

particularly the posterior wall at the junction with the ectocervix. The lesions in the lower two thirds of the vagina metastasize to the inguinal nodes, whereas lesions in the upper vagina tend to spread to regional iliac nodes.

Embryonal Rhabdomyosarcoma

Also called *sarcoma botryoides*, this uncommon vaginal tumor composed of malignant embryonal rhabdomyoblasts is most frequently found in infants and in children younger than 5 years of age. These tumors tend to grow as polypoid, rounded, bulky masses that have the appearance and consistency of grapelike clusters (hence the designation *botryoides*, or grapelike) (Fig. 22-11). The tumor cells are small and have oval nuclei, with small protrusions of cytoplasm from one end, resembling a tennis racket. Rarely, striations (indicative of muscle differentiation) can be seen within the cytoplasm. Beneath the vaginal epithelium, the tumor cells are crowded in a so-called cambium layer, but in the deep regions they lie within a loose fibromyxomatous stroma that is edematous and may contain many inflammatory cells. Such lesions can be mistaken for benign inflammatory polyps. The tumors tend to invade locally and cause death by penetration into the peritoneal cavity or by obstruction of the urinary tract. Conservative surgery coupled with chemotherapy offer the best hope, particularly in cases diagnosed sufficiently early.



Figure 22-11 Sarcoma botryoides (embryonal rhabdomyosarcoma) of the vagina appearing as a polypoid mass protruding from the vagina. (Courtesy Dr. Michael Donovan, Children's Hospital, Boston, Mass.)

CERVIX

Anatomically the cervix consists of the external vaginal portio (ectocervix) and the endocervical canal. The ectocervix is visible on vaginal examination and is covered by a mature squamous epithelium that is continuous with the vaginal wall. The squamous epithelium converges centrally at a small opening termed the *external os* that leads to the endocervical canal. The endocervix is lined by columnar, mucus-secreting epithelium. The point where the squamous and columnar epithelium meet is referred to as the *squamocolumnar junction* (Fig. 22-12). The position of

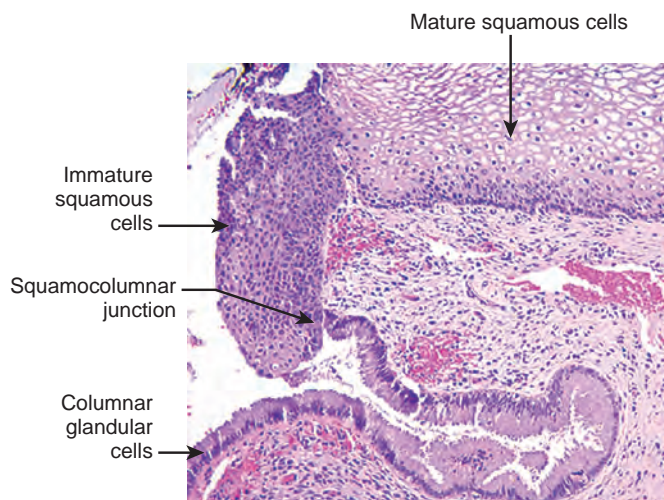


Figure 22-12 Cervical squamocolumnar junction showing mature, glycogenized squamous epithelium, immature squamous metaplastic cells, and columnar endocervical glandular epithelium.

the junction is variable and changes with age and hormonal influence, but in general the junction moves upwards into the endocervical canal with time. The replacement of the glandular epithelium by advancing squamous epithelium is a process called squamous metaplasia. The area of the cervix where the columnar epithelium abuts the squamous epithelium is termed the "*transformation zone*." The unique epithelial environment of the cervix renders it highly susceptible to infections with HPV, the main cause of cervical cancer. Immature squamous metaplastic epithelial cells in the transformation zone are most susceptible to HPV infection, and as a result this is where cervical precursor lesions and cancers develop.

Inflammations

Acute and Chronic Cervicitis

At the onset of menarche, the production of estrogens by the ovary stimulates maturation of the cervical and vaginal squamous mucosa and formation of intracellular glycogen vacuoles in the squamous cells. As these cells are shed, the glycogen provides a substrate for various endogenous vaginal aerobes and anaerobes, but particularly lactobacilli, which are the dominant microbial species in the normal vagina. Lactobacilli produce lactic acid, which maintains the vaginal pH below 4.5, suppressing the growth of other saprophytic and pathogenic organisms. In addition, at low pH, lactobacilli produce bacteriotoxic hydrogen peroxide (H_2O_2). If the pH becomes alkaline due to bleeding, sexual