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President of Turkish Society for Colposcopy and Cervical Pathology
Member at Large EFC
PERFORMANCE OF COLPOSCOPY

86 articles meta-analysis

Actual sensitivity 87 % - 99 %
Specificity 23 % - 87 %

~ HPV testing

Mitchell MF et al Obstet Gynecol 1998 ;91:626
Indications for colposcopy

Evaluation of the woman with abnormal Pap test
- presence of LSIL (TBS=The Bethesda System) /
- mild dyskaryosis/borderline nuclear changes (BSCC=British Society for Clinical Cytology)
- presence of HSIL / moderate to severe dyskaryosis
- presence of glandular abnormality
- any suggestive of invasive cancer

High risk HPV

With naked eye examination unhealthy Cx-vagina suspicious Ca

Presence of keratinized cells

Persistent unsatisfactory smears

Persistence of inflammatory cells despite adequate treatment

Contact bleeding, intermenstrual and irregular bloodstained vaginal discharge, hypertrophied T/Z

Monitoring of women treated for CIN

Evaluation of women with VIN or VaIN
Hans Hinselmann    1925

in old Greek    Kolpos: hollow, womb, vagina

Skopos: look at

1884-1959
New colposcopes
Colposcope

• Magnification
  Range 2-40 x  (2 - 15 x)

• Working distance (focal length)
  Distance between colposcope and patient
  between 200 - 400 mm

• Light bulb: Halogen, LED (strong, white light)

• Green-filter

• Accessories
  – Camera, video,…
Colposcope and Colposcopy room
Equipment and Procedure

- Preparation
- Colposcope
- Specula
- Solutions
- Biopsy
- Hemostasis
- Documentation
Colposcopy is never an urgent procedure
Inform patient about procedure

Moment of cycle:
  Proliferative phase

Treat infections

Treat atrophy
Equipment

Colposcopy tray

- Vaginal specula in various sizes
- 3%-5% acetic acid
- Lugol’s iodine solution
- Cotton-tipped applicators
- Large cotton swaps and cotton balls
- Endocervical specula
- Biopsy forceps
- Endocervical curette
- Ring forceps
- Biopsy specimen containers
- Hemostatic agents
Specula Types:
- Collins
- Cusco
- Graves

Smoke suction
Smoke suction
Coated
Lateral vaginal wall retractors

Cer-view™

Tru-view™
The right position on a gynecologic cauch
The buttocks should be exactly on the edge of the table and the arms on the belly or alongside the body. Ask the woman if she’s relaxed and feeling alright.
The cervix can be drawn laterally should be moved toward with a cotton swab

Notice not to touch the cervix
Gland openings

- Gland opening
- Nabothian follicle
- Immature metaplasia
- Villi covered by columnar epithelium
Types of Transformation Zone

- **Type 1 TZ** completely ectocervical and fully visible and may be small or large
- **Type 2 TZ** has an endocervical component, is fully visible, and may have an ectocervical component that may be small or large
- **Type 3 TZ** has an endocervical component that is not fully visible and may have an ectocervical component that may be small or large
Type I TZ

- completely ectocervical and fully visible and may be small or large

Type II TZ

- has an endocervical component, is fully visible, and may have an ectocervical component that may be small or large

Type III TZ

- has an endocervical component that is not fully visible and may have an ectocervical component that may be small or large
Cx in a nulliparous woman on day 12 of the menstrual cycle showing a widely open os through which the cervical canal is easily seen.

Type 2 TZ

Acetowhitening of columnar epithelium papillae

Effect of iodine staining of the epithelia
Cx with eversion of columnar epithelium due to Cusco’s speculum showing fine punctations within columnar epithelium

After acetic acid
Fine punctations within metaplastic epithelium

After iodine staining

Type 3 T/Z
Satisfactory

Unsatisfactory

Mikro invasion

CIN 3

Endocervical invasive cancer
Unsatisfactory colposcopy
Menopause
Endocervical speculum

- Screw/knob handle
- No-lock handle
- Standard Ratchet handle
Endocervical speculum
Normal colposcopic findings
- Original squamous epithelium
- Columnar epithelium
- Normal transformation zone

Abnormal colposcopic findings
- Acetowhite epithelium
  - Flat
  - Micropapillary / microconvoluted
- Punctuation
- Mosaic
- Leukoplakia
- Iodine negative
- Atypical vessels

Colposcopically suspect invasive carcinoma

Unsatisfactory colposcopy
- SCJ not visible, inflammation, atropy

Miscellaneous
- Nonacetowhite micropapillary surface
- Exophytic condyloma
- Ulcer
I. Normal colposcopic findings
   - Original squamous epithelium
   - Columnar epithelium
   - Normal transformation zone

II. Abnormal colposcopic findings
   - Flat acetowhite epithelium
   - Dense acetowhite epithelium *
   - Fine punctation
   - Course punctation *
   - Fine mosaic
   - Course mosaic *
   - Iodine partial positivity
   - Iodine negativity *
   - Atypical vessels *

*Major changes

III. Colposcopic features suggestive invasive carcinoma

IV. Unsatisfactory colposcopy  SCJ or cervix not visible, severe inflammation, severe atrophy, trauma

V. Miscellaneous findings: Condylomata, Keratosis, Erosion, Inflammation, Atrophy, Deciduosis, Polyps.
The new IFCPC Nomenclature

2011 IFCPC Nomenclature
Accepted in Rio World Congress, July 5, 2011
Nomenclature Committee chairman: Jacob Bornstein MD
## 2011 IFCPC Nomenclature

### Accepted in Rio World Congress, July 5, 2011

Nomenclature Committee chairman: Jacob Bornstein MD

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### 2011 IFCPC colposcopic terminology of the cervix

<table>
<thead>
<tr>
<th>General assessment</th>
<th>Adequate/inadequate for the reason ... (i.e.: cervix obscured by inflammation, bleeding, scar)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Squamo-columnar Junction visibility: completely visible, partially visible, not visible</td>
</tr>
<tr>
<td></td>
<td>Transformation zone types 1, 2, 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Normal colposcopic findings</th>
<th>Original squamous epithelium:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Mature</td>
</tr>
<tr>
<td></td>
<td>• Atrophic</td>
</tr>
<tr>
<td></td>
<td>Columnar epithelium</td>
</tr>
<tr>
<td></td>
<td>• Ectopy</td>
</tr>
<tr>
<td></td>
<td>Metaplastic squamous epithelium</td>
</tr>
<tr>
<td></td>
<td>• Nabothian cysts</td>
</tr>
<tr>
<td></td>
<td>• Crypt (gland) openings</td>
</tr>
<tr>
<td></td>
<td>Deciduosis in pregnancy</td>
</tr>
<tr>
<td>Abnormal colposcopic findings</td>
<td>General principles</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Grade 1 (Minor)</td>
<td>Thin aceto-white epithelium, Irregular, geographic border</td>
</tr>
<tr>
<td>Grade 2 (Major)</td>
<td>Dense aceto-white epithelium, Rapid appearance of acetowhiteness, <strong>Cuffed crypt (gland) openings</strong></td>
</tr>
<tr>
<td>Non specific</td>
<td>Leukoplakia (keratosis, hyperkeratosis), Erosion Lugol’s staining (Schiller’s test): stained/non-stained</td>
</tr>
<tr>
<td>Suspicious for invasion</td>
<td>Atypical vessels</td>
</tr>
<tr>
<td>Miscellaneous finding</td>
<td>Congenital transformation zone, Condyloma, Polyp (Ectocervical/ endocervical) Inflammation,</td>
</tr>
</tbody>
</table>

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Solutions

- Saline
- Acetic acid: 3-5 %
  - Glacial acetic acid 3-5 ml + distilled water 97-95 ml
- Lugol
  - Potassium iodide 10 g + distilled water 100 ml
  - Add slowly 5 g of iodine crystals when shaking
  - Store in brown bottle
Saline

• Used to clean the cervix
  – Good view on vascular pattern
  – Green filter before using Acetic Acid:
    swelling of epithelium
Acetic acid (1)

Use after first inspection

3 %: ideal for cervix and vagina
5 %: more appropriate for vulva

– Apply acetic acid and leave it for 30-60 seconds
– Repeat if necessary

« Keep it wet »
Let the acetic acid ‘flow away’ (tilt speculum)
Aceto white changes reversible coagulation or precipitation of the nuclear proteins and cytokeratins
Normal and Atypical epithelium

Reflected light from stroma
(translucent pink)

Reflected light from epithelium
(opaque white)
• Increased nuclear proteins:
  – immature squamous metaplasia
  – congenital transformation zone
  – in healing and regenerating epithelium (associated with inflammation)
  – Condyloma  HPV infection
  – CIN
  – Adenocarcinoma in situ
  – Adenocarcinoma
  – Invasive squamous carcinoma
Before 3% acetic acid application

After 3% acetic acid application

Columnar epithelium
Before Acetic acid

CIN 3

After acetic acid
A cervical lesion of the posterior cervical lip after 3% acetic acid application and with the green filter.
Lugol

Schiller’s iodine test

• Iodine is glycophilic
  – original and newly formed mature squamous metaplastic epithelium is glycogenated
  – CIN and invasive cancer contain little or no glycogen
  – Immature squamous metaplastic epithelium contains also little or no glycogen
CIN 3
Lugol (2)

• False positivity is high
• Time consuming process
• Use at the end of the colposcopy, before biopsy

May help in delineating the anatomical extent of abnormal areas much more clearly

(before conization or LEEP)
Acetic acid

Smear: L SIL
Colposcopy: CIN II
Schiller positive
Specific Colposcopic Features

Degree of acetowhiteness
Margins
Surface contour
Vascular pattern
CIN 1
Slight shiny; semitransparent

CIN 3
Very dense white; oyster white
After 1 minute of acetic acid application

After 3 minutes

CIN 3

After 5 minutes
MARGINS

Sharpness
Shape
Thickness of the border
Presence of internal margins
LOW-GRADE/MINOR LESIONS

Irregular
Feathered
Angular
Geographic
Indistinct

Satellite lesions
Exophytic micropapilliferous condyloma-like lesions
L SIL
SEVERE/HIGH GRADE ABNORMALITIES

Distinct raised edge
Within larger low-grade lesion:
internal margin or demarcation
CIN-3
H SIL  CIN-2
SURFACE CONTOUR

Smooth
Papillary
Nodular
Uneven
Ulcerated
Smooth surface  CIN I
Green filter;  Nodularity
Bx:Invasive  Cx Ca
VASCULAR PATTERNS

Punctuation
Mosaic
Atypical vessels
Intercapillary distance
Hinselmann watercolor of mosaic (Mosaic leukoplakia or Felderung) and punctuation (Ground leukoplakia or Leukoplakieground)
Punctuation
Diffuse punctation on vagina and cervix

Inflammation
Fine punctation  uniform  CIN 1

Course punctation  dilated capillaries, large intercapillary distance  CIN 3
Mosaic
Fine mosaic
Immature metaplasia or CIN 1

Course mosaic
Dilated vessels, increased intercapillary distance
More irregular pattern  CIN 3
ATYPICAL VESSELS

Terminal vessels, irregularities in shape, course, density, caliber, spatial arrangement.

Intercapillary distance is larger.
Atypical vessels and histologic diagnosis

<table>
<thead>
<tr>
<th>Histologic diagnosis</th>
<th>Atypical vessels %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benign lesions</td>
<td>0.6</td>
</tr>
<tr>
<td>Dysplasia</td>
<td>0.7</td>
</tr>
<tr>
<td>Carcinoma in situ</td>
<td>16.7</td>
</tr>
<tr>
<td>Early invasive carcinoma</td>
<td>76.9</td>
</tr>
<tr>
<td>Invasive carcinoma</td>
<td>96.6</td>
</tr>
</tbody>
</table>
Normal vessels like a tree
large to thin

Nabothian cyst

Cervical polyp
Atypical vessels
Glomeruloid hairpin, Commas, Corkscrew, Waste paper, Spaghetti form
Tendril, Waste-thread
keratosis (formerly leukoplakia)
keratosis    Bx: CIN 3
Grade 1 (insignificant, not suspicious)

acetowhite epithelium,
usually shiny or semitransparent,
borders not necessarily sharp,
with or without fine-caliber vessels,
often with ill-defined patterns,
absence of atypical vessels,
small intercapillary distance

metaplastic epithelium
(immature, mature, acanthotic);
SPI; CIN 1
Grade 2 (significant, suspicious)
acetowhite epithelium with greater opacity
with sharp borders,
with or without dilated-caliber, regularly shaped vessels,
absence of atypical vessels,
usually increased intercapillary distance

CIN 2;  CIN 3
Grade 3 (highly significant, highly suspicious)

very white or gray opaque epithelium with sharp borders,
dilated-caliber, irregularly shaped, often coiled, occasional atypical vessels,
increased but variable intercapillary distance,
irregular surface contour- microexophytic epithelium

CIN 3 ; early invasion
# THE COMBINED COLPOSCOPIC INDEX

<table>
<thead>
<tr>
<th>Colposcopic Sign</th>
<th>Zero Point</th>
<th>1 Point</th>
<th>2 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Margin</strong></td>
<td>Condylomatous or micropapillary contour</td>
<td>Regular lesions with smooth, straight outlines</td>
<td>Rolled, peeling edges</td>
</tr>
<tr>
<td></td>
<td>Indistinct acetowhiten ing</td>
<td></td>
<td>Internal demarcations</td>
</tr>
<tr>
<td></td>
<td>Flocculated or feathered margins,</td>
<td></td>
<td>between areas of</td>
</tr>
<tr>
<td></td>
<td>Angular, jagging lesions</td>
<td></td>
<td>differing appearance</td>
</tr>
<tr>
<td></td>
<td>Satellite lesions and acetowhiten ing that extends beyond T/Z</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>Shiny, snow white color</td>
<td>Intermediate shade (shiny grey)</td>
<td>Dull, oyster white</td>
</tr>
<tr>
<td></td>
<td>Indistinct acetowhiten ing</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vessels</strong></td>
<td>Fine-caliber vessels, poorly formed patterns</td>
<td>Absent vessels</td>
<td>Definite punctuation or mosaicanism</td>
</tr>
<tr>
<td></td>
<td>Condylomatous or micropapillary lesions</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Iodine</strong></td>
<td>Positive iodine staining</td>
<td>Partial iodine uptake</td>
<td>Negative staining of significant lesion</td>
</tr>
<tr>
<td></td>
<td>Minor iodine negativity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0-2: SPI or CIN1  
3-5: CIN I-II  
6-8: CIN II-III Aneuploid lesions
# THE MODIFIED REID COLPOSCOPIC INDEX

<table>
<thead>
<tr>
<th>Colposcopic sign</th>
<th>Zero point</th>
<th>1 Point</th>
<th>2 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Color</strong></td>
<td>Low intensity, indistinct, transparent acetowhitening</td>
<td>Intermediate shade-gray-white color and shiny surface</td>
<td>Dull, oyster-white</td>
</tr>
<tr>
<td></td>
<td>Acetowhitening beyond T/Z</td>
<td></td>
<td>Gray</td>
</tr>
<tr>
<td></td>
<td>Pure snow-white color with intense surface shine</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Margin</strong></td>
<td>Microcondylomatous or micropapillary contour</td>
<td>Regular shaped lesions with smooth, straight outlines</td>
<td>Rolled, peeling edges</td>
</tr>
<tr>
<td>&amp; surface</td>
<td>Flat lesions with indistinct borders</td>
<td></td>
<td>Internal demarcations between areas of differing appearance</td>
</tr>
<tr>
<td></td>
<td>Feathered or finely scalloped margins</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Angular, jagged lesions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Satellite lesions beyond T/Z</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vessels</strong></td>
<td>Fine/uniform caliber vessels, poorly formed patterns of punctuation and/or mosaic</td>
<td>Absent vessels</td>
<td>Well-defined coarse punctuation or mosaic, sharply demarcated</td>
</tr>
<tr>
<td></td>
<td>Vessels beyond T/Z</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fine vessels within condylomatous or micropapillary lesions</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Iodine</strong></td>
<td>Positive iodine staining, mahogany brown</td>
<td>Partial iodine uptake, tortoise shell</td>
<td>Negative staining, mustard yellow</td>
</tr>
</tbody>
</table>

0-2: LSIL - HPV/atypia  
3-4: Overlap  
5-8: HSIL
## Swede Score

<table>
<thead>
<tr>
<th>Sign</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aceto</td>
<td>0 or transparent</td>
<td>Shady, milky</td>
<td>Distinct</td>
</tr>
<tr>
<td>Margin status</td>
<td>0 or diffuse</td>
<td>Sharp but irregular, jagged, geographical</td>
<td>Sharp and even, difference in surface level including cuffing</td>
</tr>
<tr>
<td>Vessel pattern</td>
<td>Fine regular</td>
<td>Absent</td>
<td>Coarse or atypical vessels</td>
</tr>
<tr>
<td>Lesion size</td>
<td>&lt;5mm</td>
<td>5 – 15mm Or two quadrants</td>
<td>&gt;15mm or 3 – 4 quadrants or endocervically undefined</td>
</tr>
<tr>
<td>Iodine staining</td>
<td>Brown</td>
<td>Faintly or patchily yellow</td>
<td>Distinct yellow</td>
</tr>
<tr>
<td>Final score</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
GOLD STANDARD

in the diagnosis of cervical precancer

COLPOSCOPY

ASSOCIATED BIOPSY
Biopsy

• When?
  – When in doubt / to confirm view

• Where?
  – Most relevant spot
  – Transformation zone

• How
  – Firm bite

Avoid small biopsy
It should contain stromal tissue
Cervical punch biopsy forceps

Tischler-Morgan™

Euro-Med® rotating handle

Towsend™ rotating handle
Cervical Biopsy

Acetowhite epithelium
Hemostasis

- Do nothing waiting,
- Compression
- Silver nitrate (stick)
- Monsel
- Suture
Monsel

- Ferric sulfate base: 15 g
- Ferrous sulfate powder a few grains /
- Sterile water for mixing: 10 ml
- Glycerol starch 12 g
Endocervical curettes

Towsend™

Kevorkian Collector™
Documentation

• **Colpogram**
  – Satisfactory/unsatisfactory
  – Description of findings
  – Location of biopsies

• **Integration of cytology/colposcopy/pathology**
  – Delineation of treatment and follow-up
  – Inform patient and referring doctor
1881-1938
Bizimlesin
Sonsuza dek...

Thank you !!!!