# A Classification of Vulvoscopic Findings for Clinical Diagnosis

T. Audisio, Prof MD, J. Zarazaga, MD, and O. Vainer, MD
*Center for Uterine Cervical Pathology, Graduate School of Medicine, Córdoba National University, Córdoba, Argentina*

■ **Abstract:** *Objectives.* We describe vulvoscopic findings, their correspondence with certain pathological processes, and the grouping of vulvoscopic findings to facilitate clinical practice. *Materials and Methods.* We performed vulvoscopy on 2,352 patients and described what we saw. We then classified the images by groups, according to the diagnoses suggested. Finally, we compared the frequency of the different images as a function of the symptoms, the clinical and histological diagnoses, the history of cervical lesions (cervical human papillomavirus, cervical intraepithelial neoplasia, or cervical carcinoma), and the microbiological studies. *Results.* We found 2.33% human papillomavirus–vulvar intraepithelial neoplasia (HPV-VIN) type 1 lesions, 0.52% herpes simplex lesions, and 0.08% VIN2 lesions in asymptomatic patients without a history of cervical lesions. In 95% of patients in whom raised acetowhite patches were found on the skin, vaginal exudate revealed *Candida* species. The images showing cobbled mucosa and white and red punctation primarily suggested a nonviral infection, though a small percentage of cases were of viral origin. The history of cervical lesions was significant ($p < .000001$) in the HPV-VIN1 lesion group. For the diagnosis of more severe vulvar lesions (VIN3 and vulvar carcinoma), we found that the joint presence of pruritus and a history of cervical lesions was significant ($p < .004$). *Conclusions.* Vulvoscopy performed as a routine examination procedure enables the detection of some disorders in asymptomatic patients who lack a history of cervical lesions and precludes the need for histological studies in some cases, though in others the image is inconclusive and a biopsy is required. Given that a description of normal findings is available, we are able to eliminate suspect pathological processes through a vulvoscopic examination. The proposed classification can serve as a guide to diagnosis and therapy. ■

Reprint requests to: Dr. Teresita Audisio, Abel Chaneton 367, Córdoba, Argentina.


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The pathological alterations of the vulva consist of inflammatory, preneoplastic, and neoplastic lesions, nonneoplastic epithelial disorders, and tumors. A symptom common to all of these pathological processes is pruritus or a burning sensation, although many of these alterations present asymptomatically. With regard to the preneoplastic and neoplastic lesions, numerous authors [1–7] report that between 20% and 50% of their cases are asymptomatic vulvar intraepithelial neoplasia types 1 and 2 (VIN2 and VIN3), especially in young women.

Intraepithelial cervical, vaginal, and vulvar neoplasias can develop simultaneously, expressing multifocality or multicentricity, particularly when associated with human papillomavirus (HPV). Several authors [8–13] indicate the appearance of VIN simultaneously with or several years after a diagnosis of cervical intraepithelial neoplasia (CIN) is made and, on this basis, they recommend vulvar examination, either directly or by colposcopy, when cervical or vaginal lesions are present. However, Hammond [14] finds CIN subsequent to VIN, and Dexeus [15] reports 17 vulvar carcinomas in patients with no history of CIN or cervical carcinoma.

The possibility of asymptomatic lesions, the appearance of vulvar neoplasia without a history of cervical neoplasia, and the existence of lesions that can be observed only under certain conditions (e.g., by applying acetic acid or Lugol solution) and with specific devices would support the practice of vulvoscopy as a routine examination procedure. In this study, we performed vulvoscopy on women who came to the Center of Uterine

Cervical Pathology for routine examinations. We compared the findings observed with the symptoms, the history, and the results of histology and microbiology. From these relationships, we propose a classification and terminology for diagnosis.

## MATERIAL AND METHODS

This study was approved by the Human Research Committee of the Center of Uterine Cervical Pathology. Between 1994 and 1996, we performed vulvoscopic and colposcopic cervical and vaginal examinations on 3,496 patients. To address the relationship between CIN and VIN, we rejected those patients in whom white images were present on the cervix and a biopsy did not indicate CIN or condyloma (n = 1,144), reducing our sample number of patients to 2,352. The patients' age distribution was as follows: 17 to 19 years, 5%; 20 to 29 years, 30%; 30 to 39 years, 29%; 40 to 49 years, 22%; 50 to 59 years, 8%; 60 to 69 years, 5%; and 70 to 73 years, 1%.

We used a 16× colposcope. The first observation was made before 4% acetic acid solution was applied. After applying acetic acid, we waited 2 minutes, during which time some pathological findings appeared, particularly on skin areas. Then we applied 1% Lugol solution on the internal half of the inner surface of the labia minora, on the clitoris, and on the vulvovaginal vestibule. This procedure was used for all patients.

We performed a biopsy on all the lesions observed. We also performed biopsies on 100 of the 1,438 patients who did not present with observable lesions. For this group, we selected a convenient sample of 7% (1 of each 14 patients by order of arrival for consultation).

We performed direct cervicovaginal microbiological studies on all patients for detection of *Trichomonas vaginalis* and *Candida* species and cultures for *Trichomonas* (Trichum medium), *Candida* (Sabouraud), *Gardnerella vaginalis* (chocolate agar), staphylococci, and streptococci (blood agar). Patients whose vaginal exudate proved positive for certain microorganisms were treated, and we repeated vulvoscopy in 30 days. If the lesions persisted, we performed biopsies. Patients with vulvar ulcers or vesicles were tested for herpes simplex virus and *Treponema pallidum* (direct culture studies or diagnostic serum tests).

We photographed and described the vulvoscopic findings, named each finding, and calculated its absolute frequency. Then we classified the images into groups by their appearance and the suspected diagnoses that they implied.

To evaluate the correlation between the vulvoscopic images and the suspected diagnoses, we considered the following parameters: (1) the presence of pruritus; (2) a history of cervical HPV or CIN or cervical carcinoma (for the purposes of this study, referred to as a *history of cervical lesions*, or *HCL*); and (3) the patient's perception of vulvar lesions (PVL). Using these parameters, we classified the patients into five categories (Table 1).

The relative frequency of each vulvoscopic finding was calculated within each category. We also compared the percentages of vulvar condyloma, VIN, and vulvar carcinoma among the different categories. For this purpose, we used Epi INFO 6.0 (Centers for Disease Control, Epidemiology Program Office, Atlanta, GA) and data analysis by chi square. Probability values of less than .05 were considered significant.

## RESULTS

On the basis of our observations, we developed a classification system that links the description of the findings to the suspected diagnosis. The absolute frequency of each finding and the accumulated frequencies per group are indicated in Table 2.

### Classification and Description of Vulvoscopic Findings for Clinical Diagnosis

I. Normal findings
   - A. *Normal skin.* The skin surface is smooth, slightly pigmented, and covered with hair and adnexa, which sometimes are clearly visible.
   - B. *Smooth mucosa.* This is found on the inner surface of the labia minora and the vestibule. On direct observation, it is smooth and pink. After acetic acid is applied, the mucosa becomes paler, and a slightly keratinized area is defined clearly on the external half of the labia minora. The response to Lugol is positive

**Table 1. Formation of Categories**

| Categories | VP | HCL | PVL | n |
|---|---|---|---|---|
| A | Absent | Absent | Absent | 1,142 |
| B | Present | Absent | Absent | 794 |
| C | Absent | Present (80% CIN1) | Absent | 304 |
| D | Present | Present (90% CIN2, CIN3, or Ca) | Absent | 65 |
| E | | Present or Absent | Present | 47 |
| Total | | | | 2,352 |

VP = vulvar pruritus; HCL = history of cervical lesion [history of cervical human papillomavirus, cervical intraepithelial neoplasia (CIN), or carcinoma (Ca)]; PVL = perceptible vulvar lesions.

**Table 2. Vulvoscopic Findings: Absolute Frequency and Accumulated Frequencies per Group**

| Groups | Findings | Histopathology | Finding (%) | Groups (%) | n |
|---|---|---|---|---|---|
| I | Normal | Normal | 61.10 | 61.1 | 1,438 |
| II | Raised acetowhite patches | | 14.12 | 22.7 | 533 |
| | Smooth acetowhite mucosa | | 3.15 | | |
| | Raised yellow or white spotting | NI | 0.93 | | |
| | Red lesion | | 0.59 | | |
| | Fissures | | 3.44 | | |
| | Erosions | | 0.17 | | |
| | Tumors | | 0.30 | | |
| III | Cobbled mucosa | NI | 1.64 | 5.1 | 120 |
| | | HPV-VIN1 | *0.59 | | |
| | White spotting | NI | 0.46 | | |
| | | HPV-VIN1 | *0.04 | | |
| | Red spotting | NI | 1.99 | | |
| | | HPV-VIN1 | *0.38 | | |
| IV | Raised acetowhite mucosa | HPV-VIN1 | *0.68 | 6.0 | 141 |
| | Flowering papillary hyperplasia | HPV | *0.51 | | |
| | Exophytic lesions | HPV | *2.88 | | |
| | Spikes | HPV | *0.40 | | |
| | Vesicles and ulcers | HSV (lab.) | 1.53 | | |
| | | Lichen sclerosus | 0.48 | | |
| | | Squamous cell hyperplasia | 0.18 | | |
| V | White lesions | VIN1 | *0.13 | 5.1 | 120 |
| | | VIN2 | †0.04 | | |
| | | VIN3 | †0.17 | | |
| | | Lichen planus | 0.05 | | |
| | Mosaic | VIN1 | *0.17 | | |
| | Punctation | VIN3 | †0.04 | | |
| | Punctation | CaSI | †0.04 | | |
| | Red lesions | Seborrheic dermatitis (NI) | 0.17 | | |
| | | Contact eczema (NI) | 0.08 | | |
| | | Lichen planus | 0.08 | | |
| | Pigmented lesions | Lentigo | 1.02 | | |
| | | Nevus | 0.25 | | |
| | | VIN3 | †0.04 | | |
| | Ulcers (aphthous or Behçet's disease) | | 0.04 | | |
| | Tumors | Benign | 2.08 | | |
| | | Malignant carcinoma Stage II | ‡0.04 | | |
| Total | | | 100 | 100 | 2,352 |

NI = nonspecific inflammation; HPV = human papillomavirus; VIN = vulvar intraepithelial neoplasia.
*HPV-VIN1 = 5.8%.
†VIN2, VIN3, vulvar carcinoma stage IA = 0.33%.
‡Vulvar carcinoma stage II = 0.04%.

in the vestibule and on the inner half of the labia minora but is weak on the outer half (Figs. 1A, B).

C. *Wavy mucosa.* The mucosa of the inner surface of the labia minora and the vestibule appears wavy. When it is stretched, all the waves disappear, differing from cobbled mucosa. The Lugol test results are similar to those of smooth mucosa.

D. *Papillary hyperplasia.* This presents as soft, finger-shaped protrusions of different lengths (papillae), located in the introitus and inner surface of the labia minora. Lugol staining of the papillae is positive when they are located in the vestibular area and internal half of the inner surface of the labia minora and is weak on the outer half.

E. *Atrophied skin and mucosa.* The mucosa appears smooth and turns paler or whitish with acetic acid application. On the skin, significant pigmentation changes are seen (dyschromia).

II. Findings indicating an infectious, nonviral pathology

A. *Raised acetowhite skin patches.* These appear 1 or 2 minutes after acetic acid is applied. Multiple round, clearly defined, smooth patches are observed, sometimes with tiny punctation, mainly on the external surface of the labia majora and the area of the perineum.

The suspected diagnosis is *Candida* infection, as *Candida* species are found in 95% of vaginal exudate specimens. No fungi are present in the patches. Histopathological study reveals hyperplasia, acanthosis, and hyperkeratosis (Fig. 1C).

B. *Smooth acetowhite mucosa.* The application of acetic acid reveals whitish areas on the inner surface of the labia minora. The margins of these areas may be clearly defined, symmetrical, or asymmetrical. They present in patches or dispersed over all the mucosa. The Lugol test is negative on the acetowhite areas. The suspected diagnosis is *Gardnerella vaginalis* or *Candida* infection; these organisms can be found in the vaginal exudate. Histology frequently reveals hyperplasia and, occasionally, signs of viral lesions (Fig. 1D).

C. *Raised yellow-white punctation on the skin.* The findings appear with or without acetic acid application, as a discrete, yellow-white graininess on the outer surface of the labia majora. The suspected diagnosis is staphylococcal infection of the sebaceous glands.

D. *Red lesions*

1. *Candida* infection might be heralded by diffuse erythematous lesions with fine squamous flaking of the skin and vulvar semimucosa, accompanied by white "cotton-ball" secretions.
2. The epidermal mycoses known as *Hebra's dermatophytoses* present as flat, red, single lesions covering the vulva, genitocrural fold, and inner thigh areas. The lesions have a clearly marked outer margin.
3. *Tinea versicolor* is to be suspected in the presence of multiple, faint, red, circumscribed lesions having clearly defined edges located anywhere in the vulvar area, as well as on the thorax and in the interscapular zone.
4. *Erythrasma* (produced by *Corynebacterium minutissimum*) is the likely diagnosis in the face of flat red lesions located only in the fold areas.
5. *Secondary syphilis* is the suspected diagnosis if rounded, clearly defined but sometimes eroded, moist, red or pink papular lesions are located on the outer surface of the vulva, perineum, and anus.
6. *Erysipelas* (caused by hemolytic B type group A streptococci) presents as a patchy bright-red lesion in the perivulvar area. The lesion bears an elevated edge that, as the process evolves, becomes covered with vesicles and ulcers.

E. *Red and white lesions.* These are patchy or diffuse white lesions alternating with red areas, in conjunction with a whitish exudate and excoriations (pruritus) located on skin and mucosa. With acetic acid application, the red lesions of the mucosa become whitish. The suspected diagnosis is infection by *Candida* species. Treatment and repeat vulvoscopy are mandatory.

F. *Fissures.* These are linear lesions that alter the integrity of the epithelium and usually are located in the vulvar introitus and interlabial sulcus, sometimes being visible with acetic acid and presenting with acetowhite edges. In this instance also, the suspected diagnosis is infection by *Candida* species.

G. *Erosions.* An erosion is a single, painless, hard-based, superficial ulceration located in the mucosa-skin region, resting on the edematous zone, and accompanied by hard, painless, inguinal micropolyadenopathy. Primary syphilis is the likely diagnosis.

H. *Ulcers*

1. A *soft chancre* caused by Ducreyi bacillus presents as a single, acute, rounded, noninfiltrated ulcer with a granular base and detached edges.
2. A single ulcer with a grayish base implies *tuberculosis.*
3. *Lymphogranuloma venereum* (Nicolas and Favre disease) is heralded by ulcers and fistulas accompanied by an intense edema and multiple adenopathies.
4. A single chronic ulcer, secondary to a tumor, points to a diagnosis of *tertiary syphilis.*
5. *Granuloma inguinale* (donovanosis) presents as a painless, clean-surfaced ulcer with everted edges on a vegetating lesion.

I. *Tumors*

1. Small painful tumors located on the external surface of the labia majora should cause one to suspect *infection of the sweat or sebaceous glands*, with obstructed outlets.

2. A bulging of the lower third of the inner surface of the labia majora, accompanied by reddening and pain, generally points to a diagnosis of *bartholinitis* (pseudoabscess or true abscess of Bartholin's gland or its outlet).

J. *Others*

III. Findings indicating an undefined infectious pathology

In this group are images that may be caused by multiple vaginal microbial agents or by vulvar HPV. The inflammatory reactions produced thereby appear to be similar, although they may be diagnosed as different entities. In these cases, the first step is to treat the identified vaginal microbial agent and then, if the image persists, to proceed to a vulvar biopsy.

A. *Cobbled mucosa.* Raised, rounded formations with or without blood vessels in the introitus and inner surface of the labia minora compose this finding. The Lugol test is negative at the apex of such formations. The suspected diagnosis is vaginal infection by *Gardnerella vaginalis* (in our sample, 38% of the cases), *Candida* species (40%), or HPV in vulvar epithelium (22%) (Fig. 1E).

B. *White punctation on a pink background.* Multiple small white spots appear on the mucosa after application of acetic acid and are located diffusely on the inner surface of the labia minora (Fig. 1F). When Lugol solution is applied, the spots are iodine-negative (Fig. 2A). Vaginal infection by *Candida* species is likely (90% probability), though vulvar infection by HPV is another possibility (10% probability).

C. *Red punctation on a pink background.* Multiple small red spots appear on the mucosa after the application of acetic acid. They are located diffusely on the introitus and the inner surface of the labia minora. These spots are iodine-negative (Fig. 2B). Vaginal infection by *Candida* species (40%), *Trichomonas vaginalis* (28%), *Gardnerella vaginalis* (16%), and HPV in the vulvar epithelium (16%) are the diagnoses that should be suspected.

IV. Findings indicating viral pathology

A. *Raised acetowhite mucosa.* These raised patches, which appear white after application of acetic acid, are found preferentially on the internal segment of the inner surface of the labia minora. They may be circumscribed or extend diffusely on the mucosa and are iodine-negative. HPV-VIN1 is the likeliest diagnosis.

B. *Flowering papillary hyperplasia.* Numerous, soft, finger-shaped protrusions of various lengths (papillae) are located in the introitus and the inner surface of the labia minora (Fig. 2C). The apexes of the papillae are iodine-negative or irregular, which distinguishes this finding from the papillae in physiological papillary hyperplasia (Fig. 2D). A viral HPV-induced process is probable.

C. *Exophytic lesions*

1. *Spiked condylomata* appear as spiked patches that turn white after application of acetic acid. The patches are located preferentially on the inner surface of the labia minora and introitus. They may be single or multiple and are iodine-negative.
2. *Condylomata acuminata* are harder whitish excrescences that sometimes are vascularized. They are made more visible with the application of acetic acid and affect mainly the introitus, perineum, and labia majora.
3. *Papillary condylomata* are pink, soft, bunchlike papillary excrescences that are made more visible with acetic acid. They are preferentially located on the mucosa.
4. A *giant condyloma* is a large, usually single tumor located in any part of the vulva. Occasionally, it is pearl-white and its surface is uneven.

D. *Spikes.* These minute, well-dispersed formations alternating with normal mucosa turn whitish on application of acetic acid and are seen preferentially on the vulvovaginal introitus. They may be distinguished from papillary hypertrophy by Lugol solution application, as the latter is iodine-positive and these spikes are iodine-negative. A diagnosis of HPV-induced infection should be suspected.

E. *Vesicles and ulcers*

1. *Herpes simplex infection* may manifest as vesicles grouped on an edematous and erythematous background, filled with a transparent liquid that becomes cloudy as the pathological process evolves (24–48 hours).
2. *Herpes simplex infection* also may manifest as multiple, clean-edged ulcers, ac-

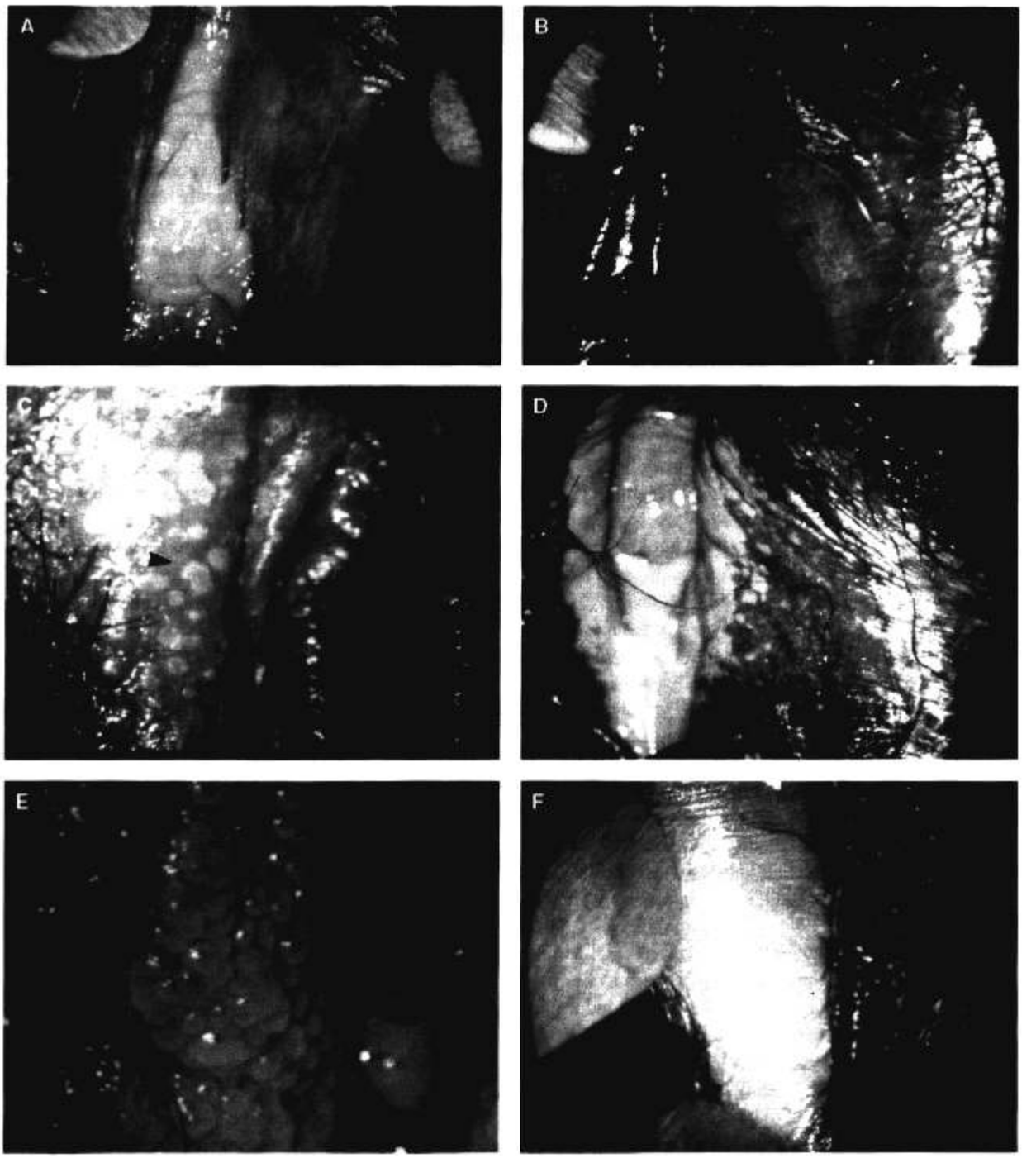


**Figure 1.** (*A*)Group I.B, smooth mucosa. (*B*) Group I.B, smooth mucosa. Lugol-positive in the vestibular area and the inner half of the labia minora. (*C*) Group II.A, raised acetowhite patches on the skin. Infection by *Candida* species in vaginal exudate. (*D*) Group II.B, smooth acetowhite mucosa. (*E*) Group III.A, cobbled mucosa. (*F*) Group III.B, white punctation on a pink background.

companied by a burning sensation, sometimes taking the form of fissures. Such ulcers are located in mucosal and skin areas.

F. *Small umbilicated tumor.* This is a (single or multiple) rounded new growth, sometimes containing water. It appears in relief on the surface of the labia majora and sometimes in surrounding areas also. The suspected diagnosis is molluscum contagiosum (poxvirus).

G. *Others*

V. Findings indicating a noninfectious pathology

A. *White lesions.* White findings seen without application of acetic acid may be caused by diverse pathological processes.

1. The lesions of *VIN* are circumscribed and white and are located preferentially on the mucosa of the posterior two-thirds of the vulva or on hairy areas. They are dense white and slightly elevated.
2. *Squamous cell hyperplasia* or *VIN* might present as extensively diffuse lesions having dense white, thickened epithelium.
3. *Lichen sclerosus* is heralded by irregularly and extensively diffuse white lesions located on skin and mucosa. Sometimes these are accompanied by edema, lichenlike papillae, and thinning epithelium.
4. *Lichen planus* can present as circumscribed white lesions in the form of patches or reticules on skin or mucosal areas.

B. *Punctation—mosaic.* A white vascularized finding on the mucosa might indicate the presence of VIN.

C. *Red lesions*

1. *Seborrheic dermatosis* may appear as a finely squamous, generally diffuse, bilateral eczematous erythema on the outer surface of the labia majora.
2. *Contact eczema* (allergic or irritant reaction) can be recognized as red, flat, diffuse lesions presenting on the external surface of the labia majora, sometimes with the addition of vesicles and spreading to the inguinocrural folds.
3. *Psoriasis* presents as red, flaky, papular patches coinciding with whitish background changes that usually affect the hairy zone.
4. *Lichen planus* is an erythematous, occasionally erosive patch located in the vestibule. It sometimes is accompanied by violet or pigmented papillae and coexists with lesions in other skin or mucosal areas (mouth, thorax, limbs).
5. *VIN* exhibits red or pink patches or papillae especially in mucosal areas.

D. *Complex lesions* (red and white). Red and white lesions found in a diffuse eczematous patch mainly affecting the skin area should cause one to suspect Paget's disease.

E. *Pigmented lesions.* Pigmentation is enhanced during pregnancy and varies with age. A more intensely pigmented area can be seen in an episiotomy scar.

1. *Lentigo* is a single patch or multiple light- to medium-brown flat patches on mucosa or skin.
2. A *nevus* is a single, isolated, slightly prominent lesion located on skin or mucosa.
3. *Melanomas* are circumscribed or diffuse, raised, blackish to dark brown lesions, preferentially located around the vulvar fourchette.
4. *VIN* displays single or multiple patches with keratinized warty or papular excrescences located in any sector of the vulva.
5. *Benign or malignant acanthosis nigricans* usually presents as a finely warty surface pigmentation predominating on the major folds and the pubis.
6. *Systemic pathologies* such as Addison's disease, pheochromocytoma, and Cushing's syndrome might be heralded by diffuse, flat pigmentation, mainly on skin.
7. *Postinflammatory lesions* are circumscribed or diffuse, appear subsequent to inflammatory processes, and usually show up clearly owing to scratching.

F. *Depigmented lesions*

1. *Vitiligo* is likely in the presence of vulvar and extragenital depigmented, sometimes multiple patches.
2. *Albinism* should be considered if vulvar and extragenital depigmented patches include hair elements.
3. *Postinflammatory lesions* appear circumscribed or diffuse.

G. *Blisters.* Chronic blistering disease (pemphigus) or acute blistering (polymorphous erythema, toxicoderma) is likely in the presence of vulvar and extragenital lesions containing liquid.

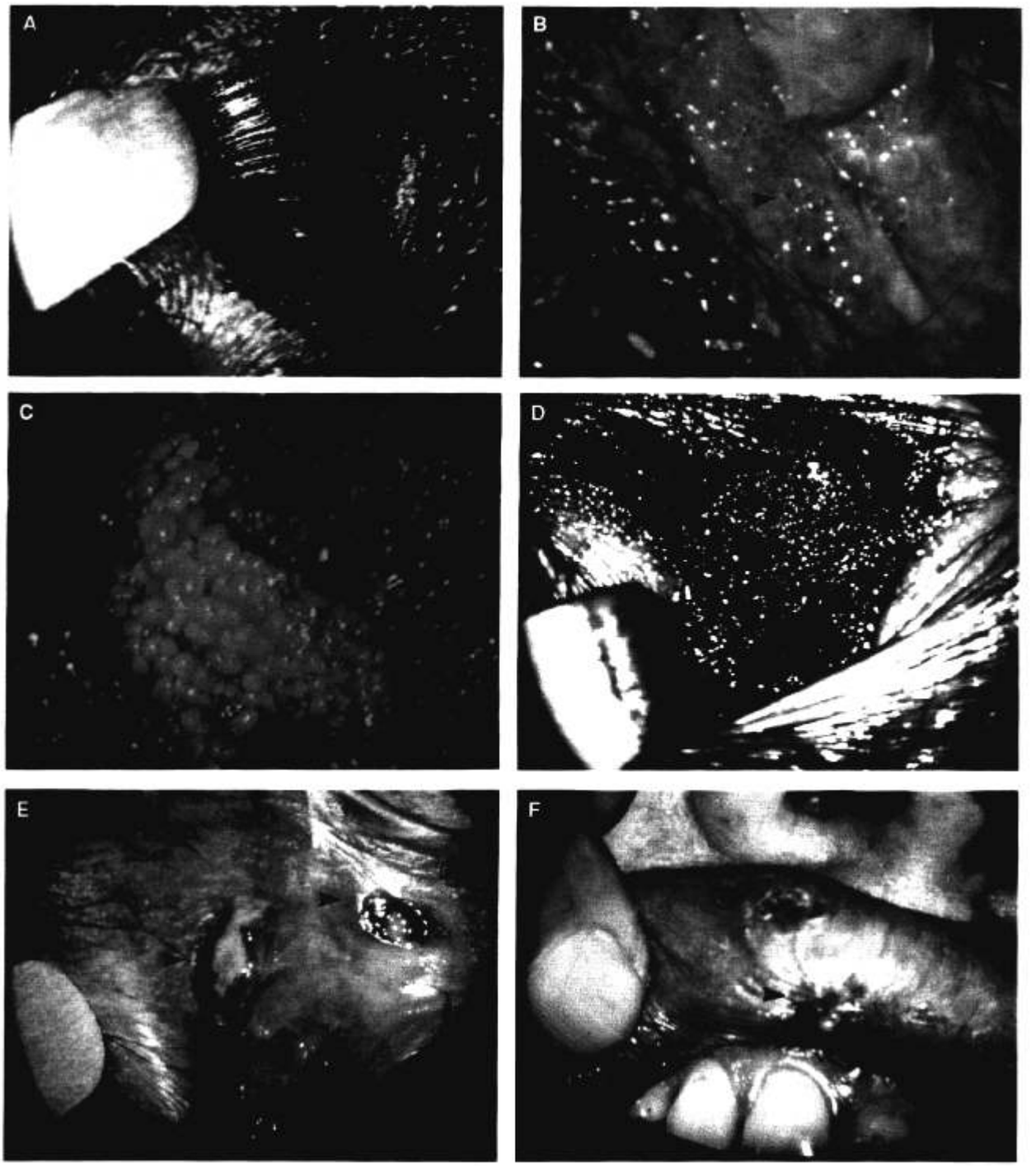


**Figure 2.** (*A*) Group III.B, white punctation spots that are iodine-negative. (*B*) Group III.C, red punctation on a pink background. (*C*) Group IV.B, flowering papillary hyperplasia. (*D*) Group IV.B, flowering papillary hyperplasia. The apexes of the papillae are iodine-negative. (*E*) Group V.H.1, ulcers in vulva. Behçet's disease, or aphthous complex. (*F*) Group V.H.1, ulcers in mouth. Behçet's disease, or aphthous complex.

**Table 3. Vulvoscopic Finding Frequency Related to Pruritus. History of Cervical Lesions and Perceptible Vulvar Lesions**

| Group | Findings | Histopathology | Category (%) A | | B | | C | | D | | E |
|---|---|---|---|---|---|---|---|---|---|---|---|
| I | Normal | Normal | 76.50 | | 38.5 | | 76.3 | | 40 | | — |
| II | Raised acetowhite patches | | 8.58 | | 27.45 | | 1.32 | | 18.46 | | — |
| | Smooth acetowhite mucosa | | 2.45 | | 5.54 | | 0.66 | | — | | — |
| | Raised yellow or white spotting | NI | 0.52 | | 1.26 | | 1.32 | | 3.08 | | — |
| | Red lesion | | 13.8 0.35 | 43.1 | 1.01 | 4.6 | 0.66 | 30.8 | — | | — |
| | Fissures | | 1.31 | | 7.56 | | — | | 9.23 | | — |
| | Erosions | | — | | 0.25 | | 0.66 | | — | | — |
| | Tumors | | 0.61 | | — | | — | | — | | — |
| III | Cobbled mucosa | NI | 0.76 | | 2.52 | | 2.63 | | 3.08 | | — |
| | | HPV-VIN1 | — | | *0.74 | | *2.63 | | — | | — |
| | White spotting | NI | 0.52 | | 0.50 | | — | | — | | — |
| | | HPV-VIN1 | 3.2 — | 7.1 | *0.13 | 6.6 | — | 9.2 | — | | — |
| | Red spotting | NI | 1.93 | | 2.40 | | 1.32 | | 3.08 | | — |
| | | HPV-VIN1 | — | | *0.81 | | — | | *3.08 | | — |
| IV | Raised acetowhite mucosa | HPV-VIN1 | *0.35 | | *0.25 | | *2.62 | | *3.08 | | — |
| | Flowering papillary hyperplasia | HPV | — | | *1.10 | | *1.32 | | — | | — |
| | Exophytic lesions | HPV | *1.55 | | *1.50 | | *5.26 | | — | | *46.8 |
| | Spikes | HPV | 2.8 *0.35 | 5.3 | — | 10.5 | *1.32 | 12.3 | *3.08 | 59.6 | — |
| | Vesicles and ulcers | HSV (lab.) | 0.52 | | 2.5 | | — | | 6.14 | | 12.8 |
| | | Lichen sclerosus | — | | 1.13 | | 0.66 | | — | | — |
| | | Squamous cell hyperplasia | — | | 0.50 | | — | | — | | — |
| V | White lesions | VIN1 | *0.08 | | *0.25 | | — | | — | | — |
| | ↓ | VIN2 | †0.08 | | — | | — | | — | | — |
| | | VIN3 | — | | †0.25 | | — | | †3.08 | | — |
| | | Lichen planus | — | | 0.13 | | — | | — | | — |
| | Mosaic | VIN1 | — | | — | | *0.66 | | *3.08 | | — |
| | Punctation | VIN3 | — | | †0.12 | | — | | — | | — |
| | Punctation | CaSI | — | | †0.13 | | — | | — | | — |
| | Red lesions | Seborrheic dermatitis (NI) | 0.17 | | 0.25 | | — | | — | | — |
| | | Contact eczema (NI) | 3.7 — | 6.0 | 0.25 | 2.0 | — | 1.7 | — | 40.4 | — |
| | | Lichen planus | — | | 0.25 | | — | | — | | — |
| | Pigmented lesions | Lentigo | 1.40 | | 0.76 | | 0.66 | | — | | — |
| | | Nevus | 0.35 | | — | | — | | — | | 4.2 |
| | | VIN3 | — | | — | | — | | †1.53 | | — |
| | Ulcers (aphthous or Behcet's disease) | | — | | — | | — | | — | | 2.1 |
| | Tumors | Benign | 1.62 | | 2.01 | | — | | — | | 32.0 |
| | | Malignant | — | | — | | — | | — | | ‡2.1 |
| | Total percentage | | 100 | | 100 | | 100 | | 100 | | 100 |
| | Total number | | 1.142 | | 794 | | 304 | | 65 | | 47 |

NI = nonspecific inflammation; VIN = vulvar intraepithelial neoplasia; HPV = human papillomavirus.
*HPV-VIN1 = 2.33% (A), 4.78% (B), 13.81% (C), 12.31% (D), and 46.8% (E).
†VIN2, VIN3, vulvar carcinoma stage I (CaSI) = 0.08% (A), 0.50% (B), and 4.60% (D).
‡Vulvar carcinoma stage II = 2.1% (E). For category D, see preceding footnote.

H. *Ulcers*

1. A diagnosis of *Behçet's disease*, or *aphthous complex*, should be suspected in the face of deep, painful lesions that appear simultaneously in the vulva (Fig. 2E), mouth (Fig. 2F) and, sometimes, eyes.
2. *Crohn's disease* may manifest as generally linear lesions involving a loss of tissue and having a clean base. The lesions are located in the perivulvar and perineal areas.
3. *Endophytic carcinoma* might be heralded by indurated, painless, bleeding lesions bearing infiltrated margins and a broken-up base. Loss of tissue is involved.

I. *Tumors.* These are globular and bulky formations of variable size and appearance. Generally, a smooth surface indicates nonviral origin. In contrast, a highly vascularized, indurated surface that bleeds at the slightest touch suggests carcinoma, adenocarcinoma, or sarcoma. The size and location of the lesions also are valuable for identification.

1. *Large formations* might be a Bartholin's gland cyst, epidermal cyst, serous cyst, fibroma, lipoma, myoma, or neurofibroma

or the corresponding malignant degeneration of any of these.

2. *Small formations on the labia majora* likely indicate an epidermal cyst, serous cyst, steatocystoma, syringoma, Fox Fordyce's disease, angiomatic tumor, lipoma, fibroma, papilloma, hidradenoma, or aberrant mammary gland or the corresponding malignant degeneration of any of these.
3. *Small formations on the labia minora or interlabial sulcus* should cause one to suspect a hidradenoma or endometrioma or the corresponding malignant degeneration of either of these.
4. *Small formations on the vestibular and vaginal annulus* might indicate mucous cysts, mesonephric remains cysts, or the corresponding malignant degeneration of either of these.
5. *Formation of any size and location, vascularized and indurated, in the epithelium of the skin and mucosa* is indicative of carcinoma.

J. *Others*

### Data Analysis

To evaluate the correlation between the vulvoscopy findings and the parameters mentioned earlier (pruritus, HCL, PVL), we calculated the relative frequency of findings per category, as shown in Table 3, and compared the percentages of VIN among the categories, as shown in Table 4.

The frequency distribution of the findings per group obtained in a routine vulvoscopy (Table 2) could differ from that found in a selective vulvoscopy by virtue of symptoms or medical case history. This difference is indicated by the variations between Tables 2 and 3.

The finding of acetowhite skin patches (IIA) may be considered pathognomonic. Whereas 95% of patients with these findings demonstrate, on direct examination of the vaginal exudate, an infection by *Candida* species, patch culture is negative for fungi, and the histological examination reveals hyperplasia or acanthosis. Determining whether these findings are attributable to an allergic reaction to metabolites produced by the infecting agent might be worthwhile. In these Group IIA cases, because antimycotic treatment, when generally applied, eliminates vaginal *Candida* infection and vulvar patches, vulvoscopic examination allows acceleration of the administration of treatment and precludes the need for laboratory studies.

We consider cobbled mucosa (III.A), white punctation (III.B), and red punctation (III.C) to be findings that indicate an undefined infectious process. This denomination is used because any of these findings can correspond to a nonspecific inflammation due to an infection caused by bacteria, fungi, or parasites concomitant with a vaginal process or, less often, with a vulvar HPV infection (Table 2). In these Group III cases, the first line of defense is specific vaginal antimicrobial treatment. In the event that the lesion remains, a vulvar biopsy is suggested.

The findings in group III are insufficient for diagnosing HPV; the symptoms (pruritus) or a history of cervical lesions are better indications. This conclusion emerges from the finding that the category-type evaluation did not reveal a significant association with HPV in category A (asymptomatic without history), whereas when pruritus or a history of cervical lesions was present (categories B, C, and D), a significant association did occur ($p < .01$).

As shown in Table 3, we found that 2.33% of the lesions in category A corresponded to HPV and VIN1 (1.55% of the HPV lesions were exophytic); 0.52% corresponded to herpes; and 0.08% corresponded to VIN2. These are important findings, because they correspond to asymptomatic women without a history of cervical lesions. A diagnosis of exophytic condyloma or herpesvirus infection will allow the physician to adopt management approaches to prevent sexual transmission. A diagnosis of herpes during pregnancy will allow the physician to adopt strict control measures and special precautions during delivery.

A history of cervical lesions is more relevant than the presence of pruritus in the diagnosis of HPV–VIN1 (Table 3). Either of these findings appear in 4.78% of category B patients (presence of pruritus) and in 13.81% of category C patients (history of cervical lesions), resulting in a probability value of less than .000001. Likewise, no significant difference is noted ($p > .75$) be-

**Table 4. Relative Frequency of Vulvar Lesions According to Pruritus and a History of Cervical Lesions**

| Lesion | Categories (%) | | *p* Value |
|---|---|---|---|
| HPV and/or VIN1 | B: 4.78 | C: 13.81 | $p < .000001$ |
| | D: 12.31 | C: 13.81 | $p > .75$ |
| VIN3 and/or Ca.SIA | B: 0.5 | C: — | $p > .5$ |
| | C: — | D: 4.6 | $p < .003$ |
| | B: 0.5 | D: 4.6 | $p < .004$ |

Ca.SIA = vulvar carcinoma stage IA.

tween category D patients (with pruritus and a history of cervical lesions), in which the referred lesions represented 12.31%, and category C patients (with a history but without pruritus).

For the diagnosis of more severe vulvar lesions, the joint presence of pruritus and cervical lesions has more diagnostic value than does the appearance of either finding alone (Table 4). This is substantiated by the distribution of VIN3 and minimally invasive carcinoma: 0.5% in category B (pruritus), no case in category C (only a history), and 4.6% in category D (pruritus and a history). A comparison of categories B and C does not show a significant difference ($p > .5$), whereas both categories are clearly distinguished from category D: B/D, $p < .004$, and C/D, $p < .003$. Moreover, we must bear in mind that in category C, 80% of the cervical lesions were CIN1, whereas in category D, 90% were CIN2 or CIN3 or carcinoma.

The pruritus in patients with VIN3 and, in most cases, with invasive vulvar carcinoma was sporadic and was not always the reason for the consultation. Pruritus spanned a 2-month to 2-year development period, suggesting that the lesions could have been present before the symptom was noted. A patient with a 1 × 1–cm invasive vulvar carcinoma had been medicated for symptoms for a long time. This sporadic mode of pruritus should be a warning sign for physicians and a significant factor in the decision to carry out a selective vulvoscopy. Regardless of symptoms and history, when the vulvar lesion is perceptible to the patient, vulvoscopy produces findings from groups IV and V. Table 3 shows that in category E, 59.6% of cases involve viral pathological processes (group IV) and 40.4% involve noninfectious processes (group V). Among the latter, 32% correspond to benign tumors and 2.1% to malignant lesions.

### Determining When a Biopsy Is Necessary

Performing a biopsy is vital if findings of groups IV or V are present, with the exception of the cases detailed later, in which the vulvoscopic findings can guide treatment and histological studies are unnecessary as a first step. In the following cases, biopsy is necessary only when the lesion persists after a therapeutic trial tailored to the suspected diagnosis: findings of groups III; IV.E; V.C.1, 2, and 3; and V.H.1 and 2. Biopsy also does not appear to be necessary in the presence of findings of groups I; II; V.E.1, 6, and 7; and V.F and G.

## CONCLUSIONS

Our classification enables us to state that, using a routine vulvoscopic examination, we can diagnose asymptomatic lesions and contribute to the prevention of sexual transmission of some processes such as herpesvirus and viral condyloma. The detection of asymptomatic herpesvirus during pregnancy will help us in managing deliveries.

Routine vulvoscopy also may help us to detect asymptomatic lesions other than VIN such as nevus (V.E.2), the early diagnosis and removal of which are important owing to their association with melanoma. Likewise, it can speed the therapeutic process and avoid more complex studies (mycology, bacteriology, or histology) in cases of nonviral infection.

In addition, our description and grouping of the findings might permit the physician to readily discard from consideration such pathological processes as HPV-induced flowering papillary hyperplasia (IV.B), by distinguishing it from physiological hyperplasia (I.D). Likewise, suitable training in vulvoscopy will enable one to suspect and diagnose relatively common pigmented lesions such as benign lentigo (V.E.1), differentiating them from rare, severe, and generally asymptomatic lesions such as melanoma (V.E.3).

Finally, aware of the undeniable need for pathological anatomy and biopsy studies for certain diagnoses, we are convinced that a classification of vulvoscopic findings such as that proposed in this article, if used in routine practice, could invigorate and enrich the task carried out by lower genital tract specialists, benefiting the computerized compilation of data and facilitating subsequent exchange of information.

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