Microcolposcopy vs colposcopy in evaluating abnormal Pap smear

Comparison with histological findings

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Summary: Microcolposcopy is a microscopic examination which permits the observation of in vivo normal and dysplastic cells.

A comparison was made between colposcopy and microcolposcopy in terms of sensitivity, specificity and predictive value in the diagnosis of cervical intraepithelial neoplasia. Seventy-eight patients with abnormal cervical smears were submitted to colposcopy, microcolposcopy and one or more biopsies on the microcolposcopically suspected areas. Currents classifications were used for the colposcopy and microcolposcopy. A comparison was made between the colposcopic description of abnormal transformation zone, and the microcolposcopic grade 2. The findings suggests that microcolposcopy is more sensitive and has more diagnostic accuracy than colposcopy in the diagnosis of cervical intraepithelial neoplasia. Microcolposcopy is a good alternative to colposcopy in evaluating abnormal cervical cytology.

Key words: Microcolposcopy; Colposcopy; Histology; Cervical intraepithelial neoplasia.

INTRODUCTION

The widespread use of Papanicolaou smears (Pap-test) and of colposcopy as screening methods has over the years brought about a considerable drop in the rate of onset of invasive carcinoma of the cervix, contributing greatly to the early diagnosis of these neoplastic forms ([1, 2, 3]). In the last few years, on the other hand, an increase in viral infections, associated or not with cervical intraepithelial neoplasia (CIN), has been observed oin young patients. Despite considerable improvements in its optical system, colposcopy continues to exhibit some limitations. In fact, since with is a macroscopie examination, a colposcopy-based diagnosis does not allow a completely conclusive differentiation between benign and malignant lesions ([4]). In a recent report, Nuovo *et al.* show that a significant 46% of aceto-white lesions detected with colposcopy were not found to be CIN during a subsequent histological examination. Syrjanen *et al.* have obtained fully normal colposcopic findings in 7.1% of patients with class III Papanicolaou smear ([5]). Further in 50 to 70% of postmeno-

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Clin. Exp. Obst. Gyn. - ISSN: 0390-6663
XX, n. 4, 1993

Table. 1. — *Colposcopic and microcolposcopic grading compared with histology on 78 patients.*

Colposcopy			Microcolposcopy			Histology		
Unsat	NTZ	AnTZ	G0	G1	G2	CIN	CIN+HPV	Normal
(5)			(1)	(1)	(3)	(2)	(1)	(2)
	(12)	(61)	(3)	(3)	(67)	(22)	(46)	(5)

NTZ = Normal transformation zone; AnTZ = Abnormal transformation zone; G = Grading; CIN = Cervical intraepithelial neoplasia; HPV = Human papillomavirus.

pausal women colposcopy does not provide a complete visual observation of the squamocolumnar junction, because of its ascent into the cervical canal ([6]).

Microcolposcopy, developed by Hamou, is a microscopic examination which permits after vital staining and magnification from 1.1 to 1.150, to observe in vivo the transformation zone, the squamocolumnar junction and the endocervical canal with normal or dysplastic cells ([7, 8]). The aim of this study was to compare colposcopy and microcolposcopy in terms of sensitivity, specificity and predictive value, in the diagnosis of CIN as ascertained subsequently by histology performed by endocervical curettage and cervical biopsies (where bioptic samples used for histology were taken under microcolposcopic guidance).

MATERIAL AND METHODS

Of all the patients who came to our outpatients department, from January 1989 to December 1991 seventy-eight were selected for the study because each had an abnormal Pap-test (CIN+HPV or CIN-positive). The ages of the patients ranged from 18-64 years. Immediately after the results of the Pap-test, each patient underwent a standard colposcopic examination with a physician who was not aware of the results of their prior Pap-test. Three days later, each patient was subjected to a microcolposcopic examination as well, by a different physician who did not known any of the previous findings (Pap-tests or standard colposcopy). It should be noted that, in order to avoid having the patients influence the examining physicians, the patients were informed of the Pap-test results only after their microcolposcopy.

The microcolposcopic examination was performed with the Hamou microcolpohysteroscope; a 2% Lugol solution and Waterman's blue ink were used for the vital staining. During the microcolposcopies all patients had an endocervical curettage with a Novaks cannula and the microcolposcopically suspected areas were subjected to one or more biopsies performed with an Alexander's forceps. Each sample was taken (from areas that appeared hypercellular in the visual examination) after lightly pressing the microcolposcope on the suspected spot, in order to create a small fovea where the sampling was then made. The histological samples were examined by a third physician. Italian ([9]) and Hamou ([10]) classification were used for each colposcopy and microcolposcopy, respectively. The final diagnosis was based on the histological findings. In our study five of 78 patients were excluded from the comparison because the colposcopy was revealed to be insufficient (no visualization of the squamocolumnar junction). A double comparison was made between the colposcopic abnormal transformation zone grade 1 and grade 2, the microcolposcopic grade 2 and the histological results. Finally the sensitivity, the specificity, and the positive and negative predictive values of the colposcopy and microcolposcopy in the diagnosis of CIN, in the context of this study, were assessed.

RESULTS

In our study (tab. 1) microcolposcopy revealed CINs in 67 out of 73 patients. Six patients had no CIN on microcolposcopic assignment. The histology performed after microcolposcopy demonstrated a sensitivity of 98.5% and a specificity of 100%, while the positive and negative predictive value were 100% and 83% respectively. The diagnostic accuracy was 98.6%. Colposcopy revealed the presence of an abnormal transformation zone

grade 1 and grade 2 in 61 out of 73 patients. 12 patients had normal colposcopic findings. Regarding the cases excluded and in which colposcopy was inadequate microcolposcopy showed three endocervical CINs confirmed by histology.

The colposcopy, considering all of the abnormal transformation cases, demonstrated a sensitivity of 89.7%. The specificity was 100% while the positive and negative values were 100% and 41% respectively. The diagnostic accuracy was 90.4%. The diagnostic accuracy or misclassification error was 1.36 for microcolposcopy and 9.58 for colposcopy.

In seven cases the cytology was positive and the histology negative. It is worthwhile noting that 51 patients of the studied case presented a combination of CIN with human Papilloma Virus infection; specifically, in 35 of the CIN 1 cases, in 12 of the CIN 2 and in 4 of the CIN 3.

CONCLUSION

With the advent of microcolposcopy, new horizons have been opened in the study of cervical pathology. Microcolposcopy enables the transformation zone and the squamocolumnar junction (the most frequent area for initial neoplastic transformation zone and the squamocolumnar junction (the most frequent area for initial neoplastic transformation) to be identified and studied. The transformation zone has been described by Hamou as an optic window through which it is possible to observe the entire thickness of the epithelium with its cellular layers simply by rotating the lens by 360° with an × 60 enlargements. In the cases in which areas of atypical cells are identified, a greater enlargement (× 150) enables a finer assessment of the nucleocytoplasmatic features. Thus in expert hands, this method permits an in vivo cytological diagnosis with a precise determination of the location and extension of the suspected areas, thus enabling the creation of an accurate map of the evidenced lesions.

Moreover, unlike colposcopy (which can only shows macroscopic esocervical lesions) microcolposcopy enables the cervical canal to be visualized and thus endocervical lesions to be pinpointed and studied.

Finally, this technique allows the measurement, with a good deal of accuracy, of the distance between the apex of the lesions and the external uterine orifice, a useful parameter for a successful surgical excision ([11]). As a result of this method, modern techniques of resection and laser therapy can be implemented with a precision and accuracy never before achieved ([12]).

In our study, microcolposcopy was demonstrated to be more sensitive than colposcopy in the diagnosis of CIN (98.5% vs 89.7%), unlike the experience of Tseng et al. who obtained a higher sensitivity with colposcopy than with microcolposcopy ([13]). Vancaille *et al.* using microcolposcopy have obtained a positive correlation of 88.5% ([14]). Both methods demonstrated the same specificity, being this adequate for identifying healthy patients.

Microcolposcopy provided improved diagnostic accuracy (98.6%). Our study leads us to conclude that microcolposcopy seems to offer greater precision concerning decisions and diagnosis; this was also confirmed by the determination of the negative predictive value which improved with this method, as compared to the colposcopic technique (83% vs 41%). This figure is more reliable fro the clinician who must decide whether a patient showing a negative test is affected or not by disease, thus diminishing the risk of making classification mistakes. We believe that, despite its popularity, colposcopy cannot be considered a suitable screening method, because of its lower sensitivity; we would also like to re-emphasize that

colposcopy does not always allow the visualization of the squamocolumnar junction, specially in women in menopause or previously subject of treatment of the cervix. In five cases colposcopy was not able to investigate the squamocolumnar junction and, in three of these cases, microcolposcopy was able to demonstrate the presence of CIN (confirmed later by histology).

At this point, we believe it to be appropriate and also necessary to elaborate somewhat on the diagnostic effectiveness of cytology and histology. Hartman reported 29% of false negativity in the smears of patients suffering from CIN 3 ([15]). Morrel, in a review of the applicable literature, reports a rate of false cytological negative ranging from 28 to 50% for CIN 1-2 and from 19 to 33% for CIN 3 ([16]). According to Walker, a third of normal smears are really CIN ([17]). The errors can be caused by many factors: the spatula or cotton used can in certain cases retain dysplastic cells, or these cells could be covered by a hyperkeratosis, or the smears could have been token in an inadequate manner ([18]). Conversely, in the cases in which the histology ([19, 20]) gives negative responses after positive cystological findings, it is appropriate to note that in very circumscribed lesions the bioptic sampling must be accurately aimed, otherwise an initial lesion can easily be missed. In fact, it has already been demonstrated that the histology can be negative in cases of inframillimetric neoplastic lesions. The histological examination on the biopsy only permits a very detailed observation of the piece removed and it cannot provide information on the rest of the cervix. Moreover, different degrees of CIN can coexist in a more or less extended area, so that a biopsy carried out in one section of the area instead of another can possibly underestimate or even ignore an invasive cancer. With the advent of microcolposcopy this margin of error has been greatly reduced, since the biopsies are performed only on well-identified suspected areas.

Microcolposcopy proved to be a very accurate and reliable technique for the detection of the site of CIN. Its high concordance with histology, the low percentage of misclassification, the absence of contraindication, the speed and easy repeatibility, as well as low cost, are all remarkable advantages which suggest microcolposcopy as a technique of choice for identification of CIN in pathological smears. Furthermore the possibility of using a photographic device on the suspected images could provide an additional aid to the cytologist in confirming or denying a diagnosis in doubtful cases.

CONDENSATION

Microcolposcopy has been demonstrated to be more sensitive and to have more diagnostic accuracy than colposcopy in the diagnosis of cervical intraepithelial neoplasia.

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