Some Aspects of Colposcopy, or Do you see what I see?
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Definition

- **Colposcopy** is a diagnostic procedure in which a dissecting microscope is used to provide an illuminated, magnified view of the cervix, vagina, and vulva.

A bit of History...

- 1925–Hinselmann first described use of intense light and binocular microscope in order to examine cervix and vagina
- Application of acetic acid
- Description of punctuation, mosaicism
- Schiller developed the iodine test
A bit of Terminology...

- Transformation zone = area of the cervix where columnar epithelium coexists with squamous metaplasia in various stages of maturity

- White epithelium (former term - leukoplakia) is graded according to the degree of whiteness, the focality of the area, and the degree of extension above the surrounding normal epithelium
- Grade 1 is cloudy, whitish-pink
- Grade 3 is densely chalky white
- Condylomatous pattern: WE forms islands on the ectocervix with micropapillary pattern with red punctation at the tip of each projection
- Puncture pattern: from fine to coarse
- This pattern consists of dots that are created by the upward course of blood vessels that are squeezed by proliferating blocks of neoplastic cells
Mozaic pattern: begin as punctation, with groupings of capillaries that outline proliferating blocks of tissues. Although mozaic patterns typically are seen in association with neoplasia, they also are seen in association with metaplastic processes, especially in women exposed to DES.
### Clinical Considerations Directing Colposcopy

- **Clinical Objectives**
  - Provide a magnified view of the lower genital tract
  - Identify a transformation zone
  - Detect lesions suspicious for neoplasia
  - Direct biopsy of lesions
  - Monitor patients with a current or past history of low genital tract neoplasia

- **Clinical Indications**
  - Grossly visible genital tract lesions
  - Abnormal cervical cytology
  - History of in utero DES exposure

- **Contraindications**
  - Absolute—none
  - Relative—Anticoagulant Tx if patient requires biopsy
  - Upper or lower reproductive tract infection
  - Uncontrolled severe hypertension
  - Uncooperative or overly anxious patient

### Preparation

- H&P review, confirmation of indications for colposcopy
  - Accent on allergies, medications, prior cervical cytology, immunosuppressive conditions, previous cervical procedures
- Informed consent
- Pregnancy test
- All necessary equipment and supplies
- Assistant

### Colposcope

- Most have a focal length of 30 cm
- Magnification can range from 7.5 to 30
- Coarse focusing is performed by moving the colposcope toward or away from the patient, fine focusing—by turning the knob
Procedure

- Dorsal lithotomy
- Visual examination of vulva
- Largest speculum possible to visualize the entire cervix and vaginal fornices
- Repeat cervical cytology if more than 6 weeks

Solutions

- Normal Saline
- Acetic Acid—mucolytic agent that reversibly clumps nuclear chromatine, and dehydrates cells causing lesions to show various shades of white depending on the degree of density of an abnormal chromatine.
- Lugol—stains mature squamous epithelial cells mahogany in estrogenised women

Green (or blue) Filter

- Accentuates abnormal vessels by darkening and sharpening the contrast between them and the surrounding epithelium

Biopsy

- Tischler biopsy forceps
Bleeding...
- Monsel = ferric subsulfate
- Silver Nitrate

Endocervical Speculum

ECC
- ... if ASC-H, HSIL, AGC, AIS; ASCUS/LSIL but no visible lesion, unsatisfactory colposcopy
- not in pregnancy
Documentation

- Consistent and reproducible way
- Common terminology and abbreviations are noted on the diagram
- Pictures

Complications

- Bleeding
- Infection
- Failure to identify the lesion

Follow-up

- What to expect after procedure
- Precautions
- Verbal and written instructions as to how and when to receive results

Efficacy

- Among experienced colposcopists, there is good interobserver agreement for normal epithelium, HSIL, and invasive ca.

- There is more interobserver variation in diagnosis of LSIL; however, this lack of agreement is also true for the interpretation of a histopathology.
Using histology as the “gold standard”, a meta-analysis concluded the sensitivity of colposcopy for detecting any degree of CIN was 96%; but the specificity was fairly low at 48%.

The sensitivity dropped to 85%, but the specificity increased to 69%, when the threshold for abnormal was HSIL or cancer.

There was even lower sensitivity reported in subsequent studies (55%) for CIN II or greater. One recognized explanation was that AWE is most often observed anteriorly and posteriorly, even in the absence of CIN; however, CIN may be similarly distributed in all 4 quadrants.

To increase sensitivity...

- Perform 2 biopsies

Vaginoscopy

- Natural ruggae make the procedure more time consuming and difficult
- A systematic approach, working in 4 quadrants with applying acetic acid repeatedly noted to be helpful.
- The site of the lesion is documented using the vaginal apex, urethra and fourchette as landmarks.
**Vulvoscopy**

- **Indications:**
  - visible lesion(s)
  - no abnormalities of the cervix or vagina that can explain the abnormal cervical cytology
  - focal vulvar itch without a clear etiology

**Training**

- ACOG, AAFP, and ASCCP have developed curricula for the training of colposcopists.

  - Estimates of the number of colposcopies that need to be performed to gain competence range from 25 to 100, including a min of 10 with high-grade lesions.

**Alternatives**

- Colposcopy is the “gold standard” in the US for diagnosing CIN following abnormal cytology. It is resource intensive and not cost-effective as a screening tool.
- The other modalities include visualization techniques and technologies utilizing electronic detection methods (e.g., Polarprobe and in-vivo Spectroscopy)
- 4 quadrant biopsy

**Visualization Techniques**

- Direct visual inspection (DVI) following acetic acid application
- Speculoscopy is similar to DVI except that a blue-white chemiluminiscent light source is attached to the upper speculum blade
- Cervicography—standardized photography of the cervix after the application of AA. The 35 mm magnified images can then be interpreted by qualified evaluators in the world
- *Low specificity and PPV*
Electronic Screening Techniques

- Polarprobe and TruScan utilizes the principle that both normal and abnormal cervical tissue have characteristic electrical and optical properties which can be measured using a combination of various light and electronic frequencies. The probe is placed onto the surface of the cervix and signals are transmitted between the cervix and the portable console. The emitted tissue "signals" are then compared algorithmically with known signals stored in a databank of cervical tissue types. Trials are currently underway analyzing its efficacy as a screening modality.

Spectroscopy

- Relies on the principle of differential light emission by various tissue types. The targeted tissues have an "optical signature" determined by the amount of light they absorb and emit. Biochemical and structural changes that underline properties of various tissue types permit detection of the differences between normal and abnormal cervical tissues using a specialized fluorescent probe.

- In comparative trials of fluorescence spectroscopy versus colposcopy and other diagnostic techniques, spectroscopy performed better. However, this technology is still under development and further clinical trials will be required to determine true performance.

CRYOSURGERY

- Advantages
  - favorable safety profile
  - outpatient procedure
  - no anesthetics required
  - ease of procedure
  - low-cost equipment with minimal maintenance
  - rare bleeding complications
  - no proven adverse reproductive effects
  - acceptable primary cure rate
**LEEP**

- Disadvantages
  - no tissue specimen
  - cannot treat lesions with unfavorable sizes or shapes
  - uterine cramping
  - potential for vasovagal reaction
  - profuse vaginal discharge after procedure
  - cephalad migration of squamocolumnar junction

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  - outpatient procedure
  - low cost of equipment
  - tissue specimen

**CKC**

- Disadvantages
  - thermal damage to margins
  - special training required
  - risk of procedure bleeding
  - theoretical risk of vapor plume inhalation

- Advantages
  - anesthetized patient
  - tissue specimen undamaged
  - enhanced patient support if hemorrhage is encountered
  - variety of instruments to individualize conization
Disadvantages

- potential for hemorrhage
- lengthier procedure
- postoperative discomfort
- general or regional anesthesia required
- OR setting
- high cost
- larger volume of cervical stroma removed
- increased risk of adverse reproductive outcomes

AGC = 0.5% of cervical pathology in routine cervical cancer screening
Clinically important as an association with high grade disease is higher comparing to ASCUS
AGC -> Colpo, ECC, EMB (> 35yo) HPV

Relationship of Atypical Glandular Cell Cytology, Age, and Human Papillomavirus Detection to Cervical and Endometrial Cancer Risks

cross-sectional study of women with AGC cytology (n=1,422)
Strengths & Weaknesses

- 23.7% of women with AGC cytology had missing histology diagnosis, an additional 21.5% were missing HR HPV results
- Loss to follow, +1% reported Pap tests outside of the system, change/loss of insurance
- All of these factors decrease the number of cases for evaluation, but none of them were recognized in association with increased risk of adverse histology

Possible Clinical Value

- 50 yo women with HR HPV–neg AGC, and negative workup, including an EMB, “escaped” malignancy lies in the endometrium rather than endocervix
- 50 yo with AGC, ECC and EMB both positive for adenocarcinoma. HPV HR screen can provide further guidance

Suggestions

- To include HPV HR testing with colpo, ECC, EMB to assist in the appropriate management of AGC cytology

References

- www.ASCCP.org
- www.uptodate.com