Quick Review: Cervical Cancer

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Citation

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Abstract

Cervical
Cancer is now the second most common cancer among women - due mostly to the use of Pap Smear. It is said to serve as \"the model for controllable cancer\" in the sense that \"controllable\" means: (1) there is an identifiable precursor lesion (cervical intraepithelia neoplasia) with a natural history of usually-slow progression; (2) there is a cheap and noninvasive screening test (the Pap smear) and a follow-up diagnostic procedure (colposcopy); and (3)there are simple and effective treatments for the precursor lesions (cryotherapy, laser ablation, cone biopsy) with high cure rates.

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1. there is an identifiable precursor lesion (cervical intraepithelia neoplasia) with a natural history of usually-slow progression
2. there is a cheap and noninvasive screening test (the Pap smear) and a follow-up diagnostic procedure (colposcopy)
3. and there are simple and effective treatments for the precursor lesions (cryotherapy, laser ablation, cone biopsy) with high cure rates

Even when disease progresses beyond the precursor level, improved treatments have increased cure rates of Stage 1a and 1b to approximately 90%. A discussion of cervical neoplasia must begin at the Squamocolumnar Junction. It is this area of “transformation zone” from which 95 % of the squamous intraepithelial neoplasias arise. Proximal to the 'SCJ' is glandular epithelium of the endocervix; distal to the 'SCJ' is squamous epithelium of the “portio”. The area between these two different cell types is the “transformation zone”. During development and sexual maturation the SCJ moves more proximal to involve a lesser area of the ectocervix; with hormonal influences from the maturing ovary, this zone usually lies just outside the external cervical os. The reddened or orange-red tissue surrounding the external os is the glandular epithelium of the endocervical canal. Through repeated trauma and chronic exposure, this area of transformation normally has some degree of squamous metaplasia. However, in some patients with carcinogenic exposure this area may begin to undergo abnormal maturation and thus begin the process of intraepithelial neoplasia. Specific agents have been associated with the development of dysplasia (and eventual neoplasia): cigarette smoke, intercourse at a young age, and HPV exposure (and thus, the number of sexual partners becomes a factor). HPV is speculated to act as a “cofactor” in the abnormal maturation and mitotic process of the epithelial cells within the transformation zone. Certain types of HPV are known to be more-carcinogenic than others at present date (e.g. 16, 18).

The Pap smear was developed in the 1940's to serve as a means of detecting changes in cellular morphology. It's accuracy is based on several factors: the degree of cervical inflammation and corresponding infection, the adequacy of the specimen obtained (is it of the right area or not), and the proper fixation to avoid air-drying. All of these can obscure early dysplastic changes and thus, lead to a “negative” Pap smear. According to lecture the False Negative Rate of Pap Smear is approximately 20 %. ACOG recommends that the first Pap smear be obtained at the age of 18 or when the woman becomes sexually active and yearly thereafter.

There are several ways to classify the pap smear, which has

lead to some confusion. The two mentioned in this case are: CIN System - a method to provide a description of the degree of abnormality (with CIN-I meaning mild dysplasia, CIN-II meaning moderate, and CIN-III meaning severe dysplasia). The term dysplasia describing intraepithelial cellular abnormalities such as an increased nuclear-cytoplasmic ratio, an increased staing of chromatin material, a less-orderly maturation pattern. Bethesda System - which describes squamous intraepithelial lesions (SIL) as “low-grade” or “high-grade”. These different classifications (and others) are all based on the likelihood of progression of the precursor lesions to more advanced degrees.

Considering all cases of mild dysplasia - CIN-I, Class II or III, or low-grade SIL (as seen in this pt), approximately 65 % will spontaneously regress, 20 % will remain the same, and the remaining 15 % will progress to worsening disease. Since there is no definite way of foretelling which lesions will regress and which will worsen, all (ALL) abnormal Pap smears must be further evaluated ! This involves histologic diagnosis of both nature and grade of the dysplasia (carcinoma) which is accomplished by Colposcopy-diected biopsy (or cone biopsy).

Colposcopy is the direct visualization of the entire SCJ under variable magnification. The visualization is assisted by either acetic acid (which acts as an epithelial dessicant to “highlight” dysplastic regions) or by Lougall's solution (which is a glycogen - cytoplasmic stain that will darken normal cells but - with the increased nuclear/cytoplasmic ratio seen in abnormal cells - will not be taken up in dysplastic regions). Other findings of abnormalities include: vascular patterns, punctuations, and “plaques”. The abnormal regions are then biopsied and evaluated. After sampling the directed lesions, ECC (endocervical curettage) is performed to obtain tissue from the endocervix - which can not be directly visualized - to rule-out potential disease. The ECC will be positive for dysplasia in 5 - 10 % of women with an abnormal Pap smear.

There are 3 reasons for Cervical Conization (which is a cone-shaped specimen obtained form the cervix under general anesthesia which includes the SCJ, the identified lesions on the exocervix, and a portion of the endocervical canal):

1. inadequate colposcopy - can not visualize the entire SCJ

2. Positive ECC
3. “2-Step” difference between the Pap Smear and Colposcopy results.

This procedure may, at times, be therapeutic as well as diagnostic (removal of the entire lesion with “clear margins”). The risks associated with this procedure include: infection, blood loss, anesthesia, and, if the woman is interested in future pregnancy, the possibility of Cervical Incompetence. By obtaining, the entire SCJ and nearby cervical tissue, the pathologist can determine the extent of disease - and thus provide a much-better estimate of stage.

Treatment of CIN involves the basic concept of excision (or ablation) of the superficial precursor lesion will avoid progression to Carcinoma ! However, some controversy does surround the issue of “best treatment”. According to lecture, with low-grade lesions (CIN I), it is “completely acceptable” to follow these pts with serial Pap smears since this grade carries such a high rate of spontaneous regression. More aggressive treatments include:

Cryocautery - especially with a “double freeze” technique is highly effective and carries a cure rate of approximately 90 %. Healing can take up to 5 weeks and can be associated with a profuse watery discharge but is usually completed within 2 months and follow-up Pap smear can be conducted in 3 months to look for the effectiveness of the procedure. Laser ablation has also been an option - but is usually reserved for higher- grade lesions because the depth of the ablation can be adjusted to the extent of disease. As mentioned earlier, excisional biopsy is always an option. either by cold-knife (which will give “clean margins”) or by laser.

Given any method of treatment, either “conservative” or “aggressive”, close follow-up is Critical. Repeat Pap Smears should be conducted at 3 month intervals for the first year and assuming that they remain normal, at 6 month intervals for the second year, and then annually beginning the third year. The goal must always be remembered: to prevent carcinoma

References

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