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# Misconceptions about routine colposcopy

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**Summary**

Colposcopy is practised in two ways: 1) to assess women with abnormal screening findings and/or clinically suspicious cervix (called referral colposcopy), and 2) as part of a routine gynaecological examination (referred to as routine colposcopy). There are several misconceptions about routine colposcopy probably reflecting the lack of experience in using routine colposcopy. Misconceptions include: routine colposcopy is screening colposcopy, it is time-consuming, expensive, a waste of time, and the training and maintaining of colposcopic expertise is probably not sufficient in this setting. Routine colposcopy, however, is not a screening tool, it is not screening colposcopy, but capable of identifying cervical precursors and cancer, and thereby reducing the false rates of cervical cancer screening (mainly cytology). Unlike referral colposcopy, routine colposcopy is an inexpensive and rapid procedure conducted as a part of a pelvic examination and has no, or minimal, discomfort that certainly does not exceed that of smear taking, neither is it associated with any psychological burden. Routine colposcopy allows gynaecologists to be convincingly sure in their findings; ensure women having normal epithelium; evaluate abnormalities in details (without biopsy) and counsel patients immediately to alleviate the psychological effects and prepare them for a possible abnormal smear; as well as help make a diagnosis of obscure lesions.

*Key words:* Colposcopy; Abnormal cytology; Screening; Cervical cancer; CIN; AIS; Gynaecologic examination; Biopsy.

## Definition of referral and routine colposcopy

Colposcopy is practised in two ways:
– worldwide, colposcopy is mostly used to evaluate abnormal screening findings mainly, abnormal cytology and/or clinically suspicious cervix (called referral colposcopy);
– in several countries, colposcopy is a part of the routine gynaecological examination (called routine colposcopy).

### *Referral colposcopy*

Assessment of women with abnormal screening findings is done in a triage setting mostly in a colposcopy clinic. This way of practising colposcopy is called referral colposcopy because the patients are referred for a colposcopic evaluation, where, in most cases, a colposcopically directed biopsy is taken. The term referral colposcopy applies, irrespective of whether or not a biopsy is taken.

The definition of colposcopy per se does not include biopsy or endocervical sampling, but lightening and visualisation of the cervix (vagina, probably vulva) under magnification (colposcope) with application of acetic acid. Application of saline or Lugol's solution is optional, as is the use of a green filter to enhance the vascular appearance.

The objectives of referral colposcopy include:
– assessment of abnormal screening findings (abnormal cytology, HPV test, clinically suspicious lesions);
– localisation of the cervical lesion;
– identification of the site of the most severe part of the abnormality for appropriate biopsy;
– exclusion of invasive cancer, if possible;
– to tailor the amount of tissue to be excised.

Referral colposcopy may also be used:
– for surveillance of non-treated patients with low-grade or equivocal findings;
– to follow-up women who underwent treatment of cervical or vaginal lesions.

### *Routine colposcopy*

In a routine colposcopy setting, colposcopic examination of the cervix is done whenever a pelvic examination is performed irrespective of the reason women seek gynaecologists, e.g., women with amenorrhoea, infertility, abdominal pain, hormone substitution, etc., undergo colposcopy as a constituent part of their gynaecologic examination, albeit these have nothing to do with screening or cervical abnormality. i.e. routine colposcopy is practised not only in colpo-

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scopic but in gynaecologic clinics as well, thus, this is the colposcopy for routine gynaecologic practice. This way of practising colposcopy might be difficult to understand for gynaecologic oncologists dealing with female cancer and their precursors only, but might not be so for general gynaecologists.

Routine colposcopy is aiming to recognise tissue structures for what they are without biopsy. It implies fundamental knowledge and training in colposcopy with the capability of understanding the tissue basis and recognition of squamous, columnar and metaplastic epithelium as well as of colposcopic patterns and signs, changes due to atrophy and radiation effects, inflammation, etc. [1]. It is also important to be familiar with the concept of the transformation zone (TZ), including type 1-3 TZ and the clinical implications, and knowledge regarding miscellaneous colposcopic findings is also essential [1]. What routine colposcopy does not imply is biopsy, ablative or excisional treatment modalities. Management of lower genital premalignancy is a further step independent from the principle of routine colposcopy. Following the guidelines of the European Federation of Colposcopy (EFC) and the International Federation of Cervical Pathology and Colposcopy (IFCPC) colposcopy training/practise is broken down into two categories, basic and advanced colposcopy [2]. With this in mind routine colposcopy can be considered as basic colposcopy.

It should be emphasised that there is only one technique of performing colposcopy. It is not different whether it is used in a routine or referral setting. The two approaches differ only in the indication and schedule of colposcopic examination: referral colposcopy to evaluate abnormal screening results, i.e., after primary screening; routine colposcopy in all instances of gynaecologic examination irrespectively from screening.

There are several misconceptions about routine colposcopy probably attributed to the lack of experience in it. Most colposcopists around the world are experts in triaging women with abnormal smears (referral colposcopy) but may not have any experience with routine colposcopy, which might explain the misconceptions.

**The major misconceptions of routine colposcopy are:**

*1) Routine colposcopy is screening colposcopy (a screening tool)*

Cervical cancer screening has been based on cytology for decades and recently the utility of primary HPV testing is under evaluation. In the past, the value of screening colposcopy has been tested in several studies and was found impractical [2-5].

Kyrgiou *et al*. [5] in arguing against screening colposcopy, provided a theoretical model as follows: “given the known prevalence of CIN in the general population (about 1-2%) and a general acceptable false negative rate of cytology of around 20%, in a total population of 10,000 women screened, a hundred will have a pre-invasive lesion. Of those, 80 will be detected with cytology and 20 will be missed. In other words, 9,920 women will need to be referred and undergo a colposcopic examination in order to detect the 20 missed ones, assuming that colposcopy is 100% sensitive, an assumption that clearly overestimates colposcopy’s diagnostic performance. In addition, it would be expected that the majority of false negatives would probably be detected by repetition of cytology...”. Furthermore the authors deemed that ”any policy that would include colposcopy in primary screening has obvious disadvantages. Screening colposcopy is expensive, time-consuming, requires extensive training and can lead to unnecessary psychological morbidity in women. Potential long-term pregnancy-related morbidity is also an important consideration.”

Of note regarding the concept of Kyrgiou *et al*.: many nurses and general practitioners who take smears have been trained in colposcopy in the UK and they are doing well [6]. One may wonder what the goal of their training is; certainly it is not for triaging women.

Routine colposcopy, however, is not screening colposcopy, it is not a screening test; therefore, parameters used for assessing the utility and quality of any screening test are not relevant to routine colposcopy. Women are not referred to colposcopy for screening; they undergo colposcopy during smear taking, without biopsy, because colposcopy is done anyway, not for screening sake, but as a constituent of their pelvic examination.

As colposcopy is highly sensitive to identifying low- and high-grade precursors of the uterine cervix and vagina (sensitivity 87 to 99%) [7-9], with accuracy superior to cervicography [10], routine colposcopy is able to pick up CIN or glandular abnormalities missed by cytology and thereby reducing the false negative rates of cytology. This concept is supported by Chase *et al*. [11], who concluded that “colposcopy is the only means available to evaluate the cervix for more potentially advanced premalignant disease that is either missed or detected as low grade on a Papanicolaou smear alone.”

*2) Routine colposcopy is a waste of time*

Many gynaecologists (colposcopists) globally deem that colposcopy of women without a positive screening test has disadvantages; it is probably unnecessary and useless. One may wonder if this view results from experience or otherwise.

With the aims of basic colposcopy, routine colposcopy allows gynaecologists at the first instance, i.e., right at the time of the pelvic examination:

– to be convincingly sure in their findings;

– to detect lesions (HPV infection, precancer, etc.) not visible to the naked eye, missed by cytology.

High-grade CIN and glandular changes are subclinical and cannot be detected macroscopically. It is a devastating experience for a woman being told that her gynaecologic examination is negative and having high-grade cytology.

– to ensure women having normal epithelium;

– the negative predictive value of colposcopy approaches 100%, therefore women with negative colposcopic findings in the presence of a fully visible transformation zone (type I and II TZ) can be ensured at the time of their pelvic examination that they do not have any abnormality. This is most relaxing while waiting for the result of the screening test.

– to evaluate abnormalities in detail (without biopsy), including determination of the grade of atypia, if any; identifying microinvasion, if possible, and localisation of the lesion, and counsel patients immediately to alleviate the psychological effects and prepare them for the possibility of getting a positive screening result.

In the referral colposcopy setting patients are prompted to make an appointment at the colposcopy clinic. The waiting list may be quite substantial and the process is invariably associated with anxiety and psychological stress, etc. [12];

– to help make a diagnosis of obscure lesions (healing or granulation tissue, etc.); including ruling out high-grade abnormality.

*3) Low level of training and maintaining expertise in a routine colposcopy setting*

Training and education in colposcopy is based on health policy in each country and therefore there are differences even within Europe. In most parts of the European Union and in the United States, expertise in colposcopy requires special training and education in colposcopy centres and, indeed, the learning curve is quite long. Estimations include a training period of four months to accurately recognize SIL, and an additional year to identify the optimal site for directed punch biopsy. The European Federation of Colposcopy (EFC) has provided a training programme with minimum standards (51 core competencies) deemed essential for competent colposcopy practise, each of which is a learning objective [13]. This is a comprehensive and heterogeneous training programme, consisting of routine elements of gynaecological examinations (e.g., how to insert vaginal speculum, history taking, positioning of patients, etc.), which all gynaecologists should know from the outset, as well as communication skills, basic surgical techniques (e.g. biopsy ) and mostly skills related to colposcopy itself. The main objective of colposcopy training includes learning the tissue basis of colposcopic findings and having the ability to accurately recognise and interpret the colposcopic features. The aiding and technique of biopsy and other treatment modalities as well as novel approaches to enhance diagnostic accuracy are secondary in the colposcopic curriculum and – as noted previously – are not included in colposcopy per se.

Like colposcopy practice, the training and education in colposcopy can also be accomplished in two ways: a) as part of residency training in obstetrics and gynaecology in the same way as cystoscopy is included in the urological residency programme or b) in colposcopic centres. Whichever applies, the core curriculum of colposcopy can and should be learned. However, the approach is basically different in these two settings:

– In the residency setting, the trainees perform colposcopy whenever they do a gynaecological examination (huge number of cases), seeing a normal cervix and vagina in the vast majority. Thus, the trainees mostly become familiar with the physiological appearance of the lower genital tract and recognise abnormalities as different from normal. A concern is that the stipulated number of abnormal colposcopic features seen by the residents cannot be achieved in this way. However, this is not the case, because during the six years of apprenticeship, even the relatively rare cases are available for studying and the caseload of abnormal colposcopic findings is usually appropriate for proper education in colposcopy; residents receive training in colposcopy and managing abnormal cytology in the same way that they are trained in ultrasound scanning, laparoscopy, etc.

– The education and training in colposcopy centres is achieved the other way round. In this setting, more abnormal colposcopic findings are evaluated and, in fact, there may be a shortage of normal colposcopic findings, since women with normal cervices are rarely referred to a colposcopic centre. This is a real concern.

Although colposcopists in these centres invariably manage more patients with abnormal colposcopic findings, the standard number of cases required for maintaining expertise in colposcopy is available for the general gynaecologist in the routine colposcopy setting, provided he or she has at least an average work load.

Whatever the approach, training, skills and evidence-based practice with outcome-based audit is a prerequisite for professional colposcopy.

*4) Routine colposcopy is time-consuming*

One of the arguments against using colposcopy in a routine setting is that colposcopy takes 10-15 minutes to be performed; consequently not more than four to five patients can be examined in an hour, which makes colposcopy useless in this context. Having used colposcopy routinely, i.e., as part of every pelvic examination, on a daily basis for almost half a century, I can assure that to identify the normal cervix, TZ and whether or not there is any abnormality, does not

require more than a minute or two. Only acetic acid application is needed, and the use of Lugol's solution does not add much, if any to it. Fine versus course punctation, mosaic, etc., and even the presence of atypical vessels can easily be diagnosed during this time-frame, as can the localisation of the lesion be determined.

Detailed analysis of abnormal lesions is important when biopsy is directed and it takes time (not more than 4-5 minutes according to my experience); this is, however, an extended diagnostic procedure and is beyond routine colposcopy per definition.

In summary, routine colposcopy is not and obviously cannot be time-consuming, because any procedure taking 5-10 minutes to perform by no means is feasible to be included in the routine gynaecologic examination.

*5) Routine colposcopy is expensive*

When calculating the price of referral colposcopy, one should make a clear distinction between the cost of the colposcopic examination itself and the cost of the additional biopsy and histology with or without treatment. However, depending on the national health policies, the cost may be calculated as a package price. Nevertheless, referral colposcopy is expensive: the average cost of colposcopy and biopsy was $436 per patient in 2002 in the United States [14].

The price of routine colposcopy is included in the cost of the gynaecological examination and it is not additional and it does not make gynaecologic examination more expensive. The only extra cost is the price of the colposcope. You may buy a terribly expensive colposcope and say that routine colposcopy is costly; however, in practise a normal colposcope with low and higher magnification and a green filter will be perfectly satisfactory. Extras such as a camera, video, computer imaging technology, database, etc., can be helpful in several ways, but do not improve your expertness in colposcopy. Thus, routine colposcopy is cost-effective and far less expensive than referral colposcopy. The cost of excisional or ablative treatment is irrelevant to that of routine colposcopy.

Several measures have been taken in referral settings to reduce the number of referrals for colposcopy, not only because of the price, but also due to the associated psychological burden. For instance, Pretorius *et al*. [15] advocated a 2-year referral interval for colposcopy, instead of yearly colposcopy, for women with CIN1 or less on biopsy whose high-risk HPV test remains positive but cytology is normal; annual colposcopy is indicated only if the cytology is also abnormal. They admit, however, that with this approach there might be a small chance of missing CIN3. With routine colposcopy these kinds of dilemmas just do not exist.

*6) Routine colposcopy is associated with psychological burden*

There is compelling evidence that referral to a colposcopic clinic is almost always associated with a significant negative psychological effect with the STAI (strait-trait anxiety inventory) [16] score of 51 (scoring range 20-80, the average value for normal adult women is 35) [12, 17]. Some may argue that this anxiety could be due to having an abnormal smear or due to fear of the underlining HPV infection. Freeman-Wang and Walker, however, highlighted the importance of fear and anxiety from the colposcopic examination itself, as patients poorly understand colposcopy [12]. Women realise that they are facing an investigation for which they are prompted, which usually includes cervical biopsy, is uncomfortable, painful and embarrassing. Indeed, studies suggest that the level of distress and discomfort attached to referral colposcopy is more strongly related to anticipation of the procedure than its actual outcome [12]. Long waiting lists can increase the psychological burden.

Experience with routine colposcopy does not show significant, if any, anxiety or distress associated with it. Women are not referred for further assessment, and they are informed immediately. In addition, they hardly notice the colposcopic examination itself, because insertion of the vaginal speculum with exposure and cleaning of the cervix is done anyway during gynaecological examination. Thus, any "extras" such as application of acetic acid do not cause much discomfort, which certainly does not exceed that of smear taking. You may even lessen anxiety by saying "I will just examine your cervix with magnification using the colposcope. This will not cause any harm, it is not painful at all, and it only takes a minute or two, etc.".

## Discussion

This paper is not a review of the literature rather an expert opinion with the only aim to inform colposcopists worldwide about some misconceptions regarding routine colposcopy. The purpose is by no means to argue in favor of routine colposcopy, and it has no intention either to compare routine colposcopy with referral colposcopy in terms of advantages and disadvantages. The sole objective is information as to what routine colposcopy is all about. In fact, not much has been published on that.

In some countries, routine colposcopy is practised traditionally. This is fact and is not a matter of argument whether it is advantageous or a waste of time and money, etc. It is also a fact that routine colposcopy has never been tested in randomised, controlled studies whether there is statistically significant evidence for supporting its use. Tradition and experience, however, are strong arguments to substantiate routine colposcopy.

Referral and routine colposcopy are performed exactly the same way; technically there is no difference between the two. The basic difference between the two approaches is that in routine colposcopy there is no waiting list with all drawbacks attached to it, and the majority of women undergoing colposcopy has negative findings.

In conclusion: routine colposcopy is performed at the time of gynecological examination as part of it with minimal or no discomfort at the expense of 1-2 extra minutes but no extra cost. Thus, it is cheap and does not require another appointment should cytology be abnormal or during follow-up, consequently it is devoid of psychological distress of referral for colposcopy.

Routine colposcopy may identify low- or high-grade abnormalities missed or falsely diagnosed by cytology, thereby improving screening efficacy also it may help make a diagnosis of obscure lesions in the lower genital tract.

Recognising abnormal lesions at the time of smear taking, women can be prepared for possibly having abnormal cytology, minimising thereby their psychological distress. Most importantly, in the presence of normal colposcopic findings, it allows colposcopists to reassure women immediately that they do not have a significant lesion, which substantially alleviates anxiety while getting the results of a screening test.

Obtaining skills in colposcopy and maintaining a high level of expertise is deemed feasible during residency and in a routine colposcopy setting provided gynaecologists have at least an average workload and evidence-based practice with outcome-based audit is maintained.

In the author's experience of over 40 years, routine colposcopy is an invaluable tool. One of its major advantages includes lots of information far beyond the scope of the naked eye gained during pelvic examination in terms of making and confirming diagnosis or ruling out abnormality, and the opportunity to discuss those with the patient immediately; a practice most rewarding and relaxing.

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