generally, It is a medical diagnostic procedure to visually examine any epithelial surface of the lower genital tract using a colposcope.

Common indications for colposcopy

1. A cytological abnormality
2. A positive high-risk HPV test in the presence of a low-grade or borderline smear abnormality or other screening test abnormality
3. Vulval intraepithelial neoplasia
4. Vaginal intraepithelial neoplasia
5. Anal /penile intraepthelial neoplasia

A systematic and adequate colposcopic examination by a properly trained colposcopist will nearly always recognize HSIL when cytology has heralded it and the report is known

Equipment used for a colposcopic examination

1. **Colposcope**
   - It's a microscope that has a range of magnification lenses with illumination at various low-power magnifications that allows examination of the cervix under light.
   - It consists of a uniocular or binocular microscope and light source, often incorporating a beam splitter to allow attachment of a still or video camera.
   - The colposcope head must be universally movable and should be easily fixed once in position, so as to allow the colposcopist freedom of hand movement.
   - The head comprises an objective lens; two eyepieces, which may be adjusted to each person's eye position and may be focused independently.

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- The colposcope head comprises an objective lens; two eyepieces, which may be adjusted to each person's eye position and may be focused independently; and a light source, which in the instrument shown comes from a light cable attached to a light source
- Most colposcopes have a green filter, which takes away the background redness so that the vessels appear black and fine vessel changes may be more easily appreciated

2. Examination Couch

- It may be elevated and flattened independently.
- A waste receptacle is fitted just below the patient's perineum.
- The examination table allows the woman to be placed in a modified lithotomy position.
- The woman's feet may be placed either in heel rests or the legs may be supported in knee crutches.
- Couches that can be moved up or down mechanically or electrically are more expensive and are not absolutely necessary either for colposcopic examination or to carry out treatment procedures guided by colposcopy.

3. Computerized Data Management System

- Many companies provide a software package that allows socio demographic, clinical, colposcopic, and laboratory data and image capture as well as automatic audit of colposcopic diagnostic performance.

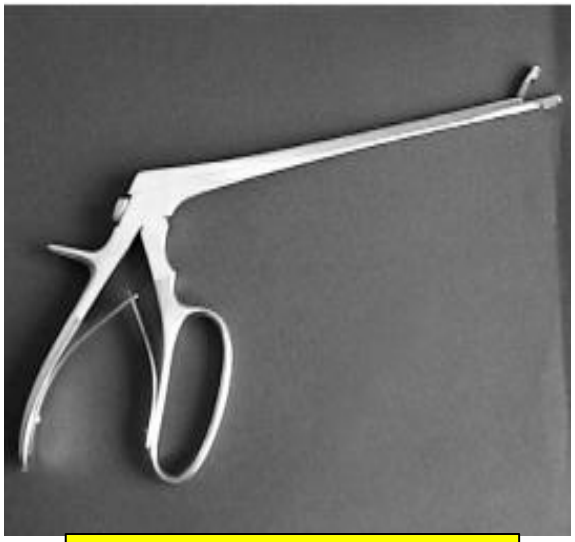
- In this way, it is relatively easy to create a full audit of performance for an individual Colposcopist and to maintain a clinical database for the clinic service. However, the programs are expensive.

4. Instrument Trolley

- Kidney tray
- Bottles with normal saline, 5% acetic acid and Lugol's iodine
- Monsel's solution
- Bottle containing formaline
- Local anaesthetic syringe
- Jar containing alcohol for cervical smear fixation
- Cotton-tipped fine swab sticks
- Cervical cytology brushes
- Larger cotton-tipped swab sticks
- Vaginal speculum
- Sponge-holding forceps
- Vaginal side-wall retractor
- Endocervical speculum
- Endocervical curette
- Dissecting forceps
- Punch biopsy forceps

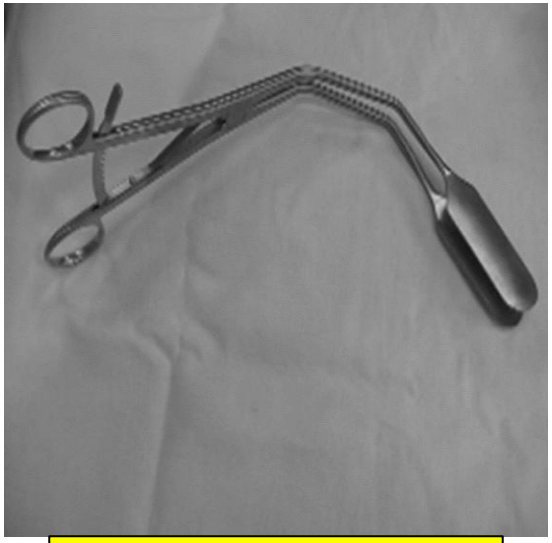
FIGURE 4.3: Colposcopy instrument tray

1: Kidney tray
2: Bottles with normal saline, 5% acetic acid and Lugol's iodine
3: Monsel's solution
4: Bottle containing formaline
5: Local anaesthetic syringe
6: Jar containing alcohol for cervical smear fixation
7: Cotton-tipped fine swab sticks
8: Cervical cytology brushes
9: Larger cotton-tipped swab sticks
10: Vaginal speculum
11: Sponge-holding forceps
12: Vaginal side-wall retractor
13: Endocervical speculum
14: Endocervical curette
15: Dissecting forceps
16: Punch biopsy forceps

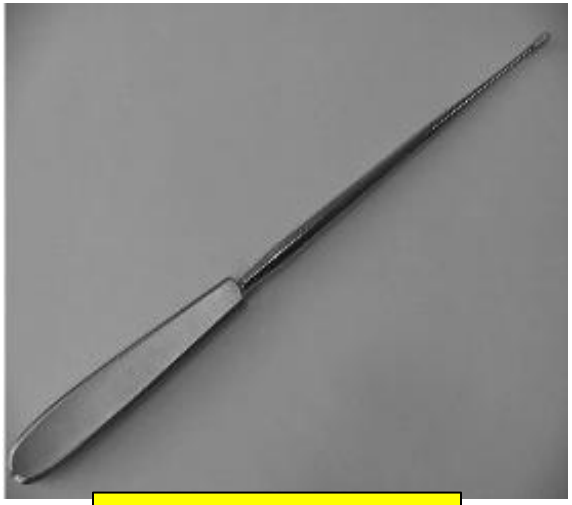


Cervical punch biopsy with sharp cutting edges

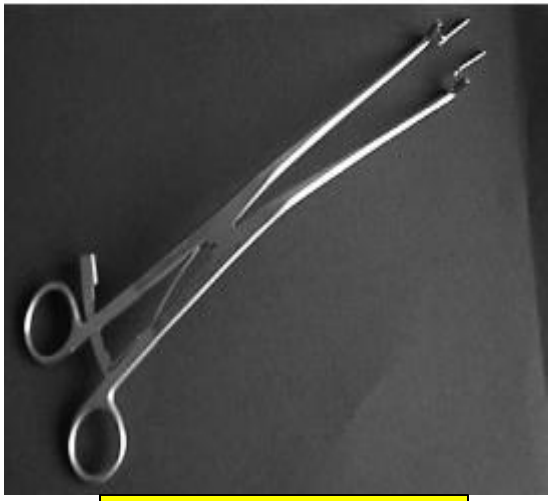
Loaded dental syringe



Vaginal wall retractors



Endocervical Curettage



Endocervical Speculum

COLPOSCOPIC EXAMINATION STEP-BY-STEP

1. Obtain a relevant medical history

- The woman's medical history is usually taken after her written informed consent has been obtained. Most women are referred after a screening examination, and it is ideal to have the result of the screening test available at the time of colposcopic examination.

- Relevant obstetric and gynecological history and history of any relevant exposures (e.g., number of pregnancies, last menstrual period, history of oral contraceptive use, hormonal supplements, sexually transmitted infections, etc.) should be obtained and recorded with the aid of a form designed for this purpose.

- If the woman has been referred because of abnormal cytology results, it is ideal to have a written copy of the previous smear(s) on hand at the time of the colposcopy appointment.

2. Explain the procedure to the woman

- Women referred to a colposcopy clinic may not have had the procedure explained to them in detail before their arrival.
- For literate women, pamphlets on what an abnormal cervical cytology or other screening test means and an explanation of the colposcopic examination may be helpful.
- Colposcopic examination may prove difficult and yield suboptimal results if the woman does not relax during the procedure.
- Privacy during the consultation and examination is of utmost importance.

3. Obtain informed consent

- After the procedure has been explained to the woman, written informed consent should be obtained before colposcopy.
- The written consent form should include information about the colposcopic examination and the usual procedures that may accompany it, such as biopsy, endocervical curettage and imaging. Summarize the possible complications that may occur.

4. Insert the vaginal speculum and inspect the cervix

- It is important to ask the woman to relax.
- The woman should be in a modified lithotomy positioning an examining table with heel rests, or stirrups or knee crutches. It is preferable to place the buttocks slightly over the end of the table.
- Positioning the buttocks in this way makes it much easier to insert the speculum.
- After exposing the cervix, one should assess the nature of the cervico-vaginal secretions and note any obvious findings such as ectropion, polyp,nabothian follicles, atrophy, inflammation and infection, leukoplakia(hyperkeratosis), condylomata, ulcer, growth and any obvious lesions in the vaginal fornices.
- Any excess mucus should be removed gently from the cervix with saline-soaked cotton swabs.
- Swabbing with dry cotton balls is discouraged, as these may induce traumatic bleeding and sub epithelial petechiae.

5. Apply normal saline solution

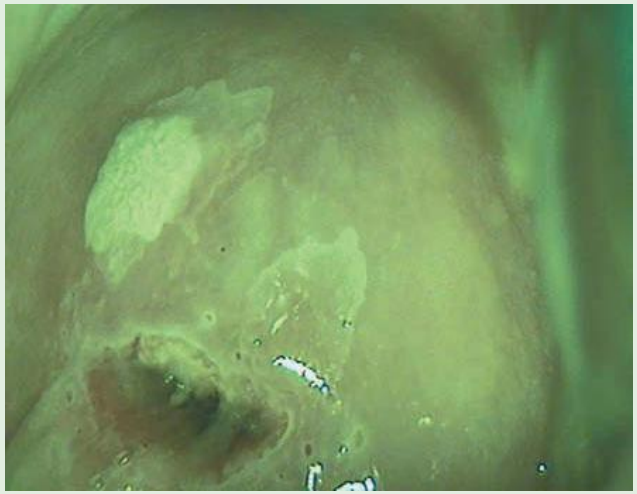
- Normal saline is applied to the cervix with a sprayer or cotton balls and excess liquid is removed afterwards. The cervix is examined grossly. This is the best way to conduct a preliminary inspection for surface abnormalities (e.g., leukoplakia, condylomata), and to examine the detail of cervical blood vessels.

Colposcopic image of a normal transformation zone (TZ).

Focus using Green Filter

- The best opportunity to evaluate any abnormal vasculature patterns is to use the **green filter** and **higher-power magnification** before the application of acetic acid. This effect, though may obscure some or all the changes, especially in an acetowhite area.

- The abnormalities of interest are punctation, mosaics and atypical vessels.



6. Apply acetic acid

- This step may be carried out using 3-5% dilute glacialacetic acid.

- The two main purposes of applying acetic acid are, first, to conduct another inspection of the entire new squamocolumnar junction and second, to detect and evaluate any areas of typical (normal) or atypical (abnormal)transformation zone (ATZ).

- Acetic acid should be liberally applied to the cervix with a cotton-tipped swab or cotton balls or using a 2 x 2 inches gauze or with a sprayer so that it covers the entire cervical surface, including the external os. After the colposcopic examination, the following should be documented:

a) Determine whether there is inflammation.

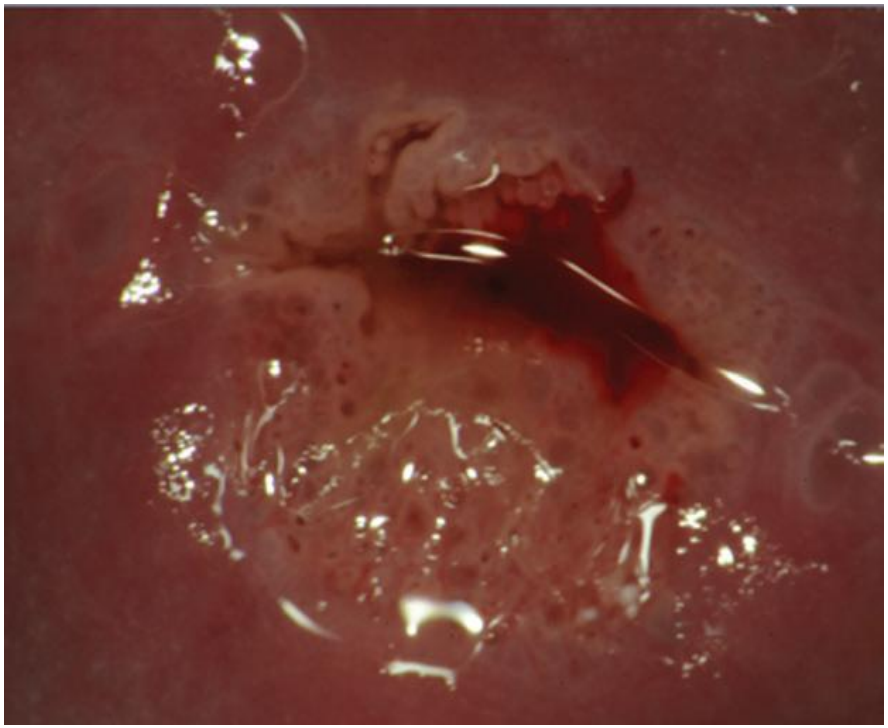
- If there is any evidence of infection (viral, fungal, bacterial), treatment should be given before any colposcopic examination is done.

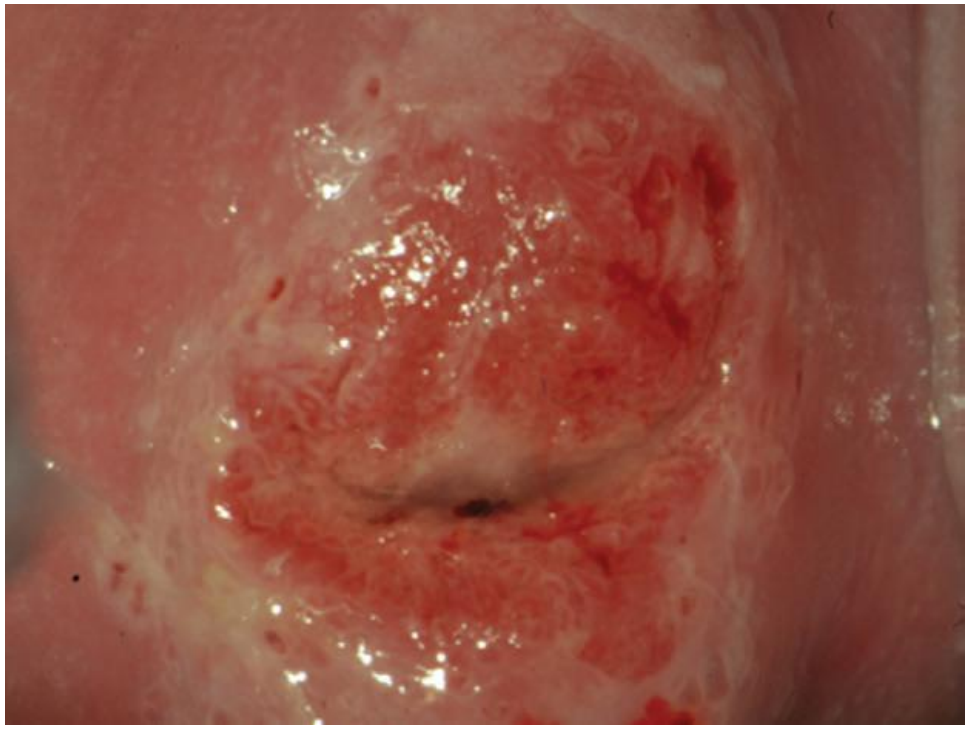
- **Confirm full visibility of the entire cervix under colposcopic view**. If the vaginal walls are collapsing, use a vaginal retractor or improvise using a condom over the speculum to hold back the vaginal walls.

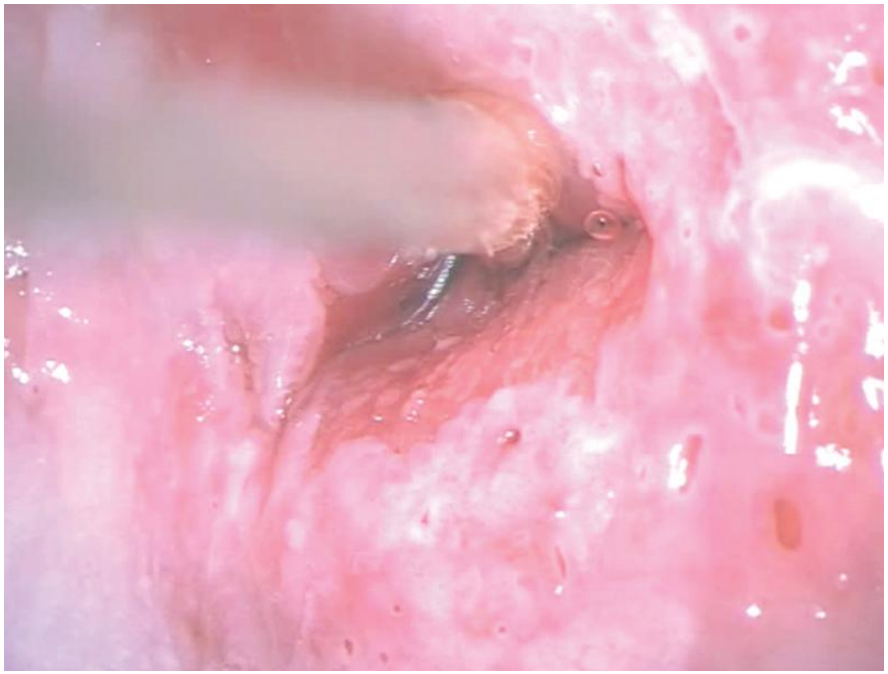
b) Determine the type of the TZ

- **Type 1 –** It is completely ectocervical, Is fully visible and may be small or large.
- **Type 2 -** Has endocervical component, Is fully visible and may have ectocervical component which may be small or large.
- **Type 3 -** Has endocervical component and is not fully visible.

Type 1 TZ



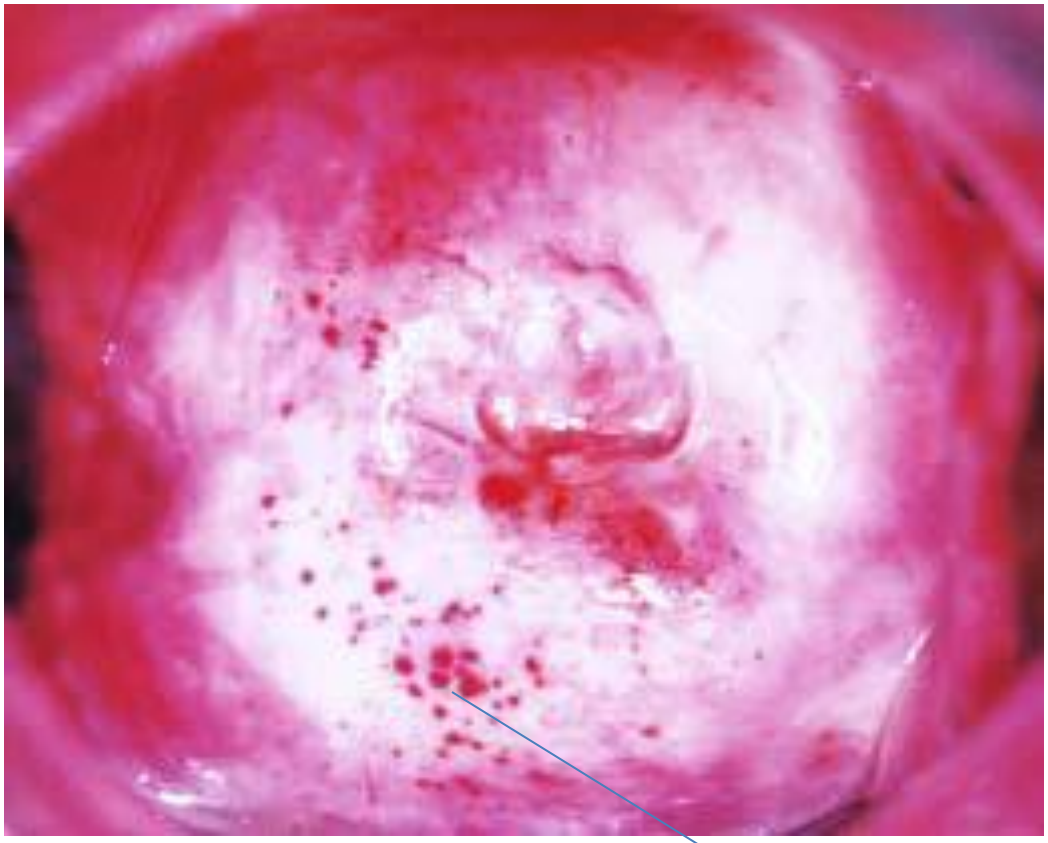




The upper limit of the TZ is easily seen on the posterior lip but is visible in the canal only with the aid of a cotton swab.

The upper limit of the TZ cannot be seen, because it extends into the canal above the field of view

Postmenopausal cervix: The epithelium is pale, brittle and lacks lustre, showing sub-epithelial petechiae Squamocolumnar junction is not visible



PETECHIAE HAEMOORHAGE

c) Determine and recognize epithelial abnormality (i.e., is disease present?). If possible, compile the swede score

i. Low grade lesion

ii. High grade lesion

iii. Suspicious for cancer

d) If possible, take a video or a number of images of the examination findings so as to record:

a. the TZ type

b. the site(s) of greatest abnormality

c. the site of any biopsy

d. the treatment, if performed.

5. Apply lugols iodine and examine

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a. the TZ type

b. the site(s) of greatest abnormality

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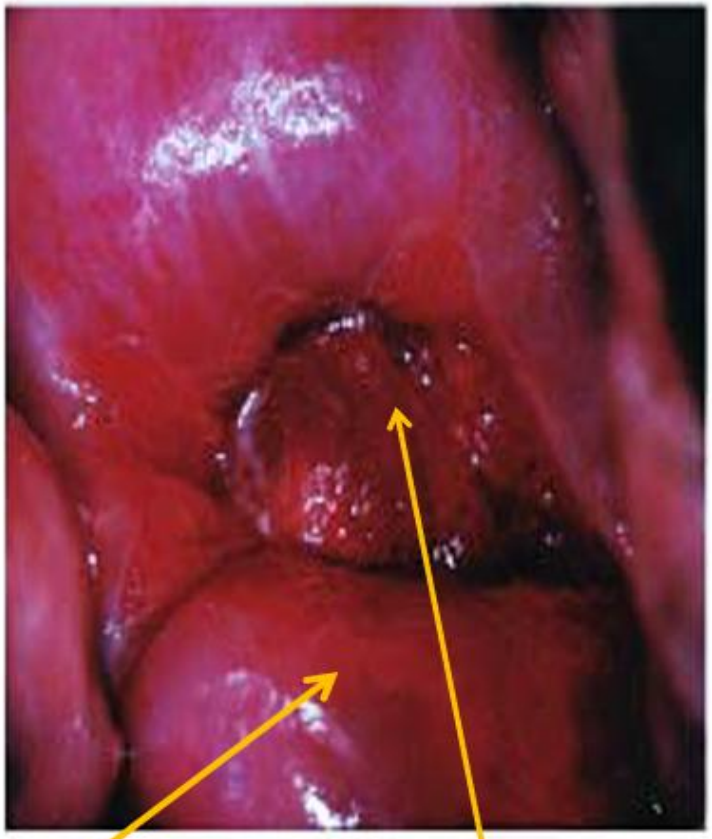
d. the treatment, if performed.

5. Apply lugols iodine and examine

LUGOL'S APPLICATION

- Normal squamous (both original and mature metaplastic) epithelial cells contain stores of glycogen that give a mahogany brown or nearly black stain when an iodine-containing solution, such as Lugol's, is applied.
- Similarly, immature squamous metaplasia, inflammatory and regenerating epithelium and congenital transformation zone contain very little or no glycogen and either do not or only partially stain with iodine.
- Condylomata also either do not or only partially stain with iodine.
- Abnormal transformation zones, such as those with CIN or invasive cancer, contain very little or no glycogen.
- Therefore, one would expect to see a range of staining from partially brown to mustard yellow across the spectrum from low- to high-grade CIN.

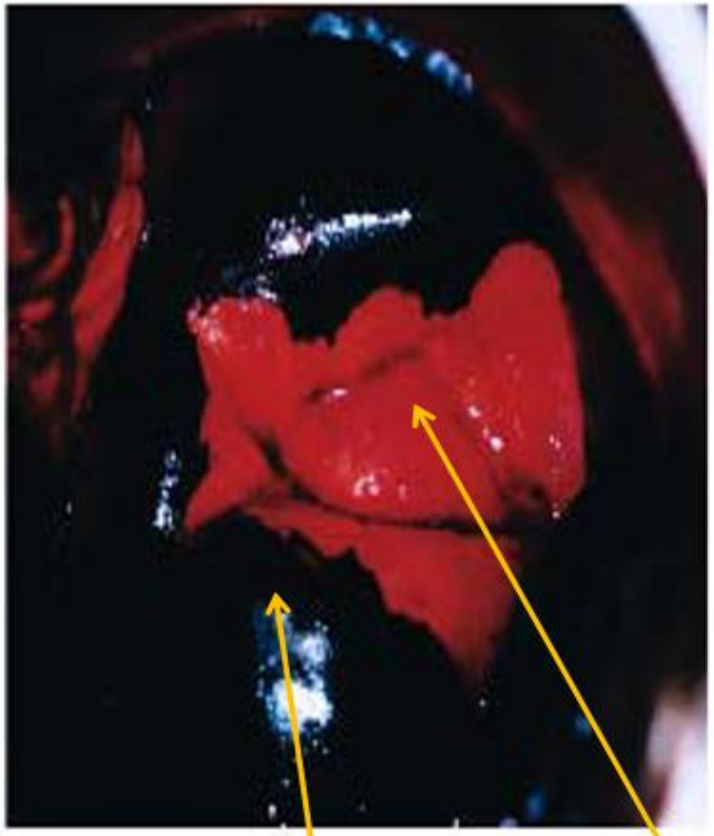
Before application of Lugols Iodine



Squamous Epithelium

Columnar Epithelium

After application of Lugols Iodine



Squamous Epithelium

Columnar Epithelium

Colposcopic features suggestive of:

Low Grade Lesions	High Grade Lesions
• A smooth surface with an irregular outer border. • Slight acetowhite change, slow to appear, and quick to disappear. • Mild, often speckled iodine partial positivity. • Fine punctation and fine regular mosaic.	• Irregular surface, erosion, or ulceration. • Dense acetowhite change. • Wide irregular punctation and mosaic. • Atypical vessels.

7. Perform cervical biopsies, if necessary

- Once an abnormal transformation zone is detected, the area is evaluated and compared with other areas of the cervix. It is essential to obtain one or more directed punch biopsies from areas colposcopically identified as abnormal and/or doubtful.

- Biopsy should be obtained from the area of the lesion with worst features and closest to the squamocolumnar junction.

- Biopsy always should be done under colposcopic control by firmly applying the biopsy instrument with the jaws wide opento the cervical surface to be sampled.

8. Perform endocervical curettage, if necessary

- There are three commonly encountered circumstances, in which an endocervical curettage (ECC) should be performed using an endocervical curette:
  - If the colposcopic examination of the ectocervix has not revealed any abnormality, though the woman has been referred because of a cytological abnormality, an ECC should be performed to properly evaluate the endocervical canal, which may contain a hidden invasive cancer or other lesion.
  - If the referral cytology indicated that a glandular lesion may be present, an ECC should be performed (regardless of the findings of the colposcopic examination).
  - If the colposcopic examination has been unsatisfactory (whether a cervical lesion is seen or not).

9. Explain the findings to the woman and thank her for her cooperation

- After the woman has dressed, carefully explain the examination findings and offer her the opportunity task questions.
- Review the management plan, emphasize the importance of adequate follow-up, and discuss any barriers to compliance.

10.Document the findings

- The findings of the colposcopic examination should be recorded with the aid of appropriate forms that are filed in such a way as to be easily retrievable.

Avoiding errors in the colposcopic assessment

- A thorough knowledge of anatomy, pathophysiology and natural history of diseases of the female genital tract is essential to avoid errors in colposcopic assessment.
- Strict adherence to a diagnostic protocol and an awareness of the limitations of colposcopy are equally important.
- Regular interaction with the pathologists and clinical audits help to improve the quality of colposcopy.

KEY POINTS

1. Colposcopy is an **assessment** and **diagnostic tool** and offers the best way to manage women with suspected cervical precancer.
2. A colposcopic examination should be **systematic** and **structured** and should always record the adequacy of the examination, the size and type of the transformation zone and the degree of abnormality as reflected in an objective diagnostic scoring system i.e., the Swede score.
3. When quality-assured, colposcopic examination has a **high negative predictive value**.
4. **Excisional therapy** for cervical precancer should always be performed under colposcopic vision.
5. Colposcopy is appropriate in women with **cytological abnormality**.
6. Women attending for colposcopy should be adequately **informed and counseled**.
7. Dedicated facilities for colposcopy are ideal with appropriate back-up facilities.
8. There needs to be good communication channels between the cytology, colposcopy, histopathology services.
9. Accurate **documentation** is necessary.
10. **Digital image storage** is recommended or other form of image capture.