Artifacts, Contaminants, and Incidental Findings

Common Pap Test Artifacts

Air-drying artifact: predominantly seen in conventional smears and result in polychromatic staining, cellular and nuclear enlargement (Fig. 18.1).

Brown artifact: "corn flakes," air-trapping under cover slip—"brown cell" artifact (Fig. 18.2).

Brush artifact: glandular crowding; aggressive sampling via an endocervix brush.

Lubricating jelly: may contaminate Pap smears; amorphous material with a blue tinge.

Contaminants in Pap test: contaminants may be intrinsic or extrinsic.

Extrinsic: are more common and presumably derived from the tap water used in the Papanicolaou staining procedure, in the air or on the hands of the laboratory technician.

Intrinsic: are less common (e.g., air-drying: "corn flakes"; Table 1).

Additional Contaminants in the Pap Test

Alternaria: brown color, segmented body, likened to "snowshoe" (Fig. 18.3).

Aspergillus spp.: may be a contaminant in a Pap or may represent an active infection in people on prolonged antibiotic treatment or in immunocompromised women with isolated cutaneous aspergillosis of the labia minora. The fungi form a conidial head or a "fruiting body" that produces spores in cavities (aspergilloma). The fruiting body is important in aspergillus species identification and in distinguishing the fungus from its mimics, such as Zygomycetes and Candida spp. (Fig. 18.4).

Insects (arthropods): appearance depends on the insect and the body part seen.

Ova of Enterobius vermicularis (also known as a pinworm or roundworm): ovum of E. vermicularis are the most common ova to be seen in a Pap test. These have elongated oval shapes with flattening of the ventral sides and double-contoured translucent shells folded at one end. Smear usually shows acute inflammation.

Chaetomium: dematiaceous fungus that is widely encountered in soil and degrading plant material. The hyphal structures are characteristically septate, long, somewhat broad, and regular, measuring approx 4 μm in diameter and show no branching. The spores (ascospores) are usually numerous, lemon-shaped, a homogenous olive-brown color, smooth walled, and measure 8 x 10 μm in size. In rare cases of immunocompromised individuals, Chaetomium species can cause systemic and invasive infections with a fatal outcome (Fig. 18.5).

Pollen: common types show a double-layered wall and "air sacs" (Fig. 18.6).

Incidental Findings in the Pap Test

Collagen balls: usually occur in serous cavities, rare in the Pap test, consists of a three-dimensional structure with a hyalinized core and surrounded by benign-appearing cells. They may be transported via the fallopian tubes to the cervix.

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Psammoma bodies: calcified concentric structures. They may be associated with malignant tumors (serous carcinomas of the ovary or the uterus) or nonneoplastic conditions, such as endosalpingiosis or mesothelial hyperplasia (Fig. 18.7).

Hematoidin crystals: often associated with hemorrhage during pregnancy, pregnancy-like, and postpartum states, golden in color, radially arranged fine needles forming cockleburs or as aggregates of small irregular particles, spherules, or rhomboids (Fig. 18.8).

Curschman’s spirals: morphologically identical to those seen in the sputum. They are only seen in patients with a cervix and may form in endocervical mucus, but are of no clinical significance.

Herxheimer spirals: bundles of tonofibrils visible with an ordinary light microscope, which appear as a twisty, intracytoplasmic eosinophilic structure (Fig. 18.9).

Other findings: dried mucus (Fig. 18.10), carpet beetle (Fig. 18.11), and ferning (Fig. 18.12).

<table>
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<tr>
<th>Contaminants</th>
<th>Organisms that it may be mistaken for</th>
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<tr>
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<td>Cotton fibers</td>
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<td>Fibrinous debris</td>
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<td>Mucus</td>
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<td>Vegetable cells</td>
<td>Squamous metaplasia</td>
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<tr>
<td>Other fungi</td>
<td>Candida spp.</td>
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Fig. 18.1. Air-drying artifact shows cellular and nuclear enlargement with eosinophilic staining of the nuclei (conventional smear; Papanicolaou stain).