Colposcopy
Tips and Trics

Kunter Yüce M.D
Professor and Head of Gynecologic Oncology
Hacettepe University, Ankara, Turkey
President of Turkish Society for Colposcopy and Cervical Pathology
Member at Large EFC
International Federation for Cervical Pathology and Colposcopy (IFCPC)
Colposcopic Classification 2002

II. Abnormal colposcopic findings:
   - Flat acetowhite epithelium
   - Dense acetowhite epithelium
     - Fine mosaic
   - Coarse mosaic
     - Fine punctuation
   - Coarse punctuation
     - Iodine partial positivity
   * Iodine negativity
   * Atypical vessels
   * Major changes
The new IFCPC Nomenclature

International Federation for Cervical Pathology and Colposcopy
Internationale Federation für Zervixpathologie und Kolposkopie
Federación Internacional de Patología Cervical y Colposcopia
Fédération Internationale de Pathologie Cervicale et Colposcopie

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**

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<table>
<thead>
<tr>
<th>2011 IFCPC colposcopic terminology of the cervix</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General assessment</strong></td>
</tr>
<tr>
<td>• Adequate/inadequate for the reason ... (i.e.: cervix obscured by inflammation, bleeding, scar)</td>
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<tr>
<td>• Squamo-columnar Junction visibility: completely visible, partially visible, not visible</td>
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<tr>
<td>• Transformation zone types 1, 2, 3</td>
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<tr>
<td><strong>Normal colposcopic findings</strong></td>
</tr>
<tr>
<td>Original squamous epithelium:</td>
</tr>
<tr>
<td>• Mature</td>
</tr>
<tr>
<td>• Atrophic</td>
</tr>
<tr>
<td>Columnar epithelium</td>
</tr>
<tr>
<td>• Ectopy</td>
</tr>
<tr>
<td>Metaplastic squamous epithelium</td>
</tr>
<tr>
<td>• Nabothian cysts</td>
</tr>
<tr>
<td>• Crypt (gland) openings</td>
</tr>
<tr>
<td>Deciduosis in pregnancy</td>
</tr>
<tr>
<td>Abnormal colposcopic findings</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>Grade 1 (Minor)</td>
</tr>
<tr>
<td>Grade 2 (Major)</td>
</tr>
<tr>
<td>Non specific</td>
</tr>
<tr>
<td>Suspicious for invasion</td>
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<tr>
<td>Miscellaneous finding</td>
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</tbody>
</table>

Abnormal colposcopic findings

**general principles**

**Location of the lesion**
- inside or outside the T/Z
- location of the lesion by clock position

**Size of the lesion**
- size of lesion in percentage of the cervix
- number of cervical quadrants the lesion covers
Location of the lesion

Location of the lesion is relative to the original SCJ

"Inside" location means medial to the SCJ (towards the cervical os)

A lesion within the T/Z, as opposed to one outside, has been shown to be an independent predictor of a high-grade lesion or carcinoma.
Localization of HGSIL

proximally located lesions are usually severe than others
Size of cervical lesions

1995 Kierkegaard:
lesion size has independent predictive value

1995 Hopman et al:
reported an inter-observer agreement rate of 68 %
when evaluating colposcopic photographs for lesion size

2005 Ferris:
size of cervical lesions correlates directly with the
disease grade

2007 Hammes:
Lesions > 50 % of cervix has higher probability
for high-grade lesion/carcinoma (OR, 3.45)
Size of the lesion

a. the number of cervical quadrants the lesions covers,
b. size of the lesion as a percentage of the cervix,
c. location of the lesion by clock position(s).

All three parameters are incorporated into the terminology because the parameters of size and location do not overlap; for example, a lesion can occupy three quadrants but be composed of a thin layer of abnormal epithelium that occupies only 5% of cervix. It may extend for the 2 o'clock to the 8 o'clock positions.
ASSESSMENT AND INTERPRETATION OF ABNORMAL COLPOSCOPIC FINDINGS

1. Response to acetic acid
2. Surface contour
3. Margin of lesion
4. Punctations, mosaic and intercapillary distance
5. Appearance of blood vessel
6. Iodine uptake
7. Keratosis
Acetic Acid Application

The degree of the whitening is correlated with the degree of the hystologic grade

The time and duration of whitening
How acetic acid works as a contrast agent?

can improve the surface light reflection by dissolving mucus

can modify cellular proteins, including cytokeratin and nuclear proteins

can dehydrates the cell which removes most of the cytoplasm. After dehydration the cell is left with organelles, cytoskeleton filaments and nuclear proteins (?)

The effects of acetic acid are transitory: when rehydration of the cell cytoplasm occurs, any protein alterations revert to their normal state.
CIN 1
CIN 1
Slight shiny;
semitransparent

CIN 3
Very dense white;
oyster white
Before Acetic acid

CIN 3

After acetic acid
HGSIL
Dens Acetowhite
The degree of the whiteness is correlated with the degree of the hystologic grade

The time of whitening is rapid and duration is longer compared to LGSIL

Dense acetowhite change appears early and is slow to resolve
After 1 minutes of acetic acid application

CIN 3

After 3 minutes

After 5 minutes
ASSESSMENT AND INTERPRETATION OF ABNORMAL COLPOSCOPIC FINDINGS

1. Response to acetic acid
2. Surface contour
3. Margin of lesion
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7. Keratosis
SURFACE CONTOUR

Smooth
Papillary
Nodular
Uneven
Ulcerated
Smooth surface  CIN I
Green filter;
Nodular appearance
ASSESSMENT AND INTERPRETATION OF ABNORMAL COLPOSCOPIC FINDINGS

1. Response to acetic acid
2. Surface contour
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MARGINS

Sharpness
Shape
Thickness of the border
Contrary to LGSIL, HGSIL have sharp and prominent contours. Rolled peeling edges may be associated with a high-grade lesion. Other edge definitions are feathered or geographical margin, usually associated with a low-grade lesion.
HGSIL

raised and prominent contours
Rolled peeling edges
ASSESSMENT AND INTERPRETATION OF ABNORMAL COLPOSCOPIC FINDINGS

1. Response to acetic acid
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Hinselmann watercolor of
mosaic (Mosaic leukoplakia or Felderung)
and punctation (Ground leukoplakia or Leukoplakieground)
Punctuation
Fine punctation
uniform CIN 1

Coarse punctation, dilated capillaries, large intercapillary distance
Mozaic
Fine mosaic
Immature metaplasia or CIN 1

Coarse mosaic
Dilated vessels, increased intercapillary distance
More irregular pattern CIN 3
Coarse punctuation

the coarser the punctuation,
the more likely the lesion is
high-grade CIN or cancer

This picture is
within the T/Z and usually within an area
of dense acetowhiteness
Coarse mosaic

The coarser, wider and more irregular the mosaic,
the more likely the lesion is

high-grade CIN or invasive cancer
Coarse punctuation
Coarse punctation (green filter)
Note the large caliber of the vessels, variable diameters, and asymmetry.
Note also, appearance of small atypical surface vessels
Coarse punctuation
CIN 3
Same cervix  two different magnifications  
irregular surface, dens acetowhite, coarse punctuation (CIN 3)
Coarse mosaic
Coarse mosaic
CIN 2
Coarse punctuation and Coarse mosaic
Coarse punctuation and Coarse mosaic
ASSESSMENT AND INTERPRETATION OF ABNORMAL COLPOSCOPIC FINDINGS

1. Response to acetic acid
2. Surface contour
3. Margin of lesion
4. Punctations, mosaic and intercapillary distance
5. Appearance of blood vessel
6. Iodine uptake
7. Keratosis
Atypical vessels

Abnormal Colposcopic Findings
Non-specific category

- Lugol staining
  Schiller’s iodine test
- Keratosis Leukoplakia
ASSESSMENT AND INTERPRETATION OF ABNORMAL COLPOSCOPIC FINDINGS

1. Response to acetic acid
2. Surface contour
3. Margin of lesion
4. Punctations, mosaic and intercapillary distance
5. Appearance of blood vessel
6. Iodine uptake
7. Keratosis
Lugol

Schiller’s iodine test

• Iodine is glycophilic
  – Original and newly formed mature squamous metaplastic epithelium is glycogenated
  – Immature squamous metaplastic epithelium contains little or no glycogen
  – Normal columnar epithelium has no glycogen
  – CIN and invasive cancer contain little or no glycogen
Lugol Solution Application

• **Iodine is glycophylic**

  Original, mature squamous metaplastic epithelium contains more glycogen, resulting in dark brown staining.

  Immature squamous metaplastic epithelium, CIN, invasive cancer does not contain or less glycogen, so they can’t stain.
Smear: L SIL
Colposcopy: CIN II

Acetic acid

Schiller positive
LGSIL
H SIL (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)
ASSESSMENT AND INTERPRETATION OF ABNORMAL COLPOSCOPIC FINDINGS

1. Response to acetic acid
2. Surface contour
3. Margin of lesion
4. Punctations, mosaic and intercapillary distance
5. Appearance of blood vessel
6. Iodine uptake
7. Keratosis
keratosis (formerly leukoplakia)

The term leukoplakia or keratosis may be considered a major lesion in the terminologies because keratosis is shown to have a 25% independent predictive value of containing high-grade or invasive neoplasia.
keratosis (formerly leukoplakia)
Keratosis
keratosis  Bx: CIN 3
<table>
<thead>
<tr>
<th>Feature</th>
<th>Low-Grade Lesion</th>
<th>High-Grade Lesions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Snow white to bright white</td>
<td>Bright white to dull (oyster) gray</td>
</tr>
<tr>
<td>Lesion size and shape</td>
<td>Relatively large and geographic; raised and papillary</td>
<td>Relatively small; smooth and flat</td>
</tr>
<tr>
<td>Location</td>
<td>Throughout the ectocervix</td>
<td>In the upper transformation zone at or near the new squamocolumnar junction</td>
</tr>
<tr>
<td>Time interval to color</td>
<td>Slow to change; requires numerous reapplications to</td>
<td>Rapid change; requires few reapplications to maintain color differential</td>
</tr>
<tr>
<td>change; number of</td>
<td>maintain color differential</td>
<td></td>
</tr>
<tr>
<td>reapplications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Border</td>
<td>Irregular; relatively indistinct</td>
<td>Straight, raised or rolled; prominent</td>
</tr>
<tr>
<td>Feature</td>
<td>Low-Grade Lesion</td>
<td>High-Grade Lesion</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Acetic acid change</td>
<td>Persistence of fine punctation/mosaicism</td>
<td>Loss of fine punctation/mosaicism Persistence of coarse punctation/mosaicism</td>
</tr>
<tr>
<td>Punctuation</td>
<td>Predominately fine (uniformly sized, relatively small dots confined to the surface epithelium; uniformly close intracapillary distance)</td>
<td>Predominately coarse (variably sized dots may float above the surface epithelium; variable intracapillary distance is increased overall)</td>
</tr>
<tr>
<td>Mosaicism</td>
<td>Predominately fine (uniformly sized small tiles encased by uniformly sized small vessels) Fine punctation is often present</td>
<td>Predominately coarse (variably sized large tiles encased by enlarged vessels that are of nonuniform caliber) Coarse punctation is often present</td>
</tr>
</tbody>
</table>
six classical graduating signs

coarse mosaic

coarse punctuation

dense acetowhite epithelium (opaquie)

rapid appearance of acetowhiteness (fast dynamics)

sharp border

negative iodine staining
Graduating

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color of acetowhite epithelium</td>
<td>fine / dens-opaque</td>
</tr>
<tr>
<td>Dynamics of whitening</td>
<td>slow / fast</td>
</tr>
<tr>
<td>Mosaic/punctuation</td>
<td>fine / course</td>
</tr>
<tr>
<td>Intercapillary distance</td>
<td>narrow / large</td>
</tr>
<tr>
<td>Border</td>
<td>feathered / sharp</td>
</tr>
<tr>
<td>Iodine staining</td>
<td>high / partial / negative</td>
</tr>
</tbody>
</table>
four colposcopic criteria of the abnormal TZ

inner border sign “border in border”
“lesion in lesion”

ridge sign

rag sign

cuffed crypt openings

They have significant validity as markers of high-grade cervical intraepithelial neoplasia
The inner border sign is a sharp demarcation between thin and dense acetowhite areas within the same lesion.

A dull, oyster white area, of the atypical TZ, inside a less opaque acetowhite area, in its turn demarcated from the normal squamous epithelium.
Atypical T/Z with inner border at 12 o’clock
After application of Schiller’s iodine the inner border is clearly demarcated

Histology: CIN III
Within larger low-grade lesion internal margin

CIN 3
“Lesion within a lesion”

dense white of a CIN3 lesion in the center near the cervical os,
faint acetowhiteness in the periphery – CIN1
Within larger low-grade lesion internal margin

1 LGSIL, 2 HGSIL
Within larger low-grade lesion  internal margin
Ridge sign

An opaque ridge (protuberance) at the area of a acetowhite epithelium within the T/Z

Ridge sign is an opaque lesion at the level of the squamo-columnar junction (SCJ) which resembles a mountain ridge

Ridge sign is a highly specific marker for CIN 2/3 for detection of CIN 2/3

- sensitivity 33.1%; specificity 93.1%

Women with ridge sign are significantly younger than women with no ridge sign (p< .001).

Ridge sign is associated with the presence of HPV 16 (p< .001).
New colposcopic sign - Ridge sign
An opaque acetowhite ridge at the squamocolumnar junction


Prof Jacob Bornstein
Ridge sign

the opaque protuberance that is present at the area of a white epithelium within the transformation zone.
Ridge sign
Signo de la cresta (imágenes acetoblancas sobrelevadas)

Ridge sign
Rag sign

Rag sign is a mechanical epithelial abrasion of an opaque acetowhite area of the atypical TZ, during either collection of the smear for cytology or HPV testing and/or applying acetic acid or Lugol’s solution.
Rag sign
Due to the mechanical trauma when applying Schiller’s iodine the epithelium is sloughed off described as rag sign
Histology: CIN III
Gland openings

T/Z with gland openings surrounded by fine rings of metaplastic acetowhite epithelium
Cuffed crypt (gland) openings

- Cells pile up
- Dysplastic squamous cells at mouth of glandular cyst
- Columnar cells

End on view
Cuffed crypt (gland) openings
opaque collar-like lesions
Cuffed crypt (gland) openings

opaque collar-like lesions inside an acetowhite area of the atypical TZ
Atypical transformation zone multiple cuffed gland openings between 4 and 9 o’clock.
GOLD STANDART
in the diagnosis of cervical precancer

COLPOSCOPY ASSOCIATED BIOPSY