

Cytology of the Cervical Canal

The nonkeratinized stratified squamous epithelium that lines the vagina and covers the exocervix is arranged in layers similar to those of the epidermis. Deepest is the basal layer (stratum germinativum); followed by an intermediate (spinous) layer and a superficial layer (stratum corneum) from which cells are shed. Desquamated cervical cells can be recovered from vaginal secretions, or cells can be obtained more directly by gentle abrasion of the exocervix. The cells can be studied in smear preparations, and examination of Papanicolaou's ("Pap") smears has become a standard procedure for early detection of cervical cancer. In normal women, four types of cells usually are recognized cytologically, loosely corresponding to the layers of the cervicovaginal epithelium. These include basal (lower basal) cells, parabasal (outer basal) cells, intermediate (precornified) squamous cells, and superficial (cornified) squamous cells. Germinal cells from the basal layer are exceedingly rare in smears from normal adults, and the basal and parabasal cells recognized cytologically are derived from different levels of the intermediate layer. They do represent less mature cells, and their presence indicates that immature cells are at higher than normal levels in the epithelium. These cells are associated with marked deficiency of estrogens and are common before puberty and during menopause. Basal cells arise from the lower levels of the transitional zone and are rounded or oval cells, about 4 to 5 times the size of a granular leukocyte. The central nucleus is deeply stained, but a pattern of fine chromatin granules and dense patches can be made out. In some cells a Barr body is distinctly visible. The moderate amount of basophilic cytoplasm stains deeply and evenly. Parabasal cells arise higher up in the transitional zone and also are round or oval cells, but they are larger than basal cells with a more abundant cytoplasm that is less basophilic and often shows a somewhat "blotchy" pattern. The central nucleus remains about the same size but may be denser than that of a basal cell. Intermediate squamous cells vary in size, but all appear as thin, polygonal plates with abundant transparent cytoplasm. The nucleus is smaller, vesicular, and centrally placed. The cytoplasm stains somewhat variably and may be lightly basophilic or show some degree of eosinophilia. Superficial squamous cells represent dead surface cells. They are large, with voluminous eosinophilic cytoplasm that is thin and transparent with sharply defined borders. Because of the thinness, the cytoplasm often is curled, wrinkled, and folded. The nucleus is very small - about one-half to one-third that of an intermediate squamous cell - and is densely stained and pyknotic. The superficial and intermediate squamous cells are the largest cells seen in a routine preparation and range from 40 to 50 μm in diameter. Occasionally, anucleate squamous cells may be found. They have a somewhat shriveled appearance, and the site of the nucleus is suggested by a pale central zone. They represent cells that are more completely cornified. Cells that originate from the endocervix also may be present and often occur in small sheets or strips; their appearance depends on the orientation. From end on, the cells appear as groups or nests of small polyhedral or round cells with sharp cell boundaries and relatively large central nuclei. In profile, the cells show their columnar shape with the nuclei close to one pole. Strips of these cells give a "picket fence" appearance.