ThinPrep® Pap Test Diagnostic Challenges and Differential Diagnoses

ThinPrep® Characteristics

- Wet Fixation
  - enhanced cytoplasmic and nuclear detail
  - variability in nuclear staining
- Cell Size
  - proportionately smaller
  - single cells more prominent
  - cells may round up in solution e.g.. adenocarcinoma
- Smear Pattern
  - Cellular material not pulled out in mucous
  - Mechanical artifacts eliminated
- Specimen Background
  - Cellular debris may appear clumped

Differential Diagnoses

- Endocervical Adenocarcinoma vs. Poorly Differentiated Squamous Cell Carcinoma (SCC)
- Endocervical Adenocarcinoma vs. Endometrial Adenocarcinoma
- Endometrial Adenocarcinoma vs. Small Cell Squamous Carcinoma
- Adenocarcinoma-in-situ vs. Tubal Metaplasia
- HSIL vs. Single Endometrial Cells
- HSIL vs. Immature Squamous Metaplasia
- Poorly Differentiated Squamous Cell Carcinoma vs. Repair

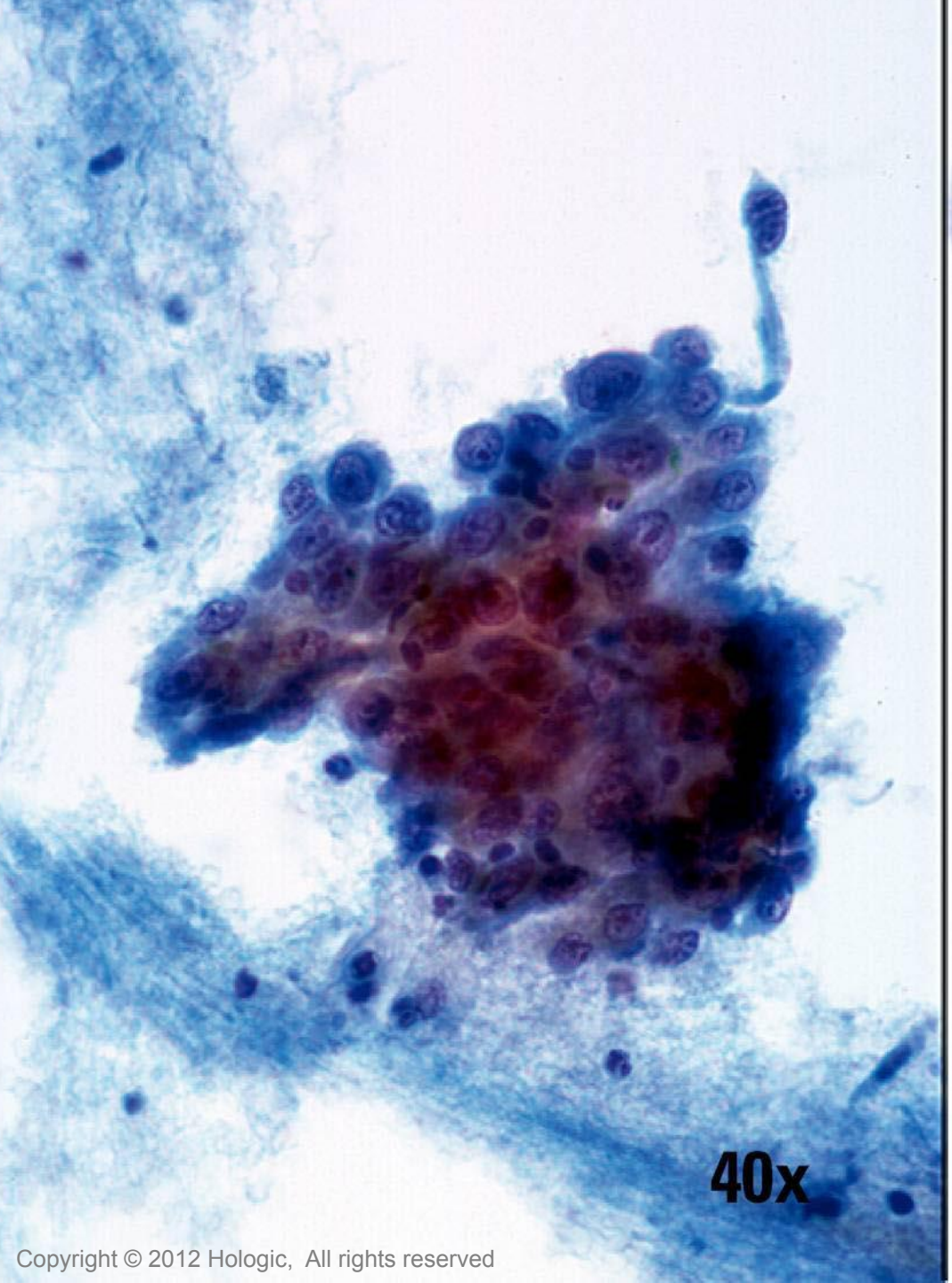
Poorly Differentiated Squamous Cell Carcinoma vs. Endocervical Adenocarcinoma

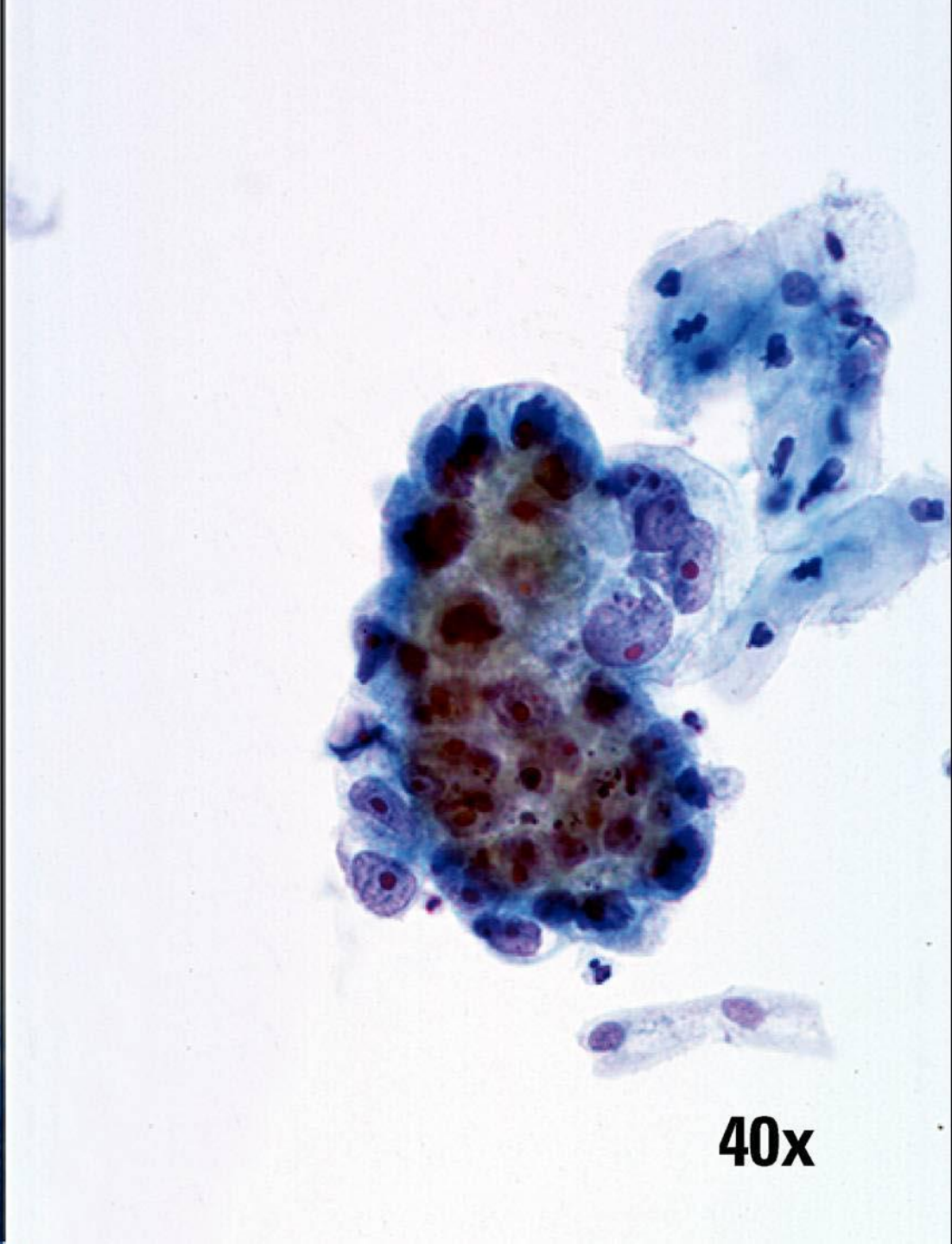
Poorly Differentiated SCC

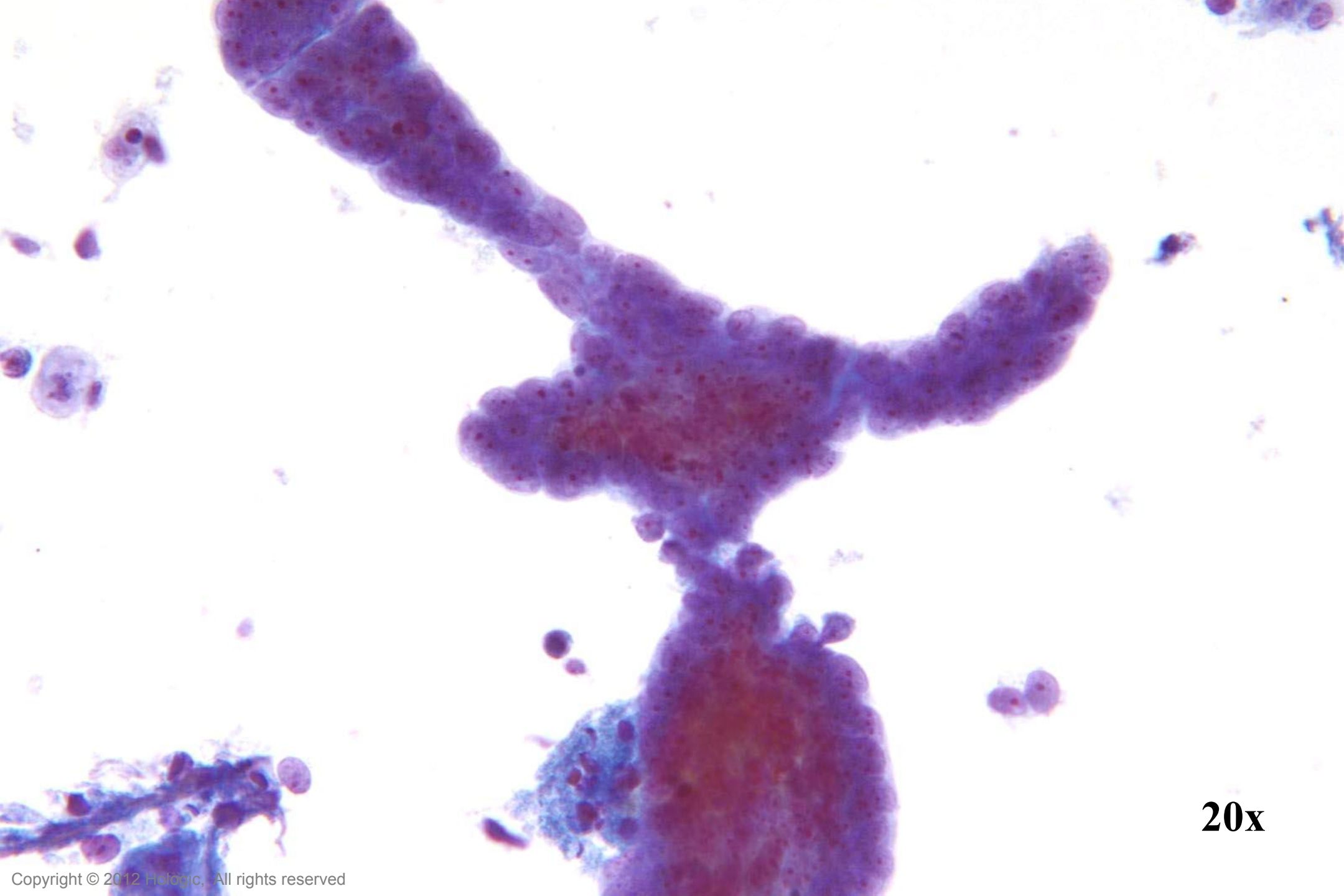
- 2D sheets and single cells
- Ragged group edges
- Dense, homogenous cytoplasm
- Pleomorphism, irregular nuclear shapes and sizes
- Irregular chromatin clumping
- Nucleoli variable in shape, size, number and position

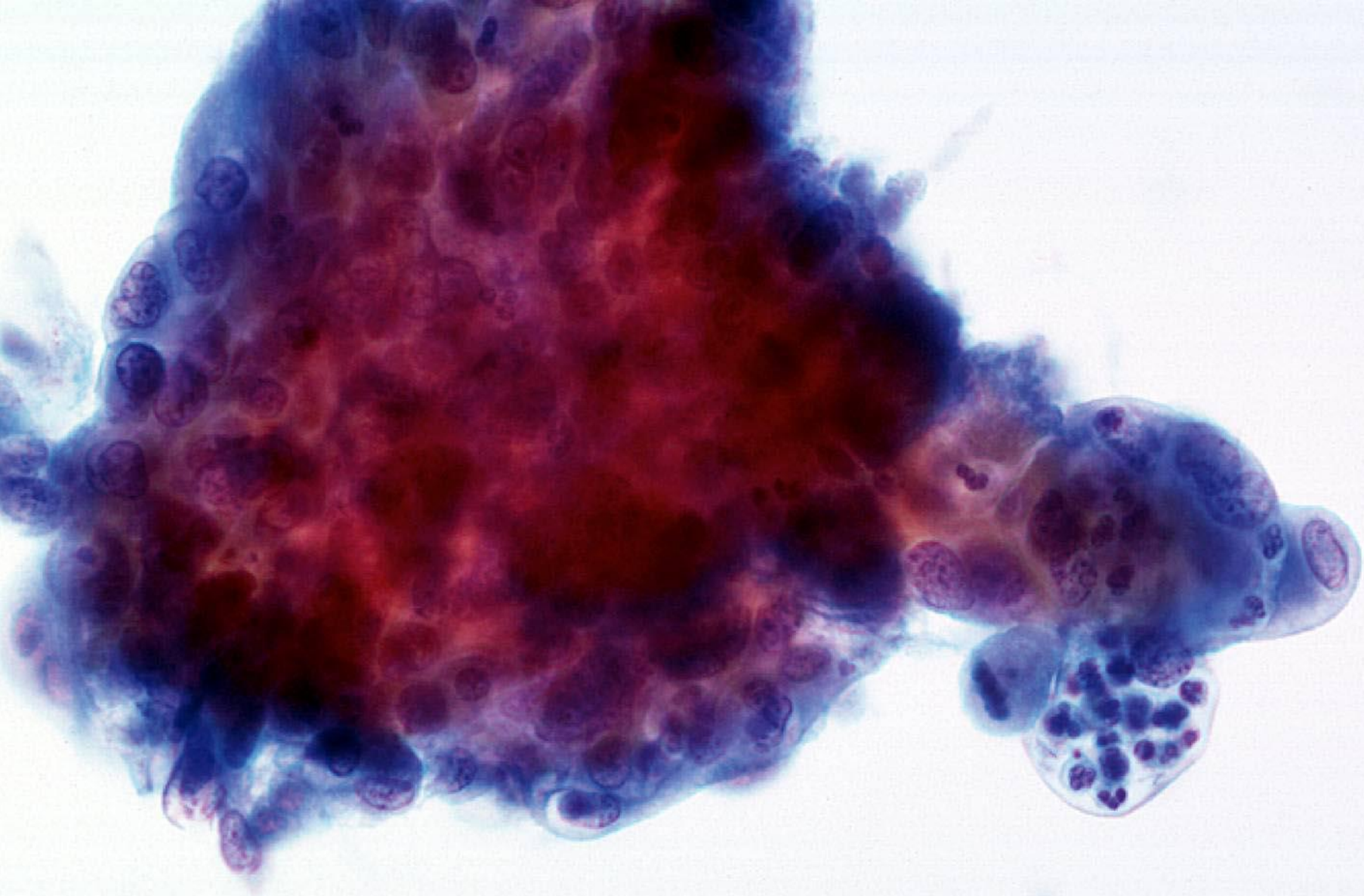
Endocervical Adenocarcinoma

- 3D cell groupings
- Common group borders
- Delicate, foamy cytoplasm
- Enlarged nuclei, commonly round/oval
- Parachromatin clearing
- Round, central, single or multiple macronucleoli









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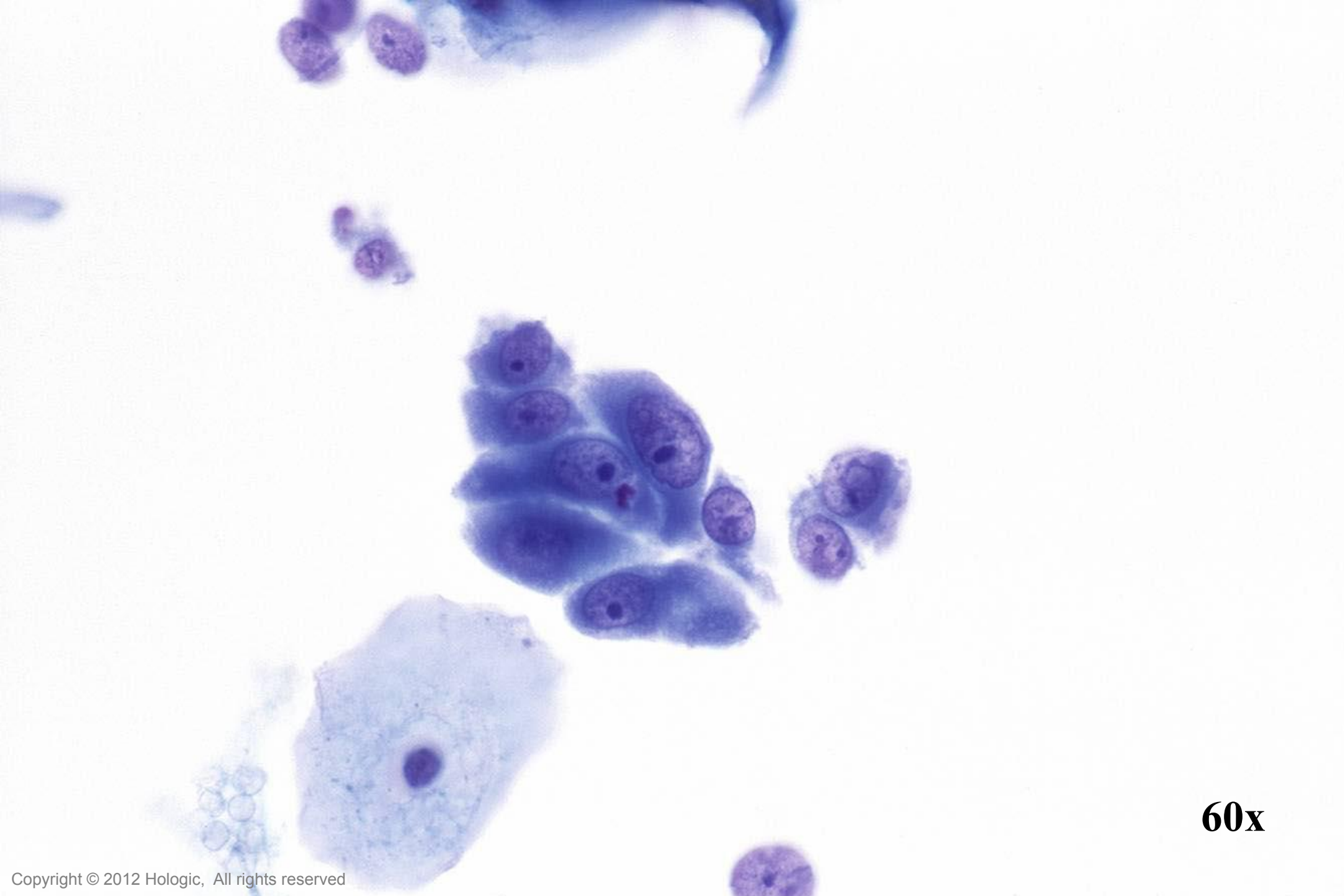

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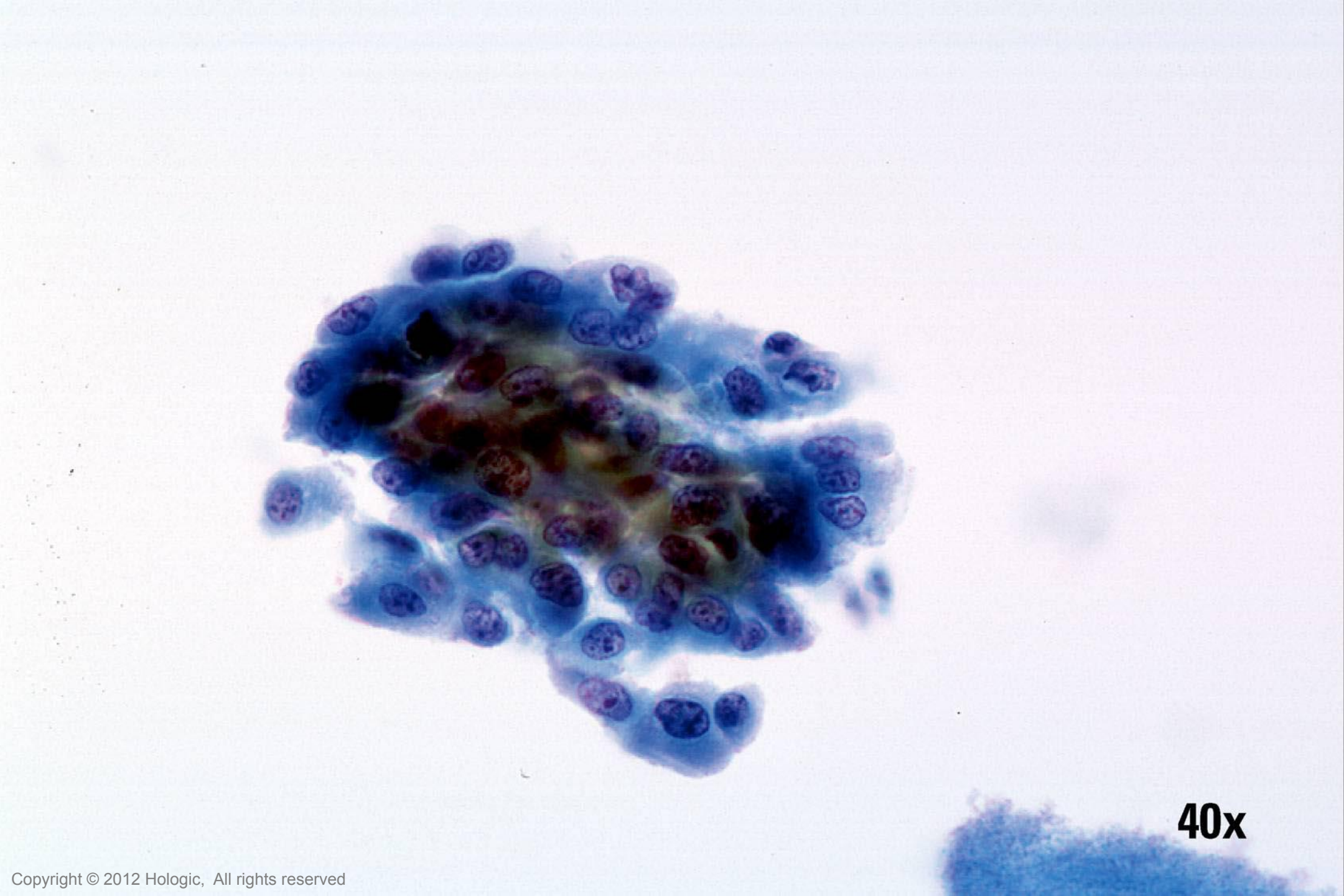
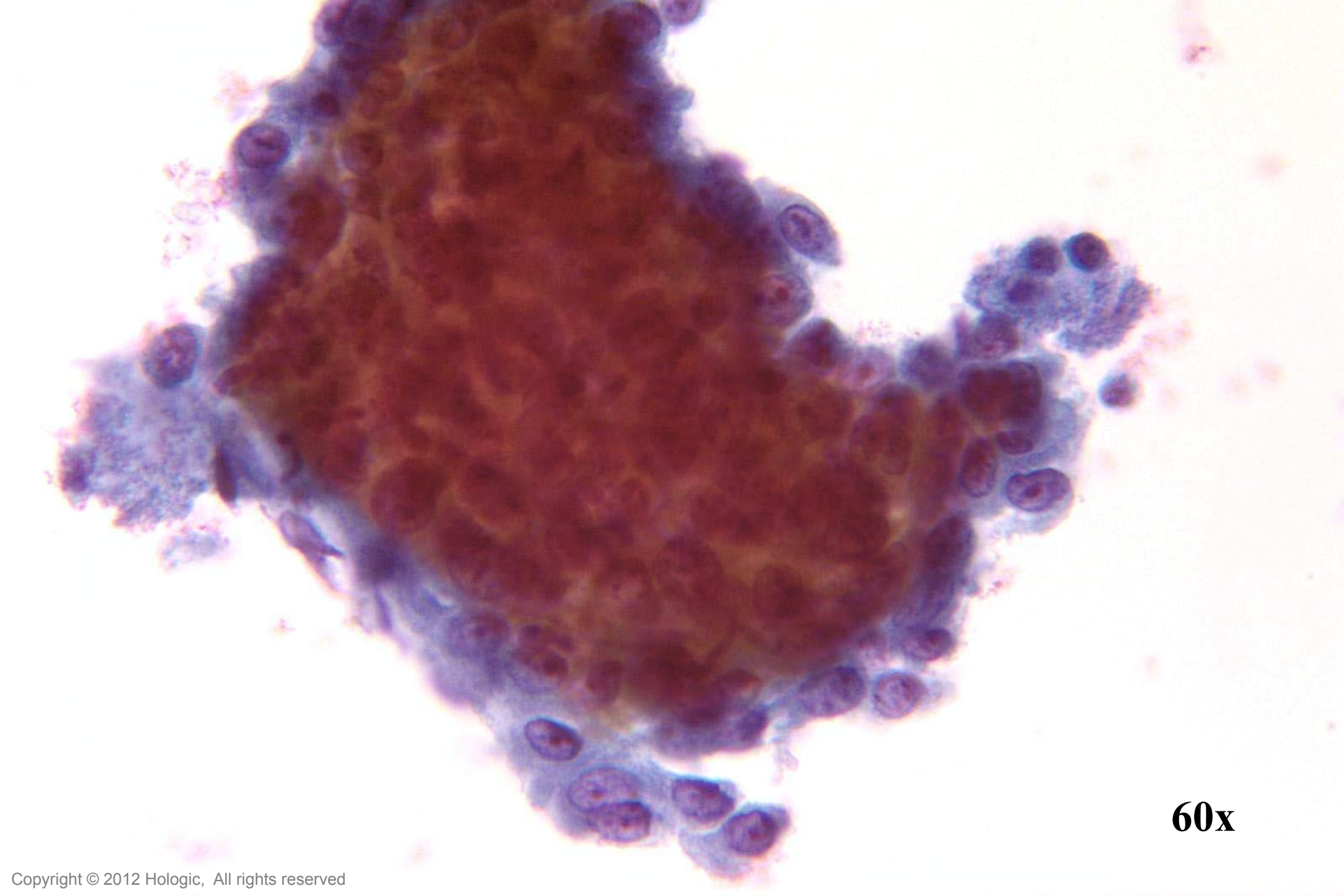




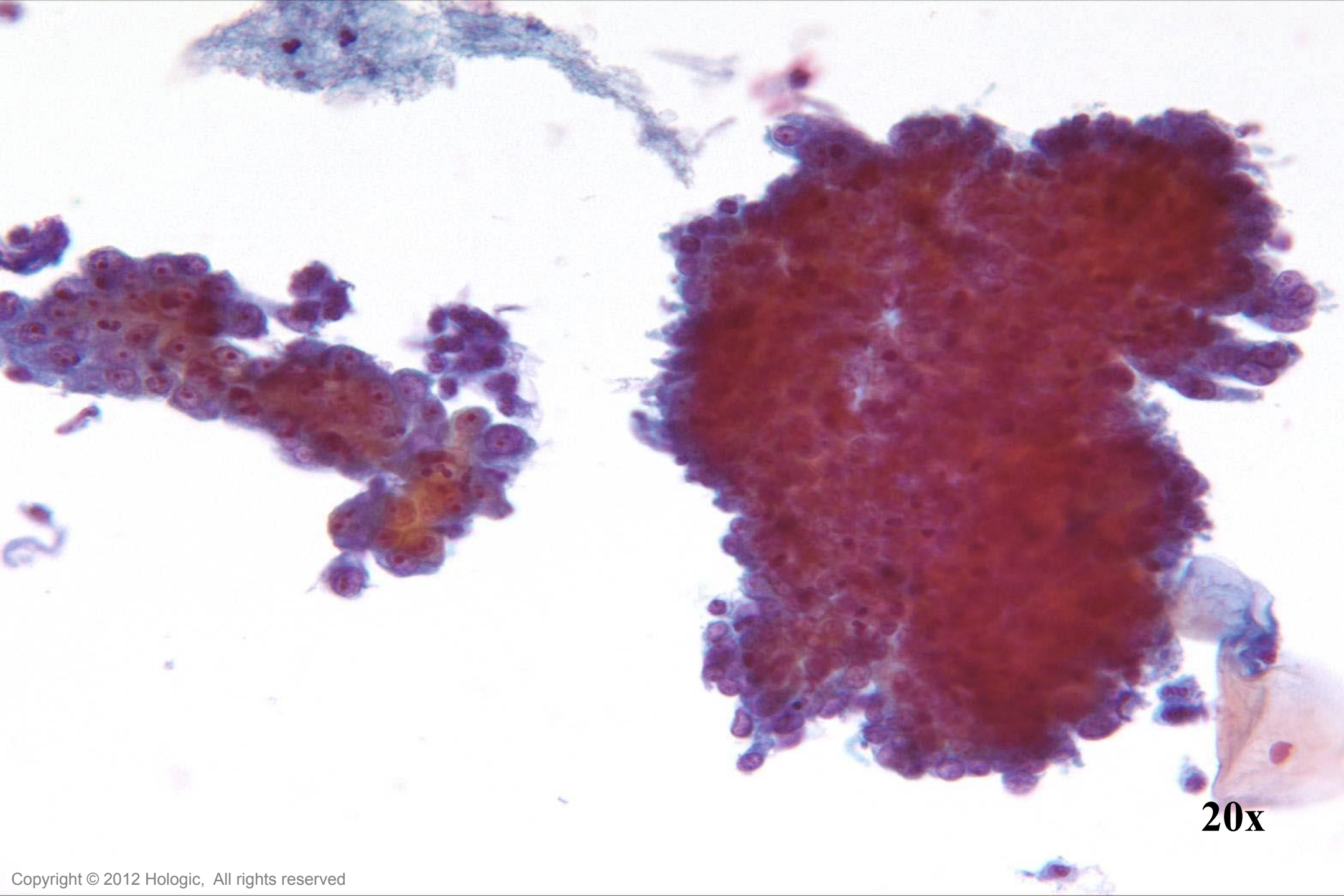
Endocervical Adenocarcinoma vs. Endometrial Adenocarcinoma

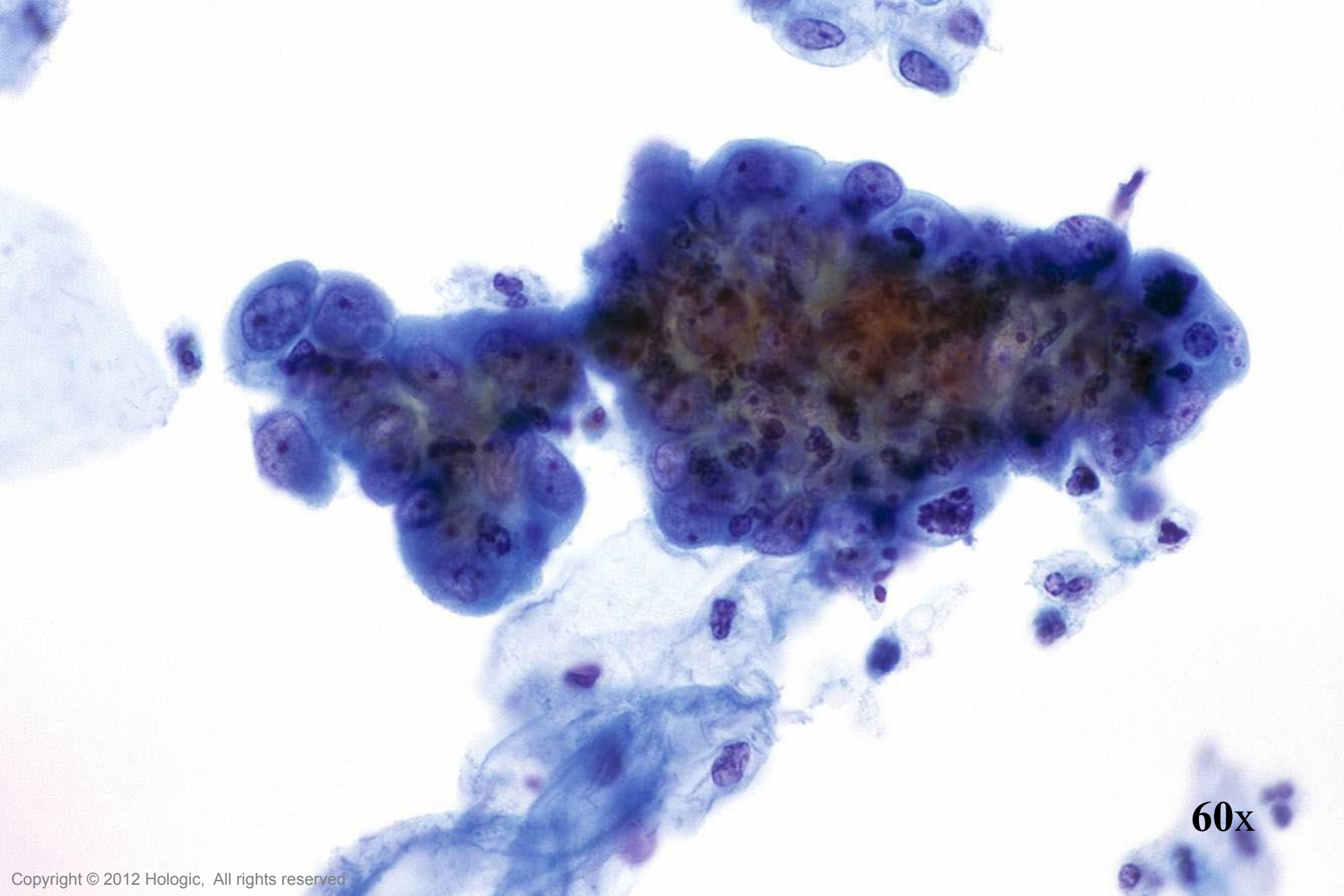
Endocervical Adenocarcinoma

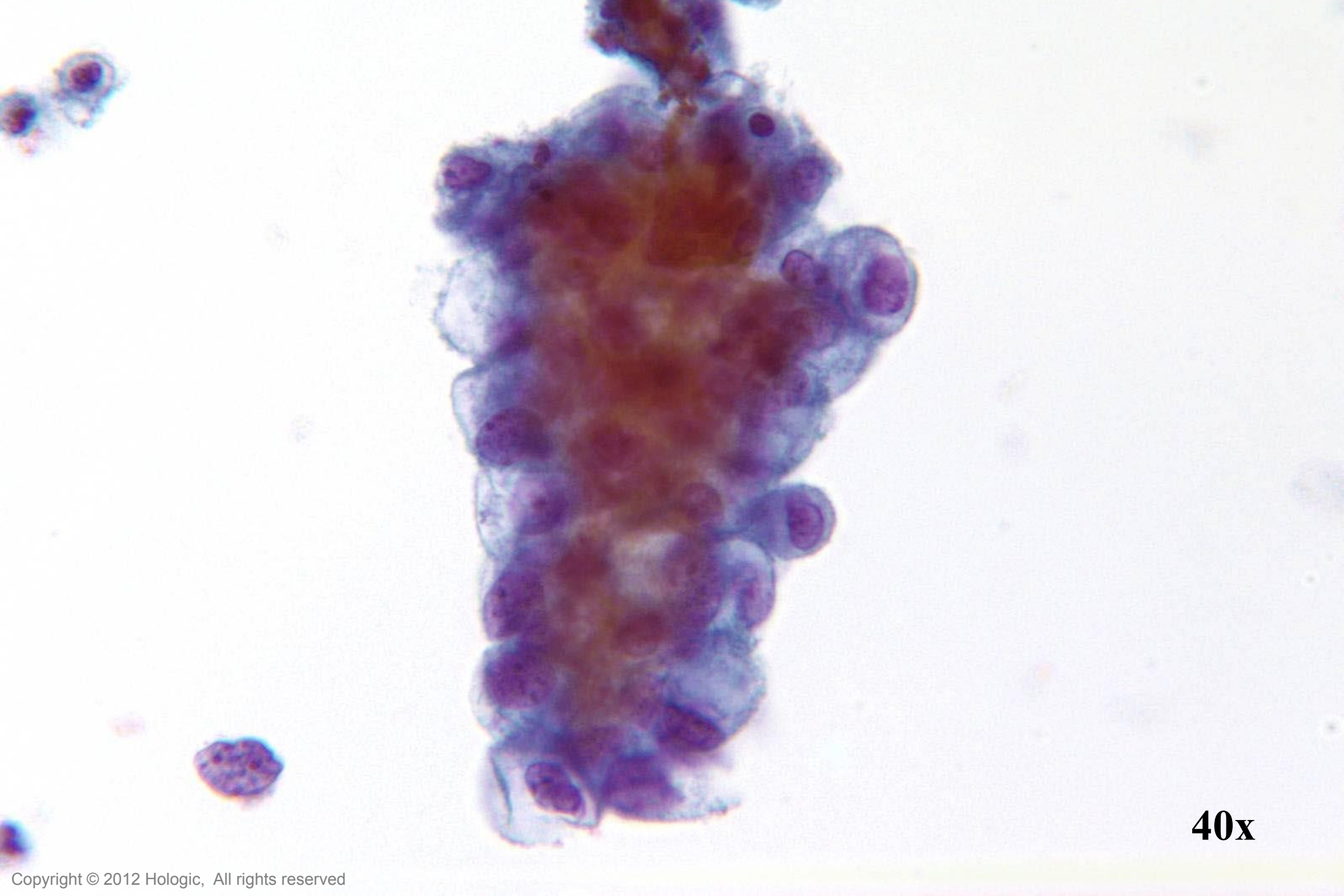
- Abundant abnormal material
  - directly scraped
- Well preserved material
- Cells and cell groupings generally larger in size
- Abundant, foamy cytoplasm, occasionally columnar shaped
- AIS precursor with endocervical architecture may be seen

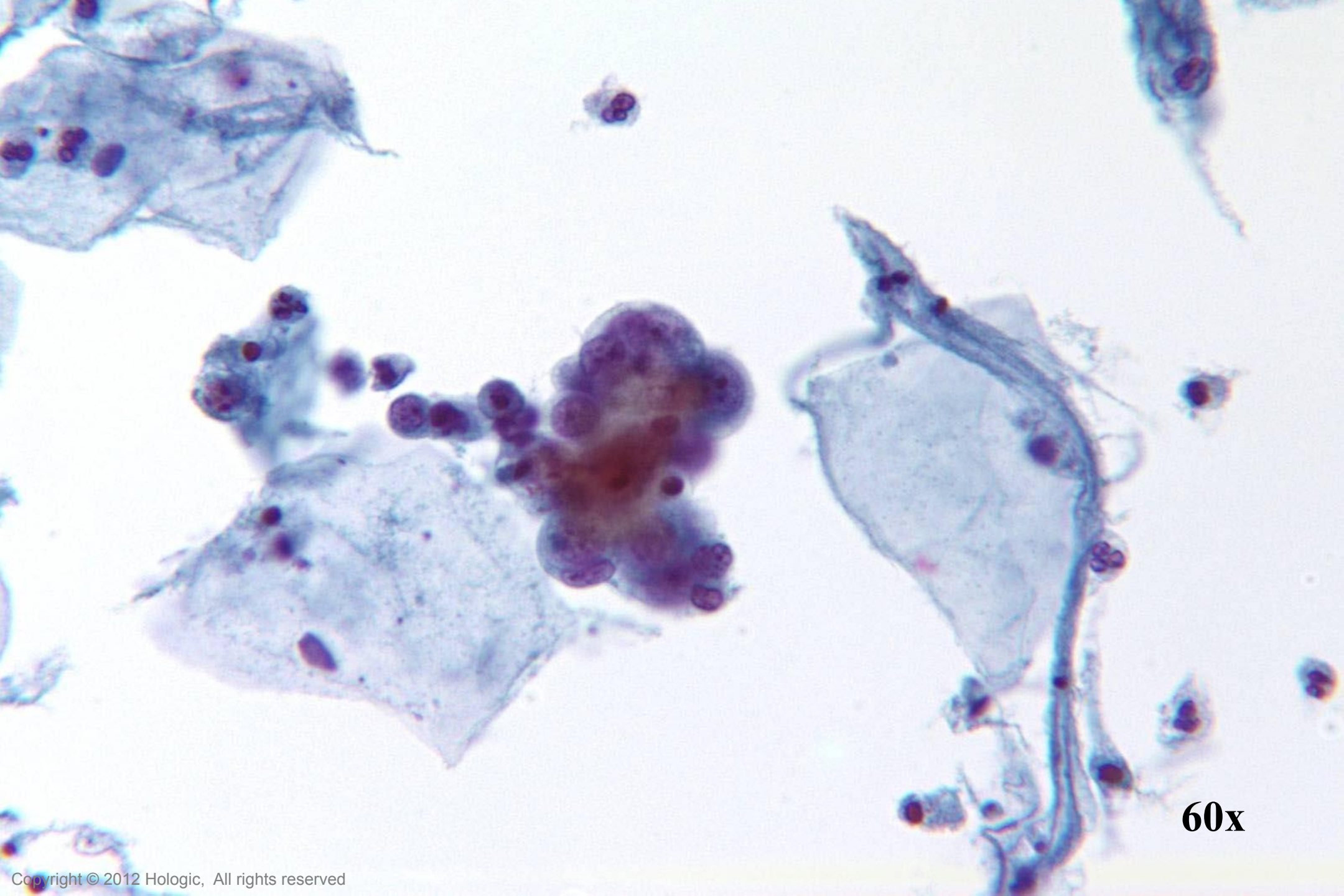
Endometrial Adenocarcinoma

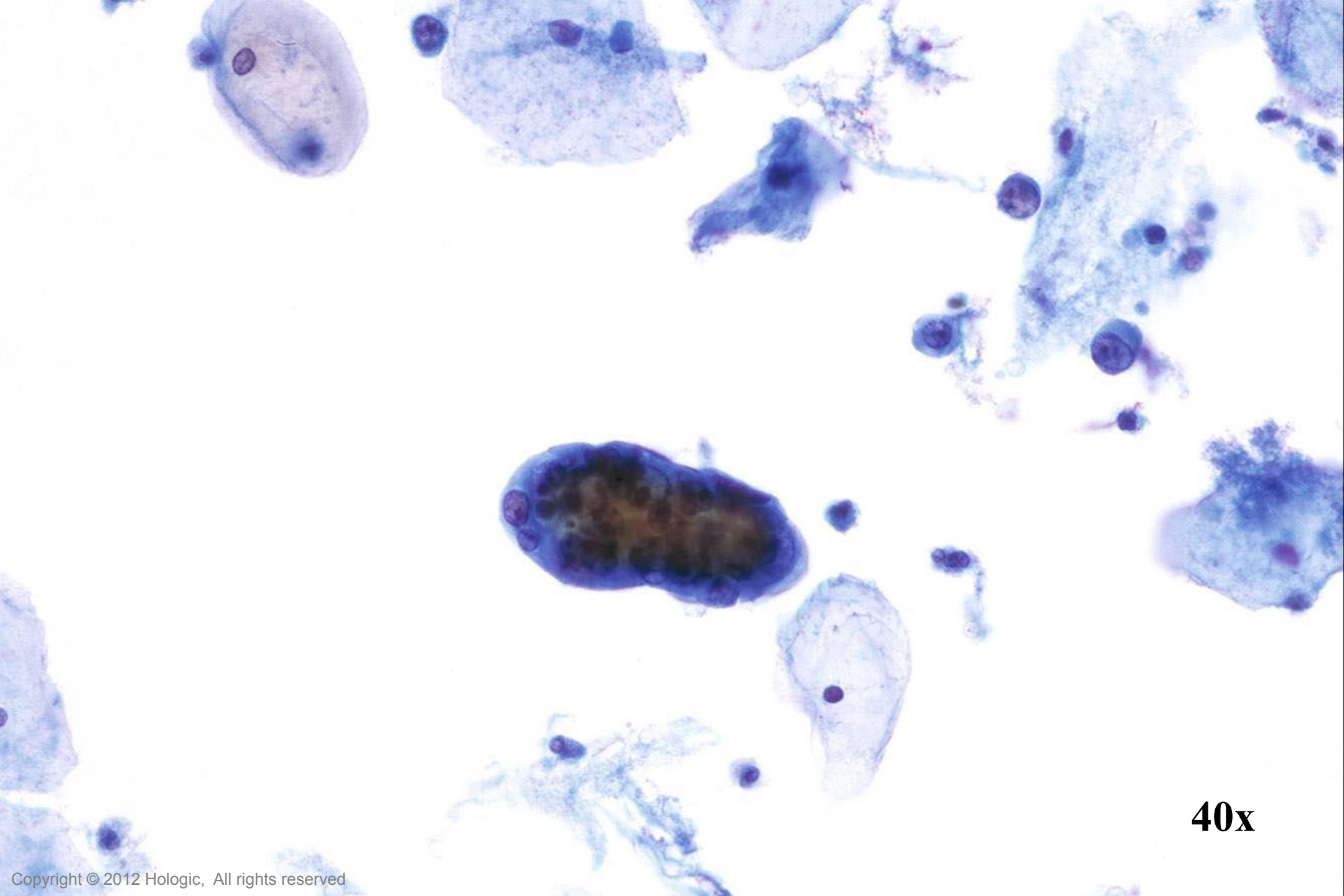
- Isolated abnormal groups
  - cell shedding
- Variable preservation of cells
- Cells and cell groupings generally smaller in size
- Scant, cyanophilic cytoplasm with occasional conspicuous vacuoles
- Mature hormonal pattern, watery transudate may be seen











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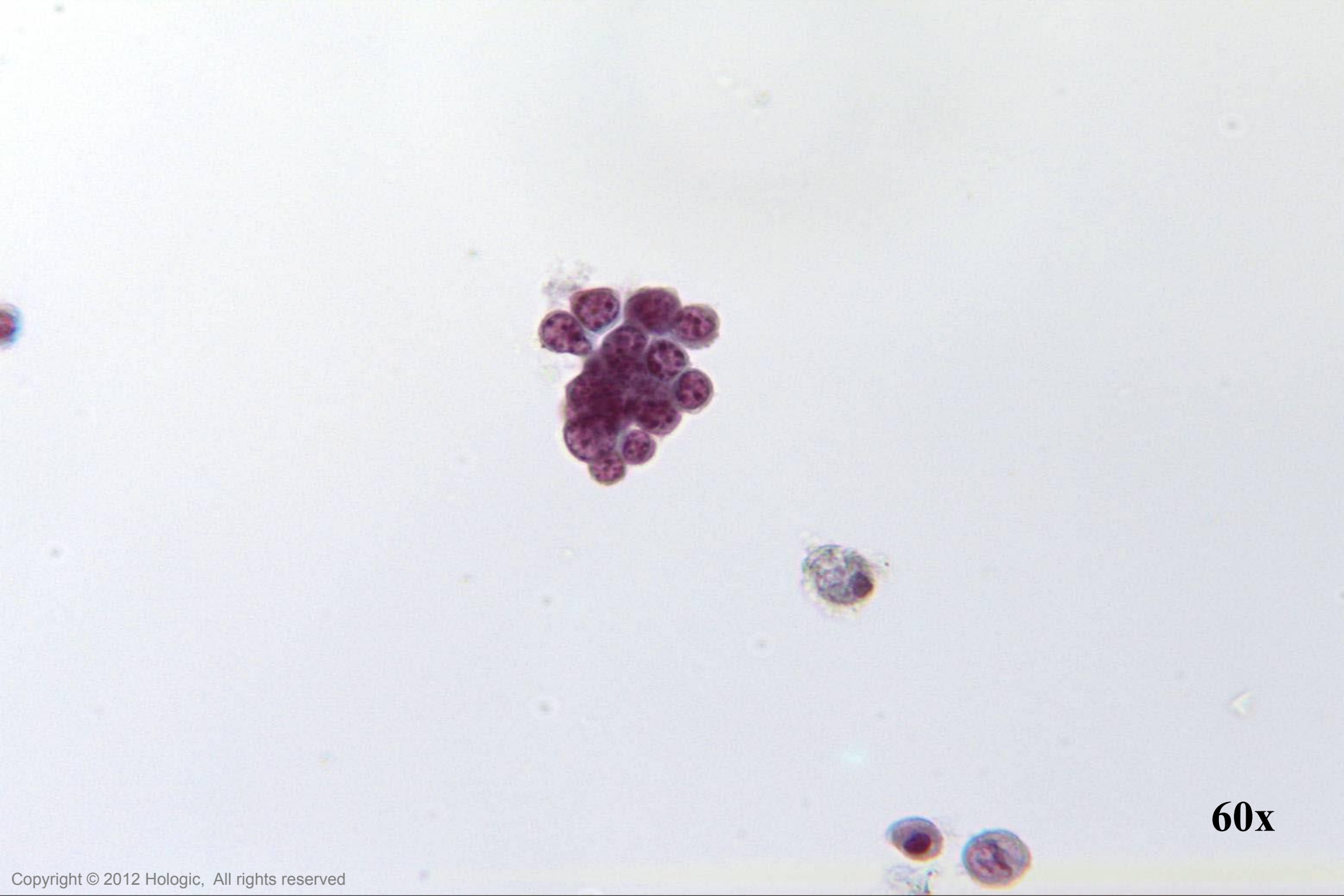
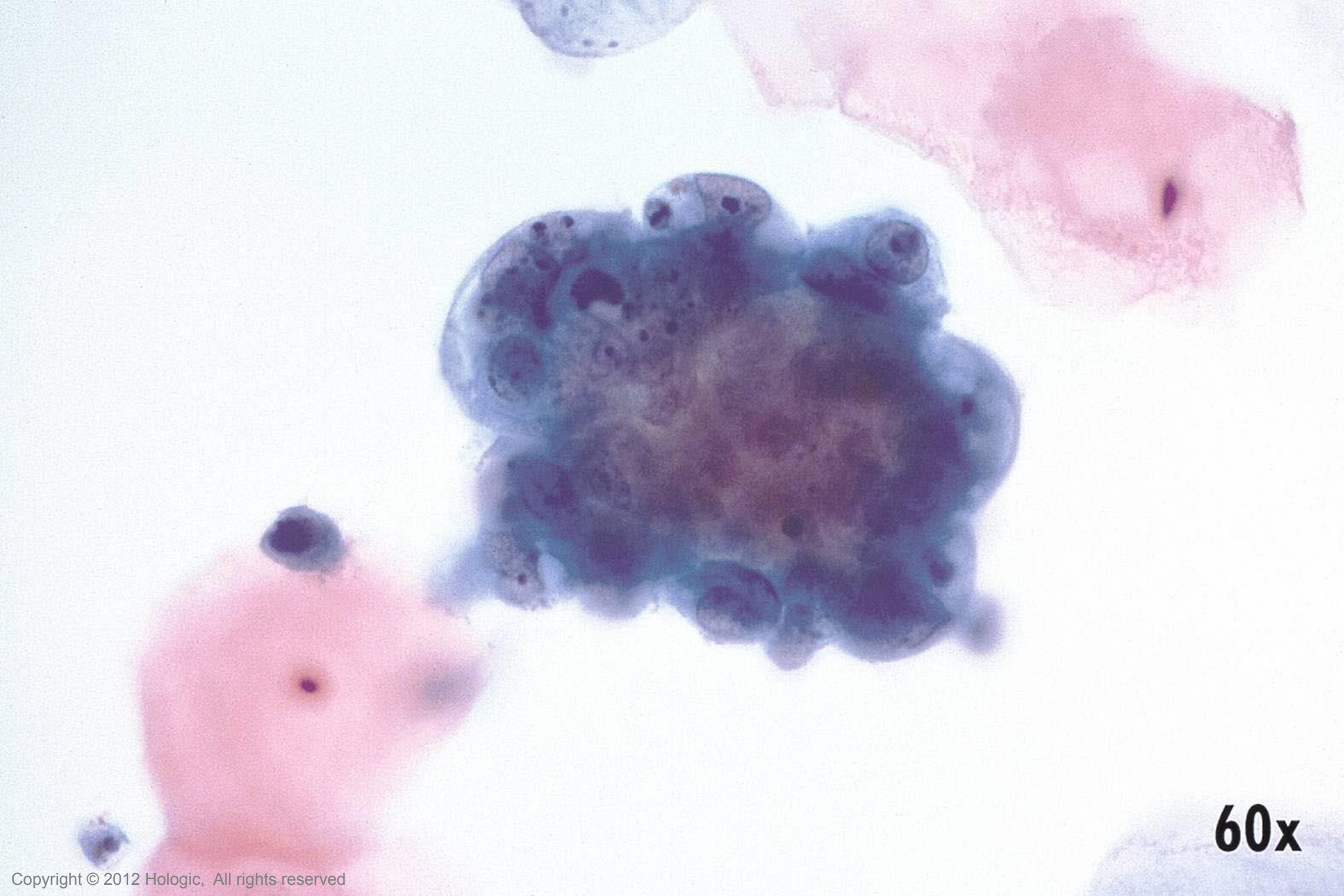
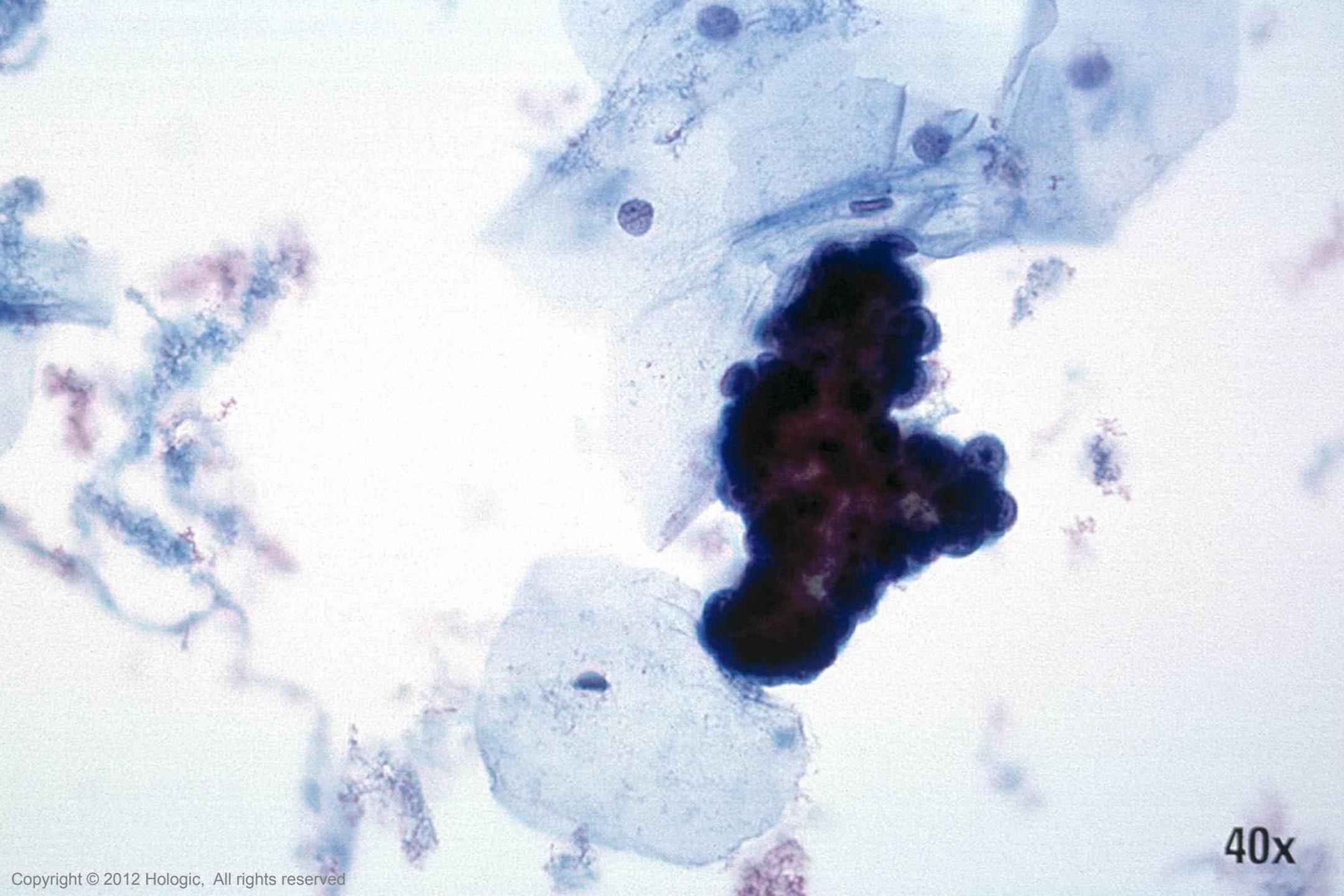
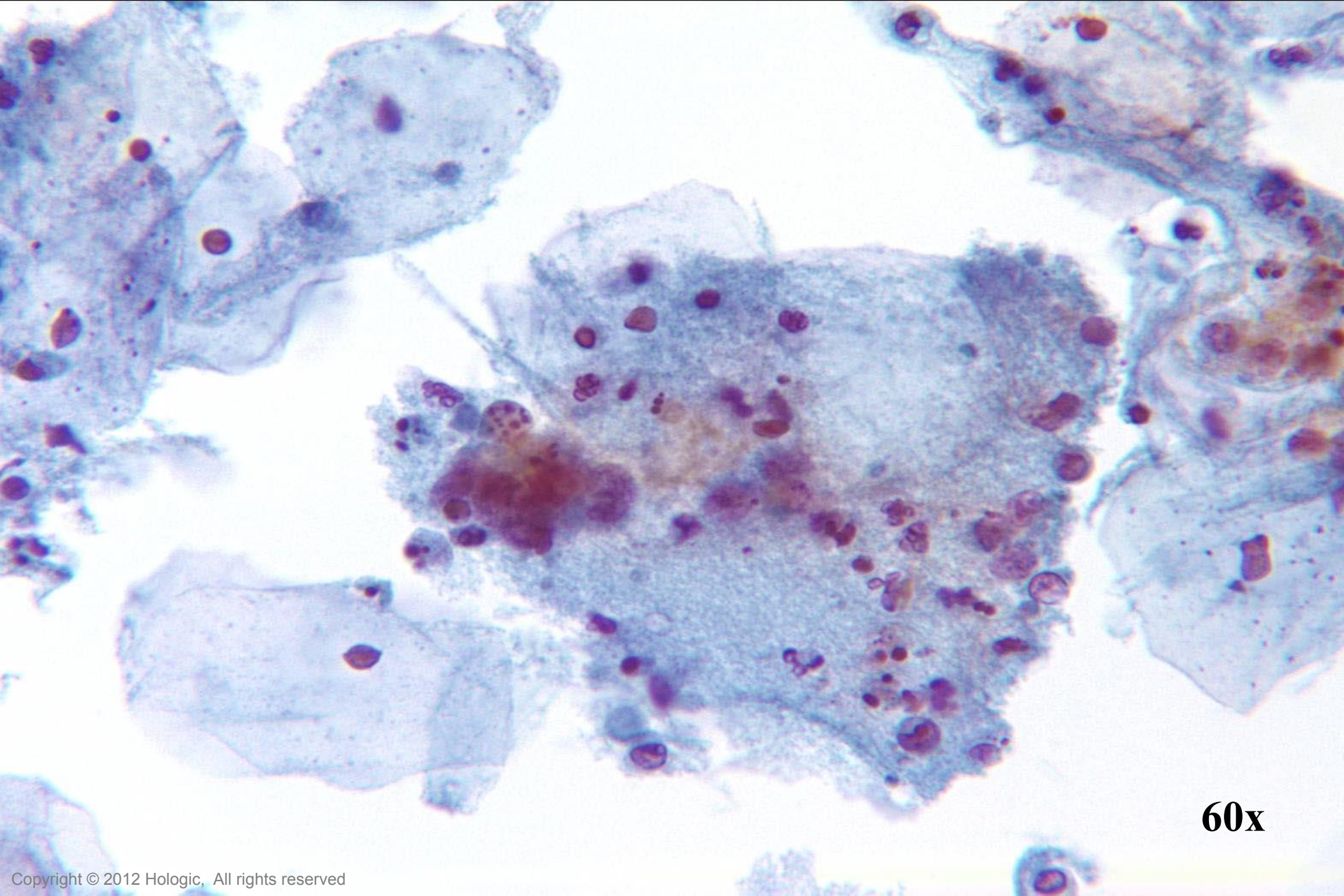
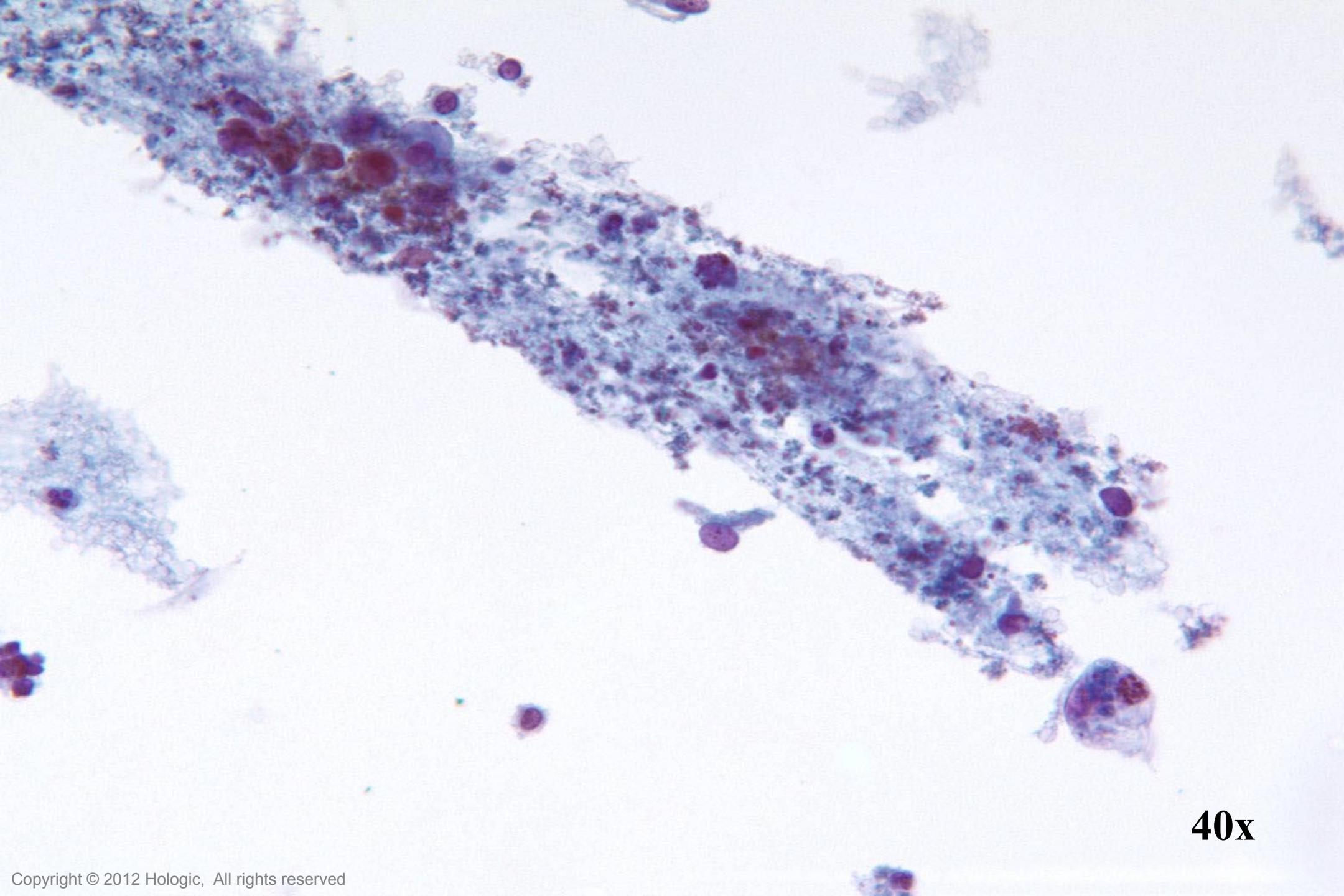










Endometrial Adenocarcinoma vs. Small Cell SCC

Endometrial Adenocarcinoma

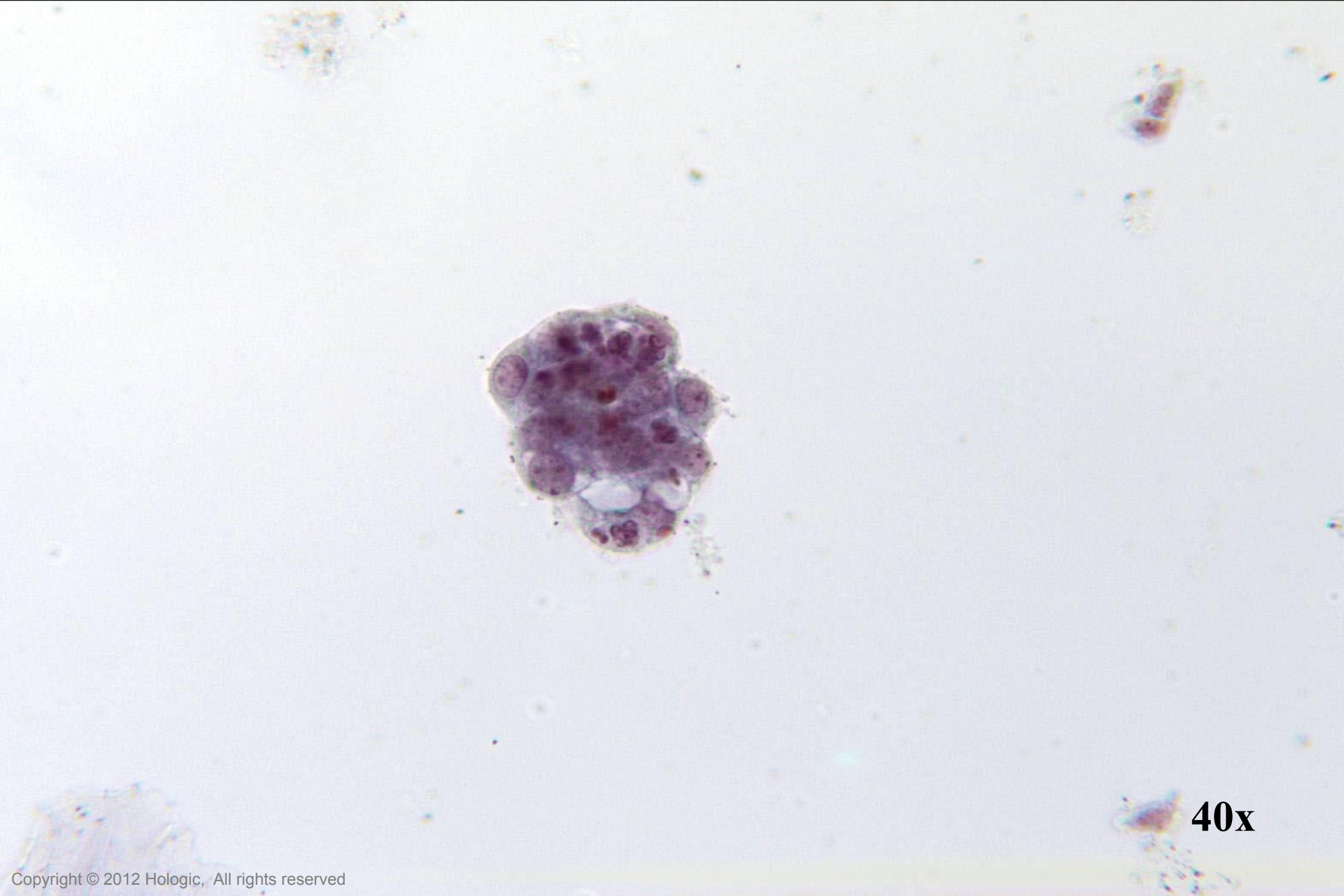
- Isolated abnormal groups
  - cell shedding
- Occasional clusters, fewer single cells
- Scant, vacuolated cytoplasm
- Eccentrically located nuclei
- Parachromatin clearing
- Round, central, single or multiple macronucleoli

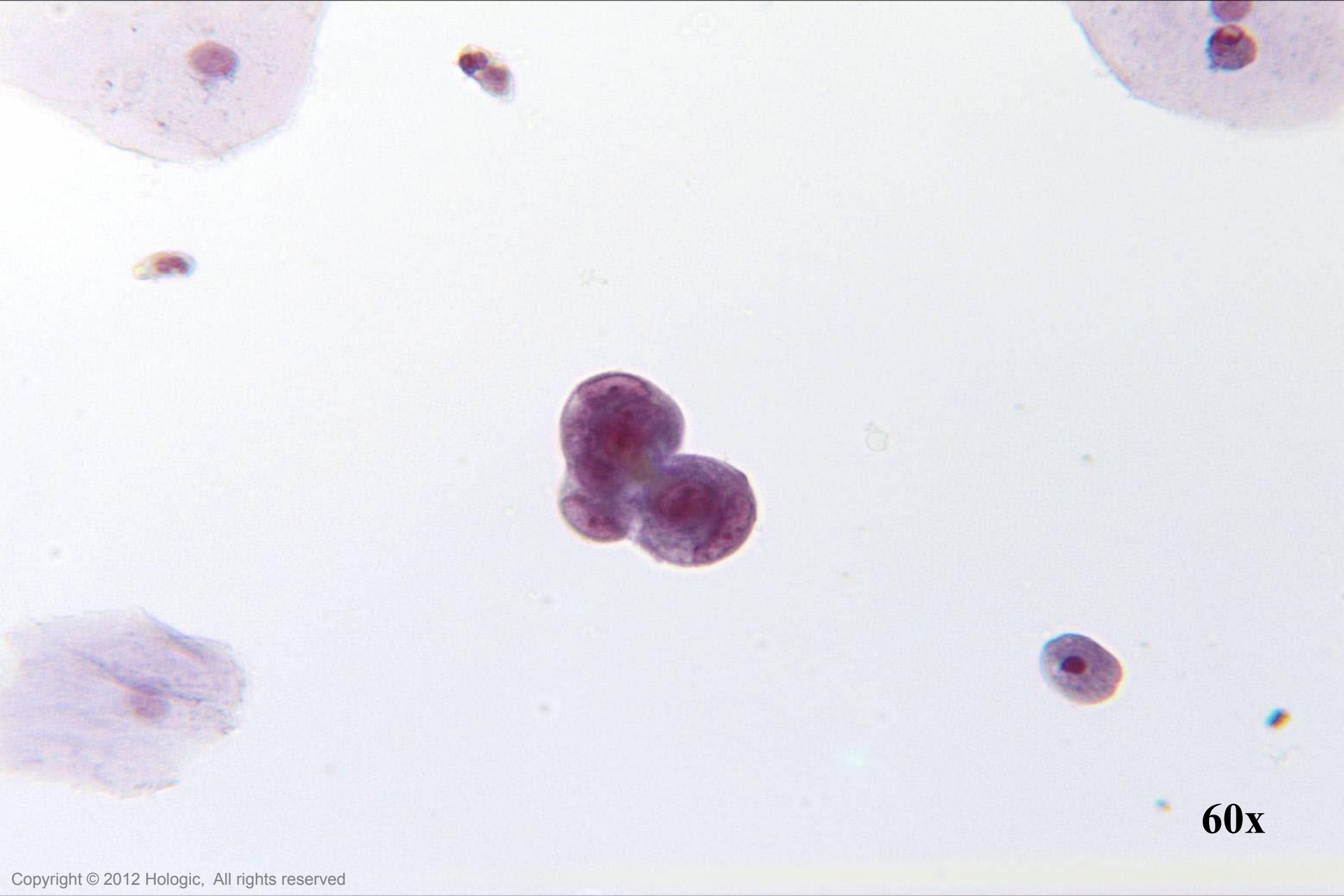
Small Cell SCC

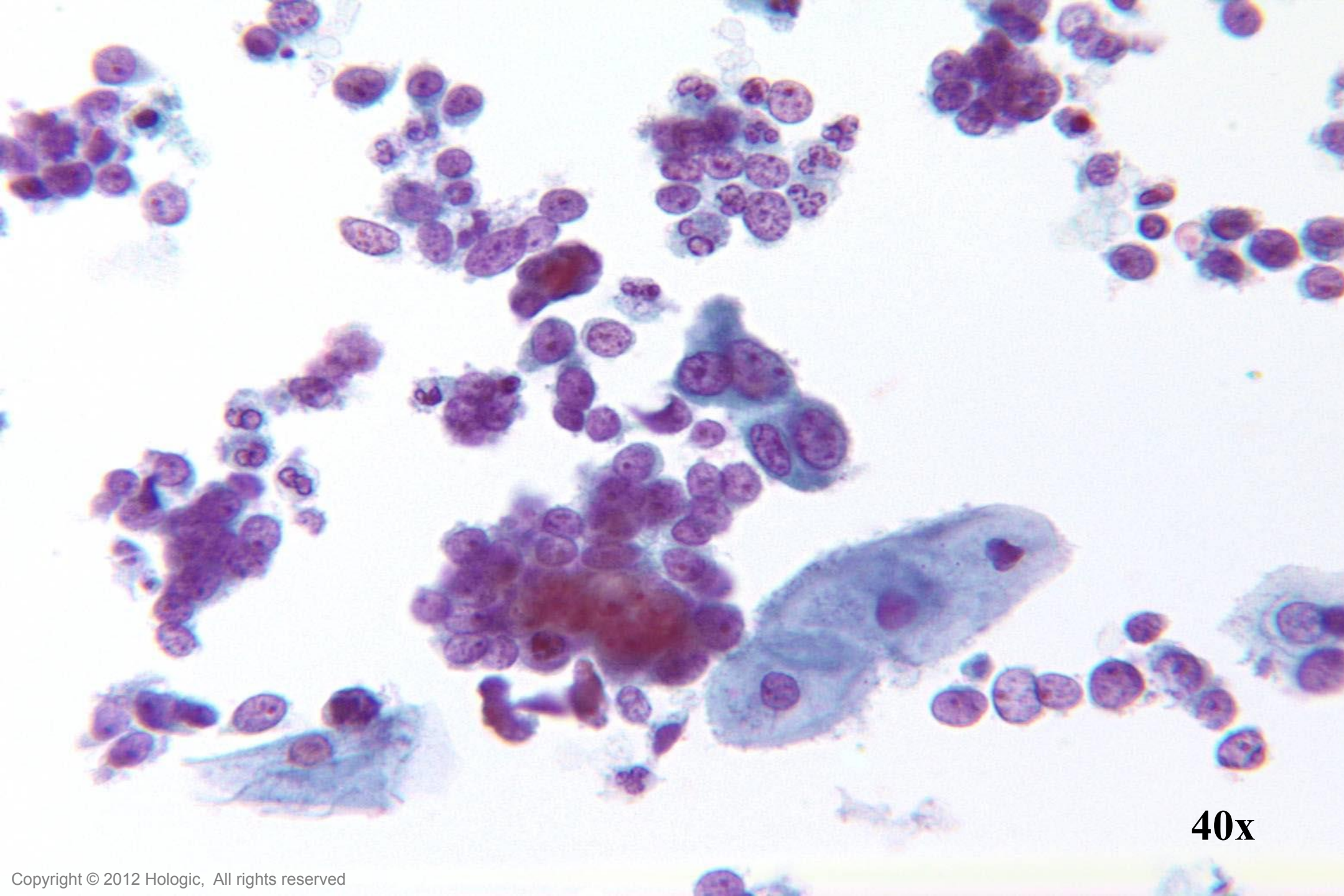
- Abundant abnormal material
  - directly scraped
- ++ Single cells, clusters
- Dense, homogenous cytoplasm

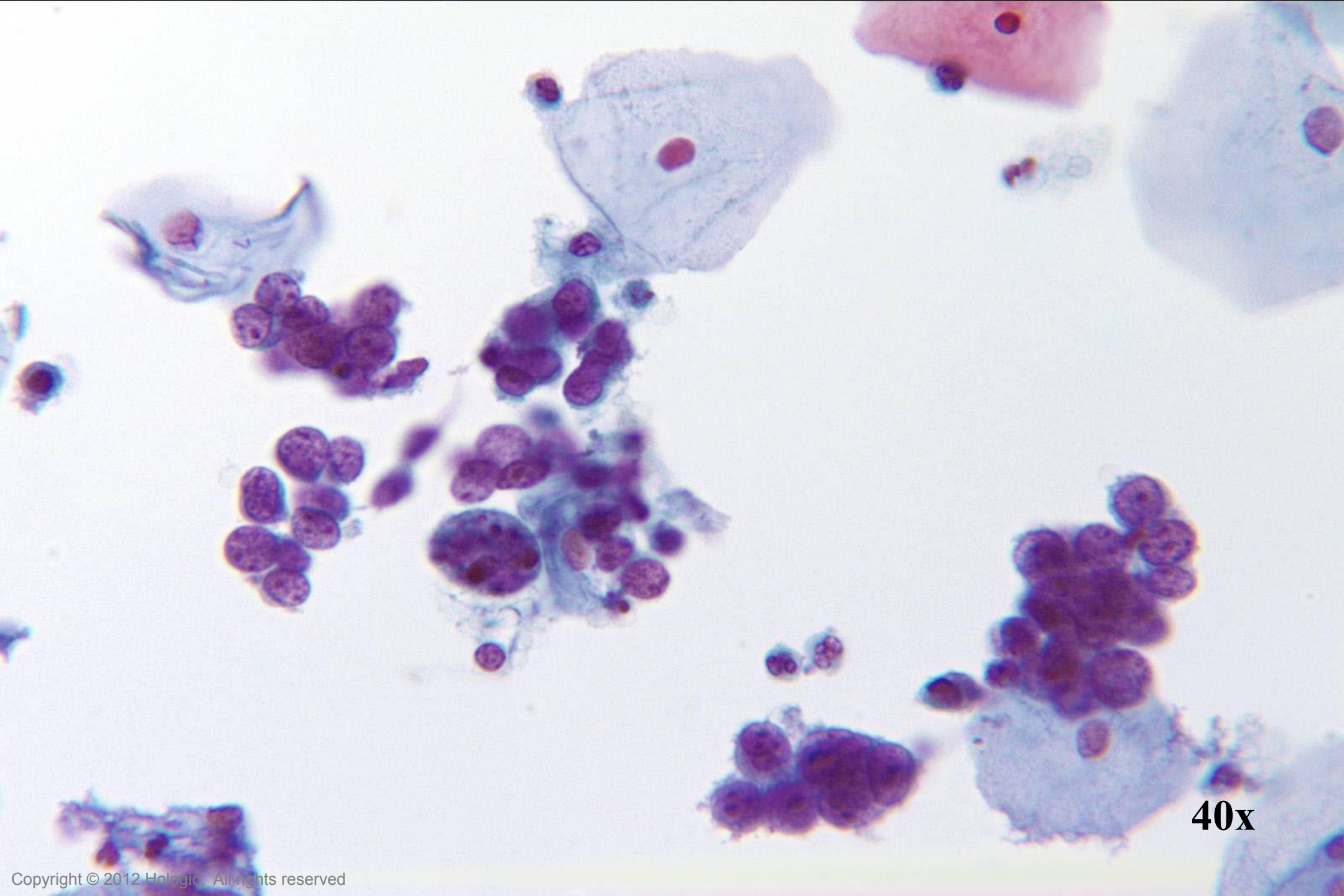
Centrally located nuclei

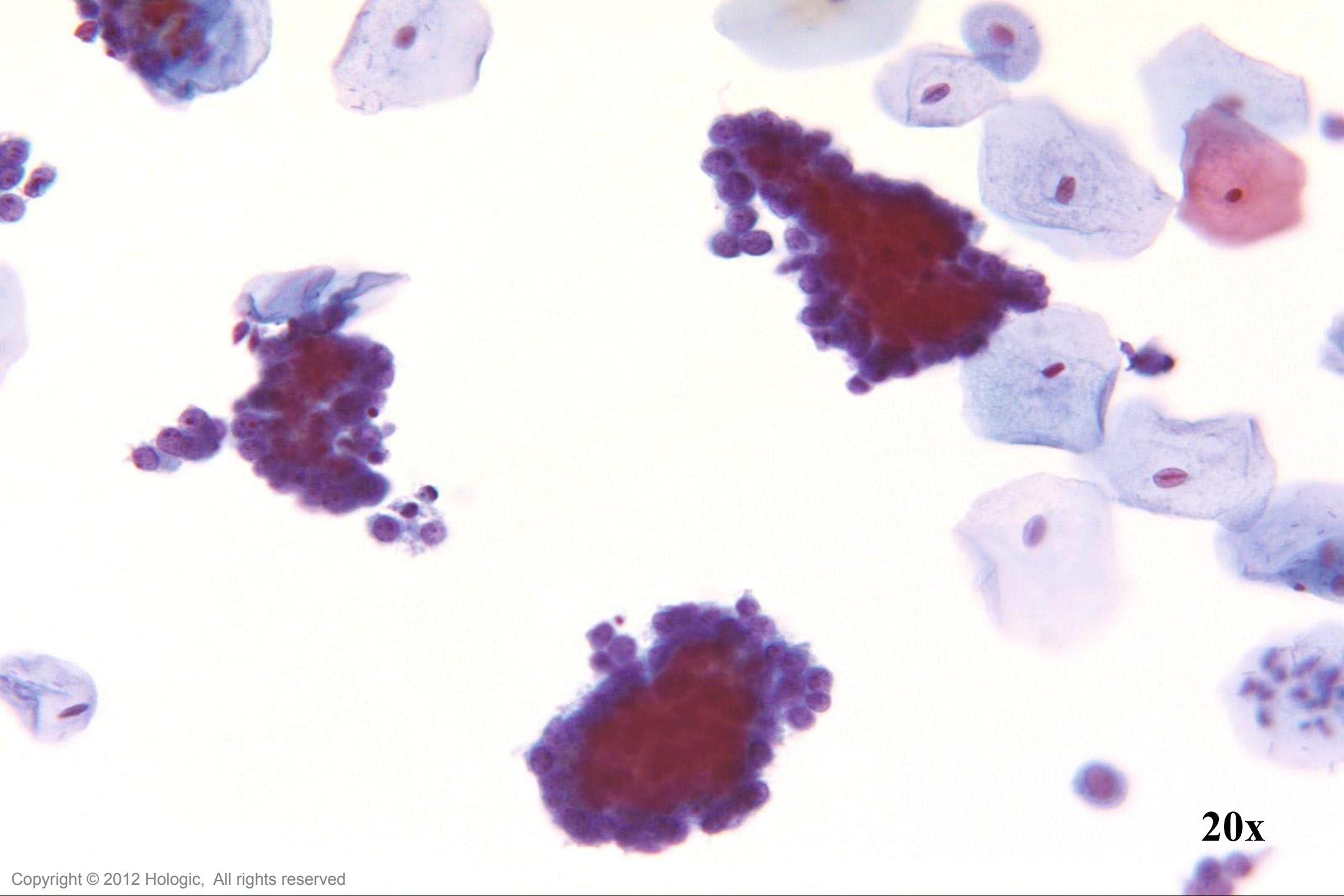
- Irregular chromatin clumping
- Prominent, irregular nucleoli











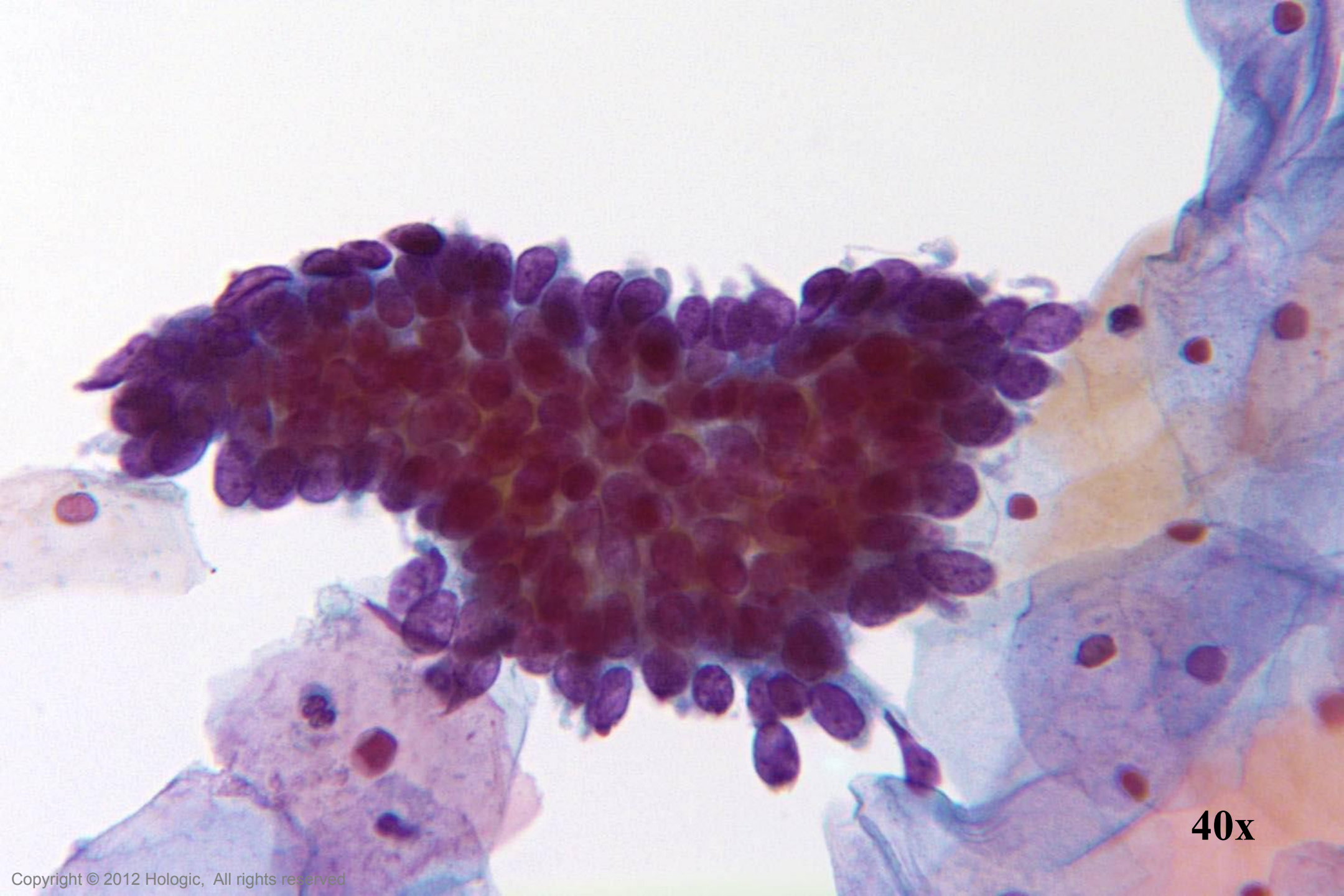
Adenocarcinoma In Situ vs. Tubal Metaplasia

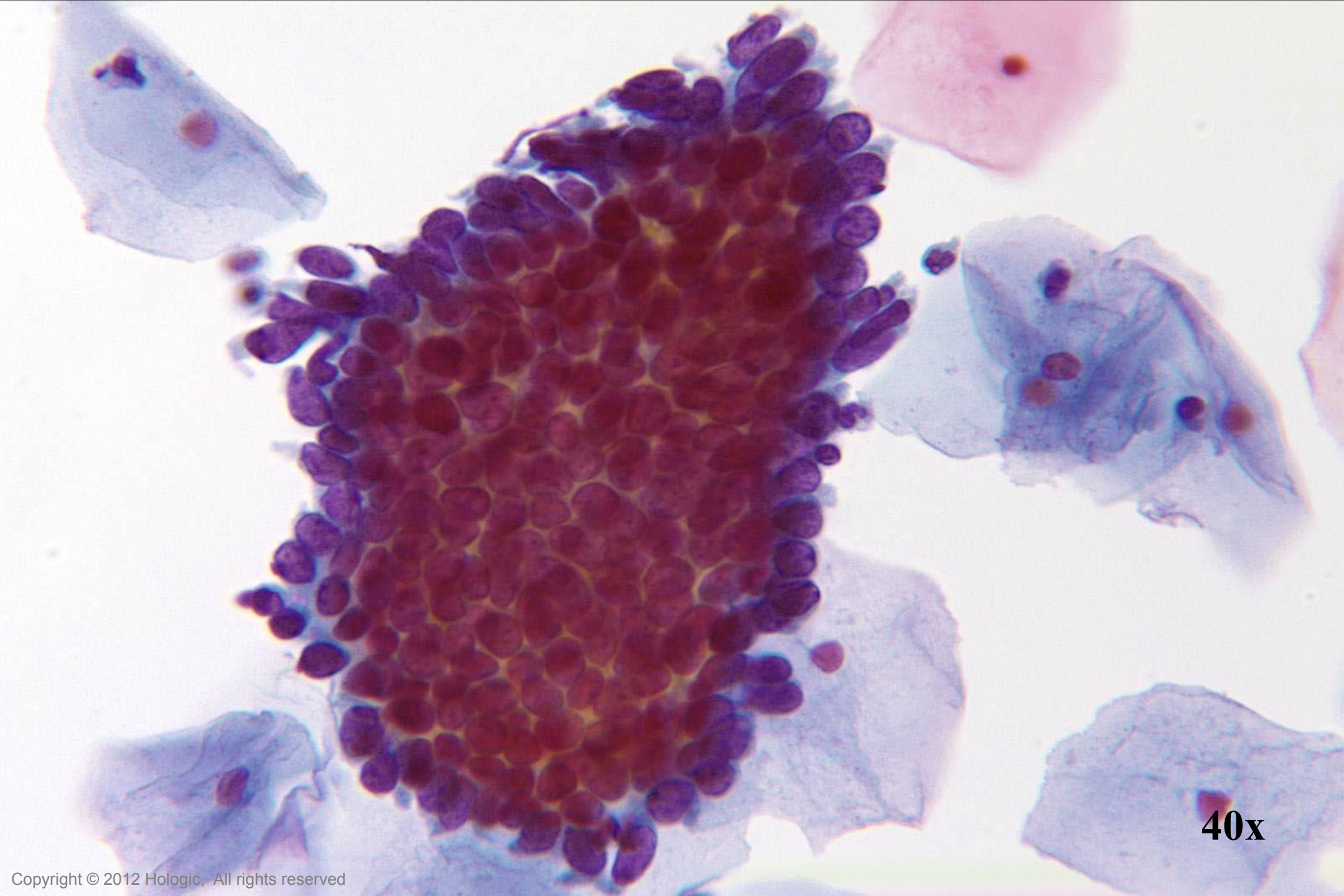
Adenocarcinoma In Situ

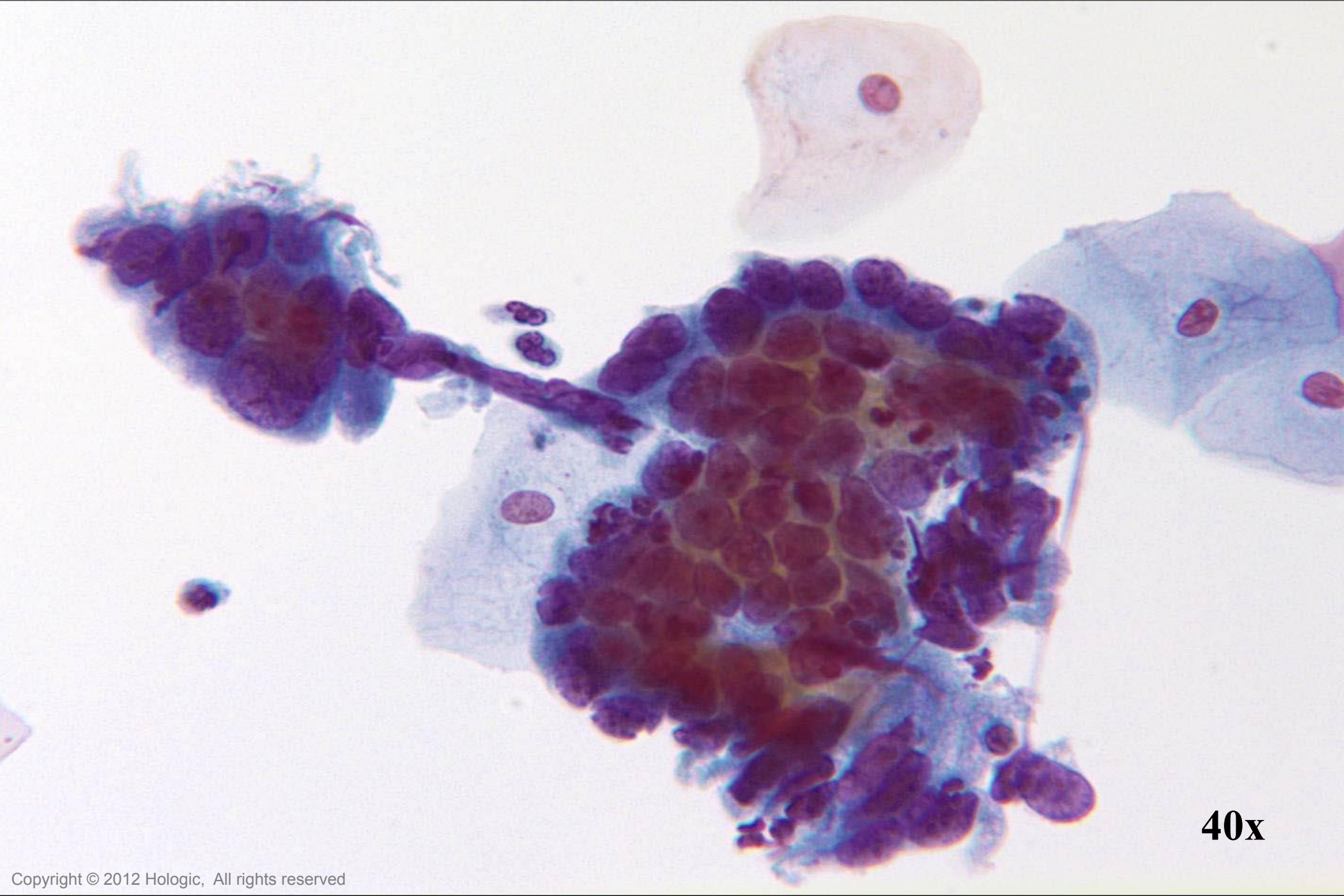
- Crowded sheets & strips
- Feathering & pseudostratification
- Relative hyperchromasia
- Uniformly stippled chromatin
- Nuclear size and shape variation
- Block-like nucleoli
- Mitoses and apoptotic bodies

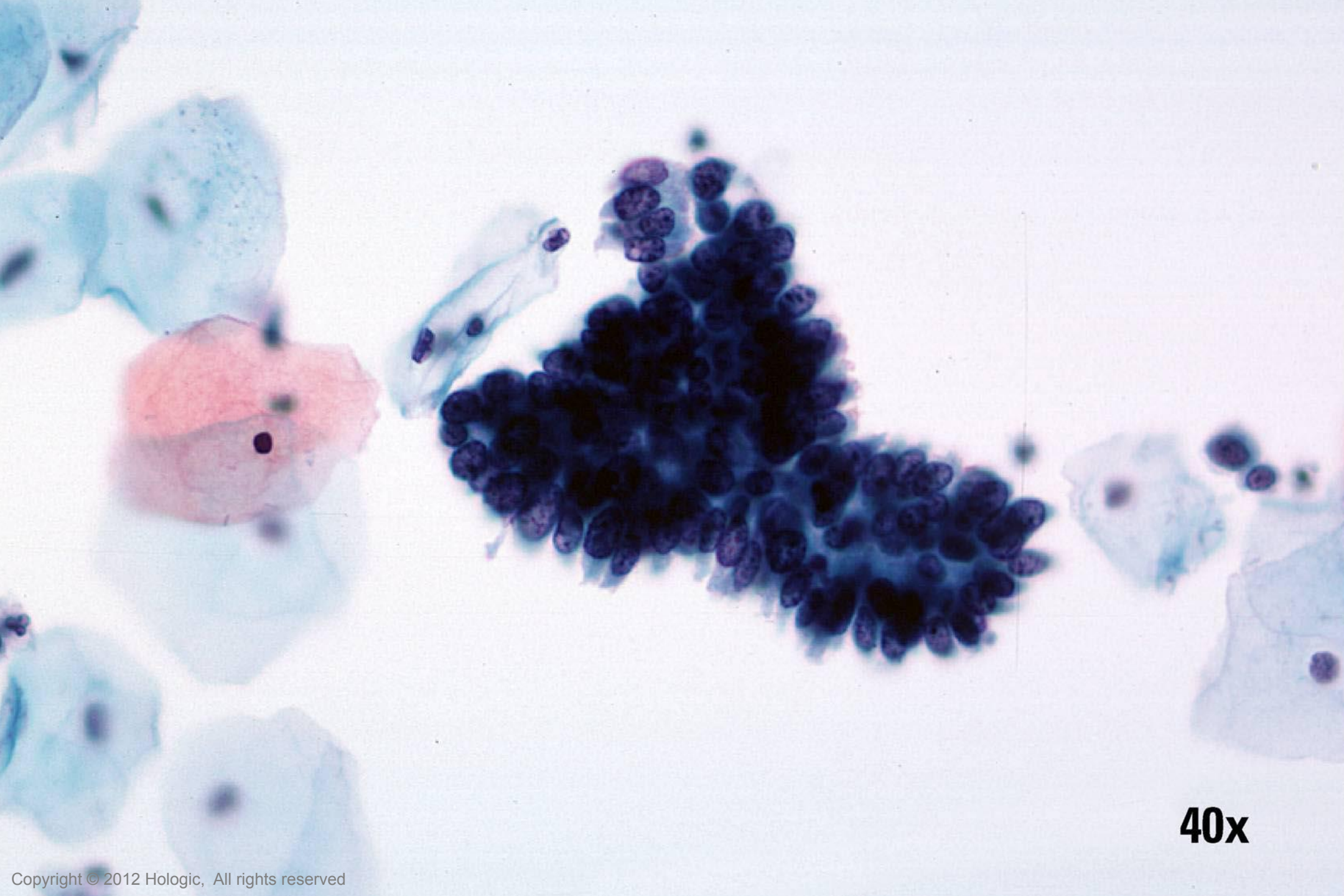
Tubal Metaplasia

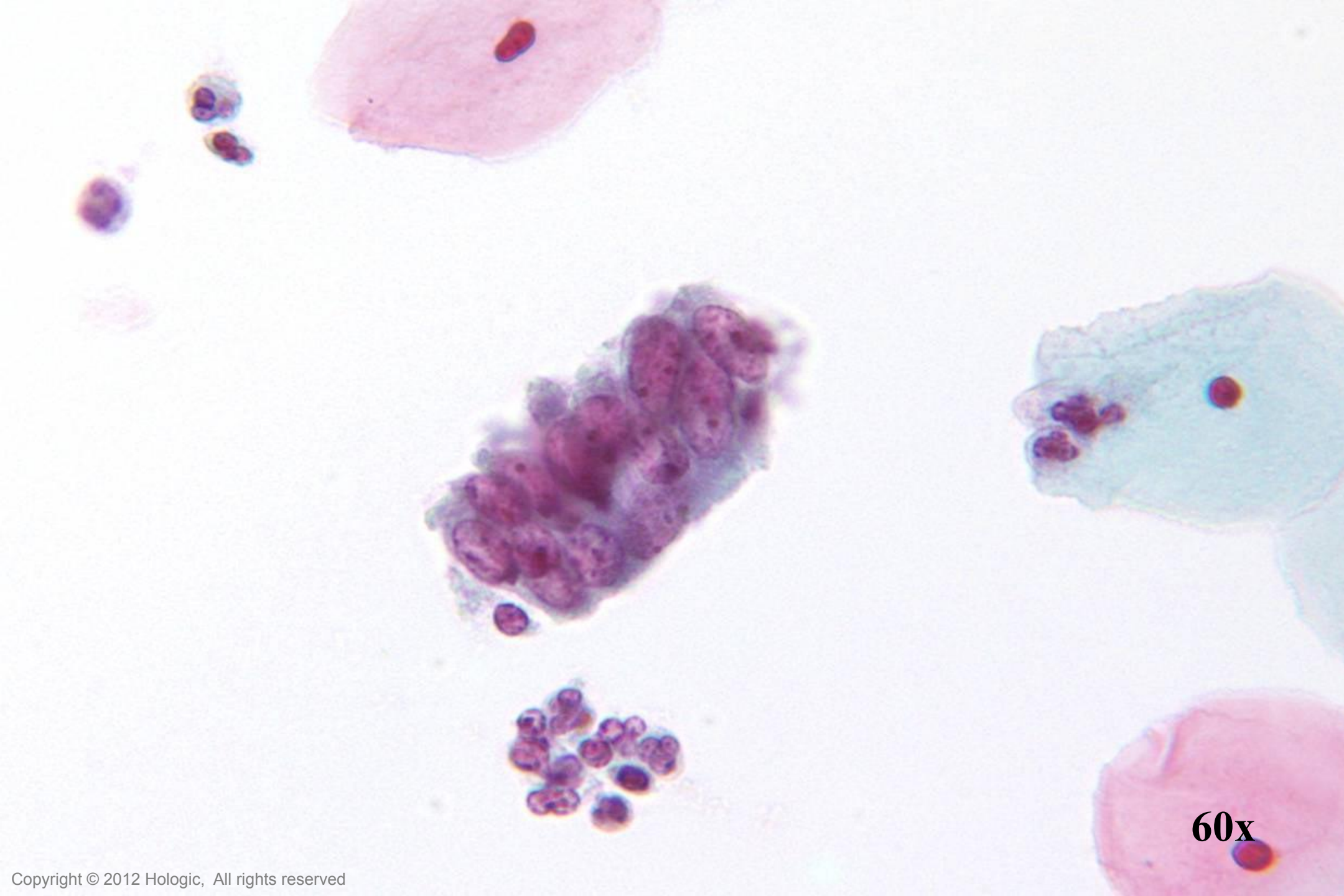
- Cilia and/or terminal bars reliably identified
- Crowding without overlap, lacking depth of focus
- Evenly distributed chromatin
- Cytoplasm dense and cuboidal
- Nucleoli absent
- Nuclear membrane irregularities and thickening absent
- Occasional elongate nuclear forms

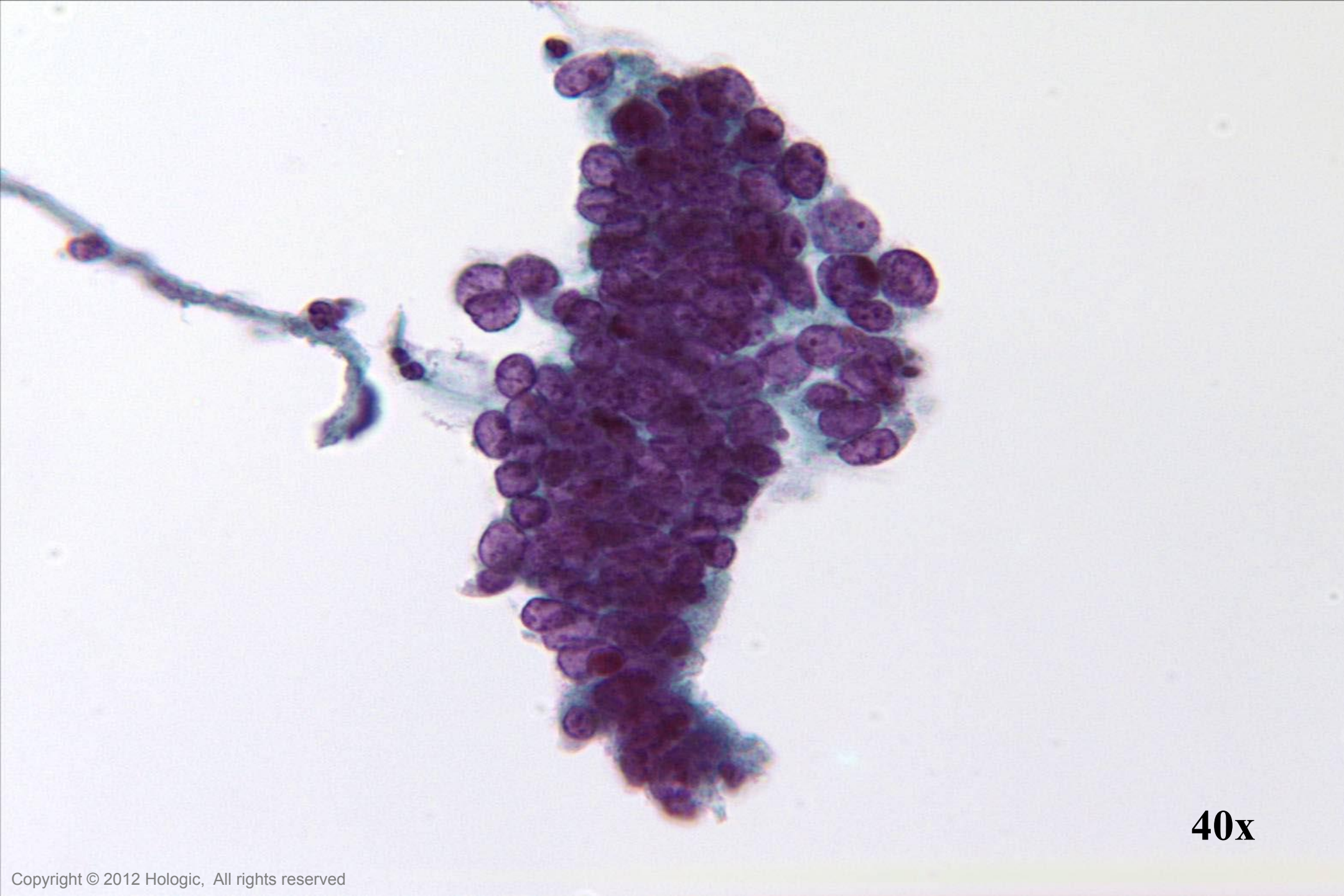


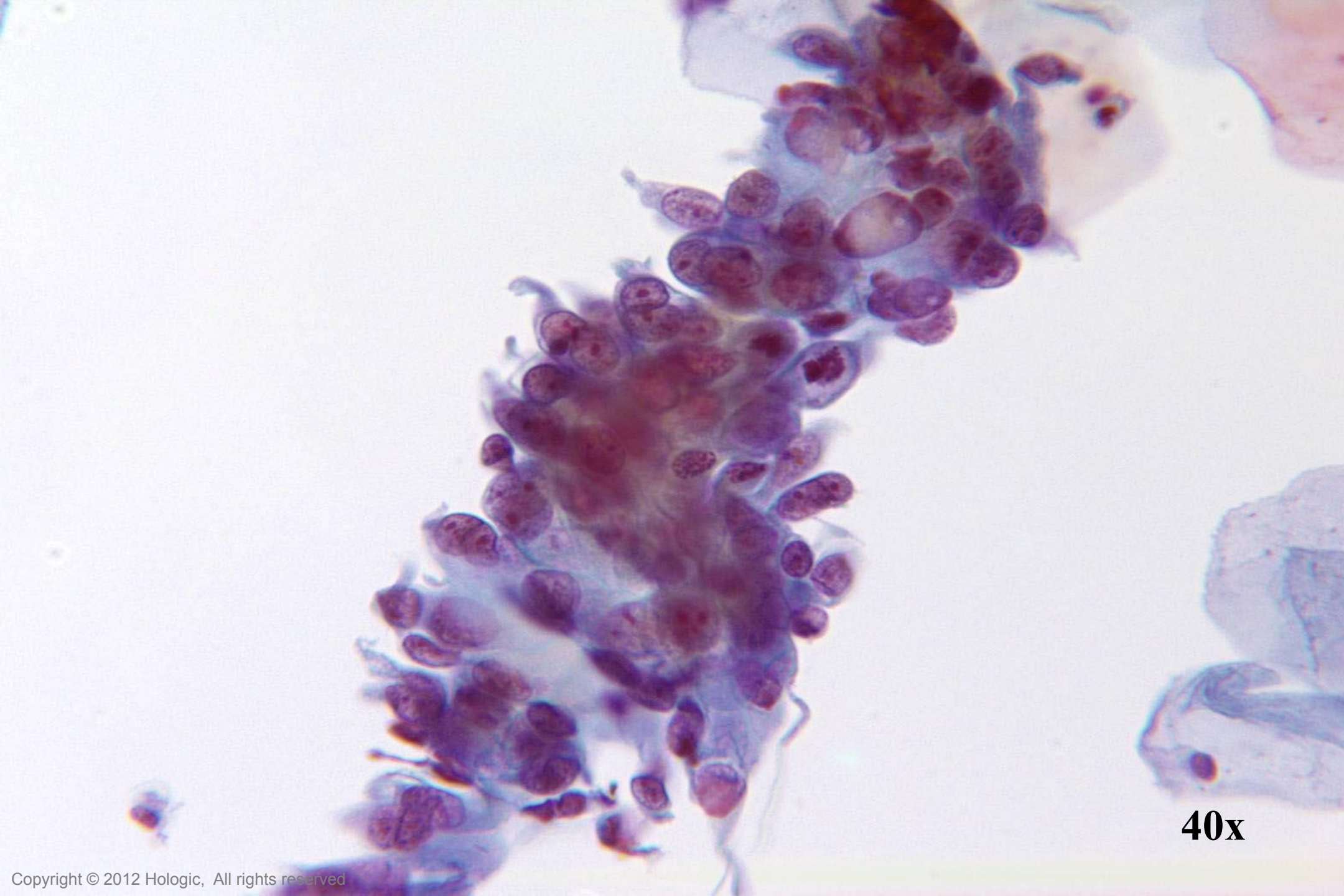


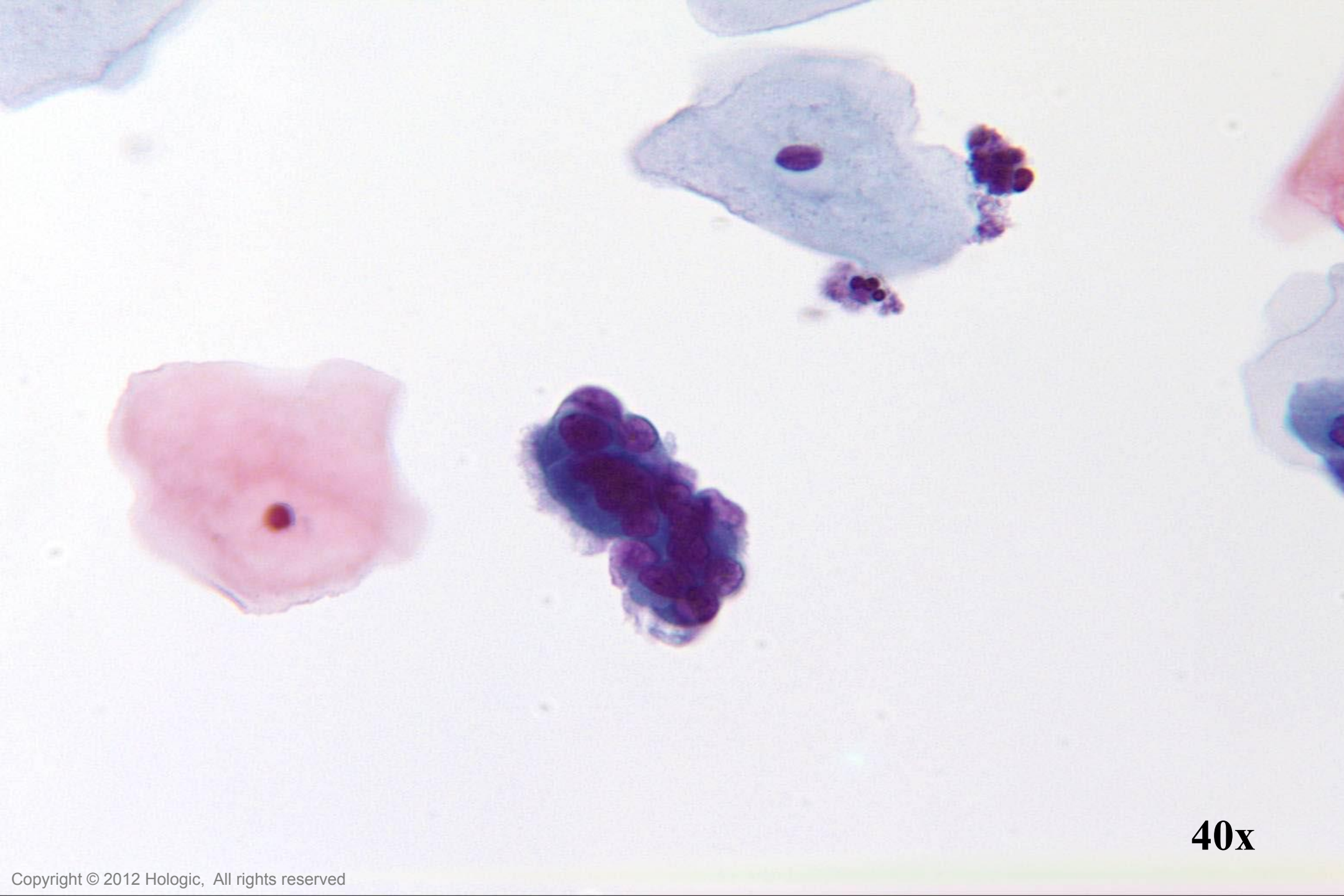












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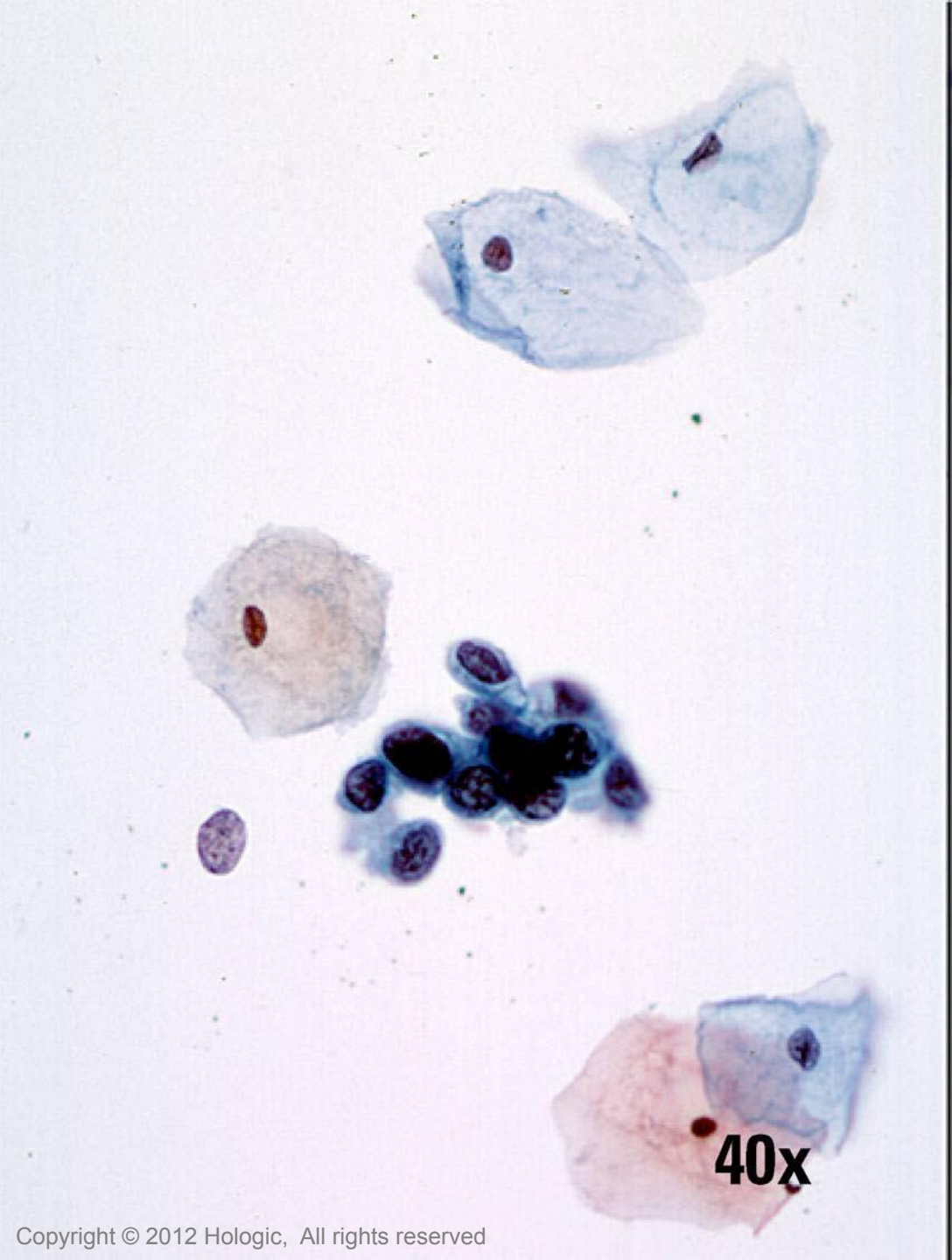
HSIL vs. Endometrial Cells

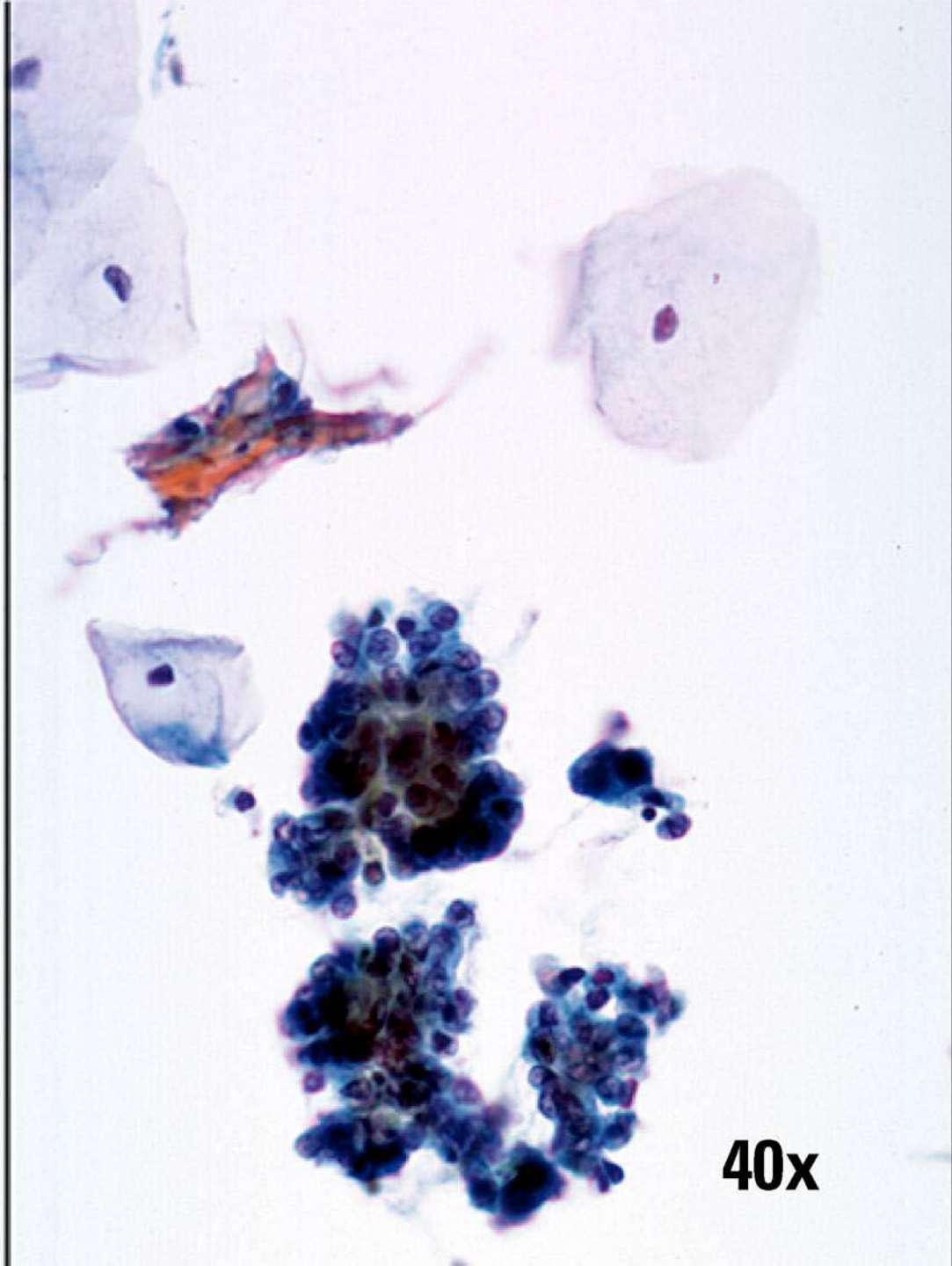
HSIL

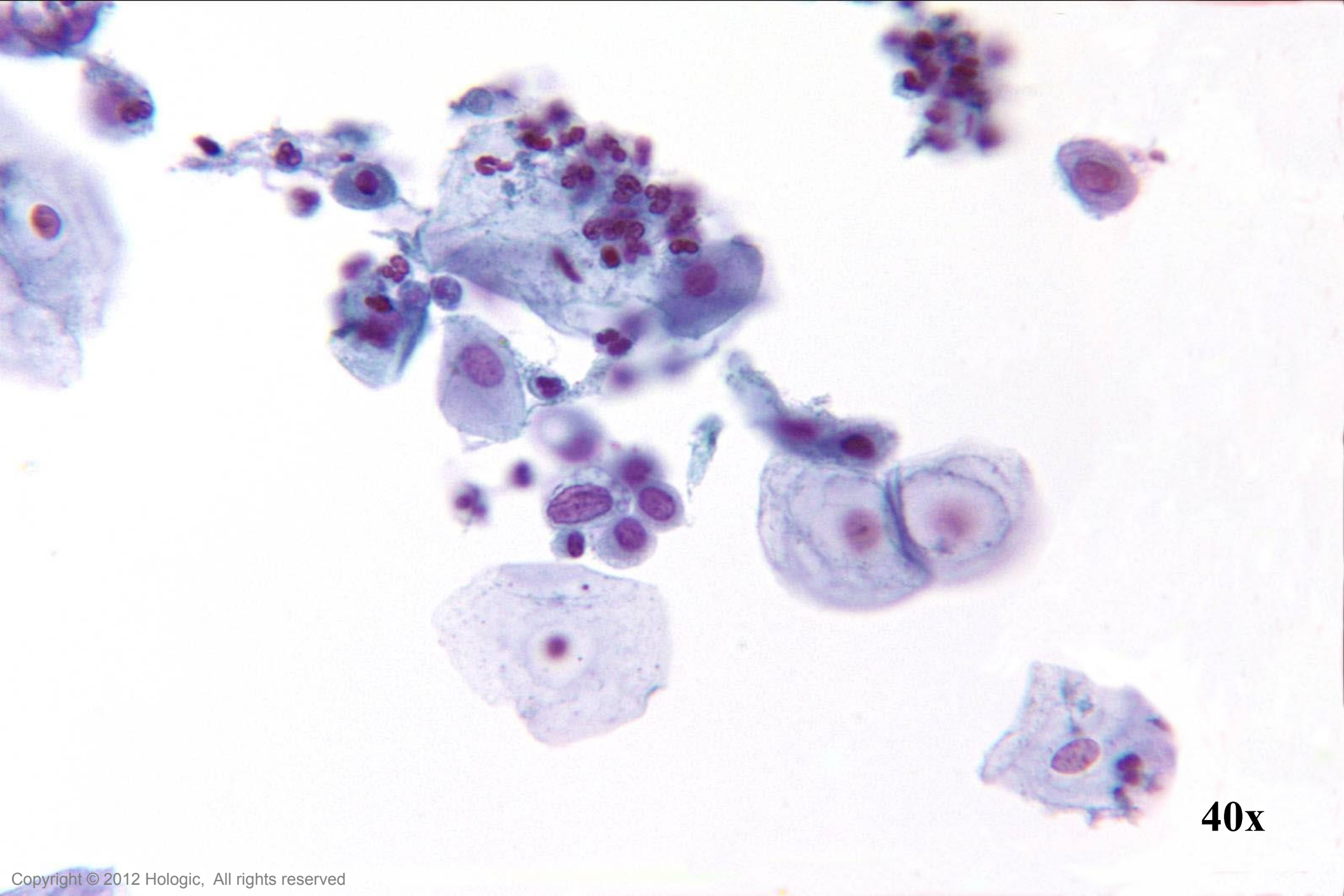
- Sheets, syncitia; thick plaques rather than 3D ball-like clusters
- Hyperchromasia
- Irregular nuclear membranes
- Single cells have centrally located nuclei
- Dense homogenous cytoplasm

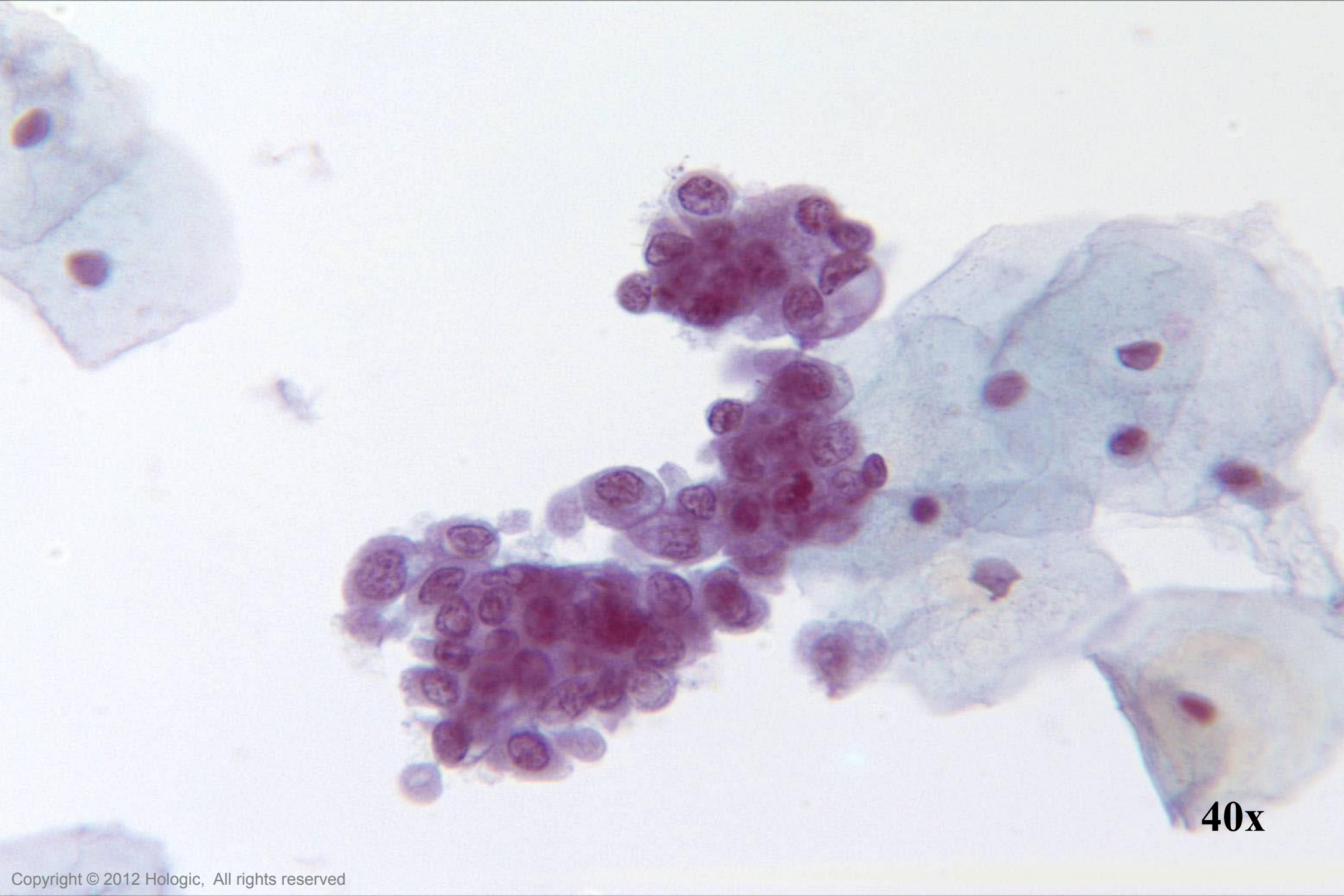
Endometrial Cells

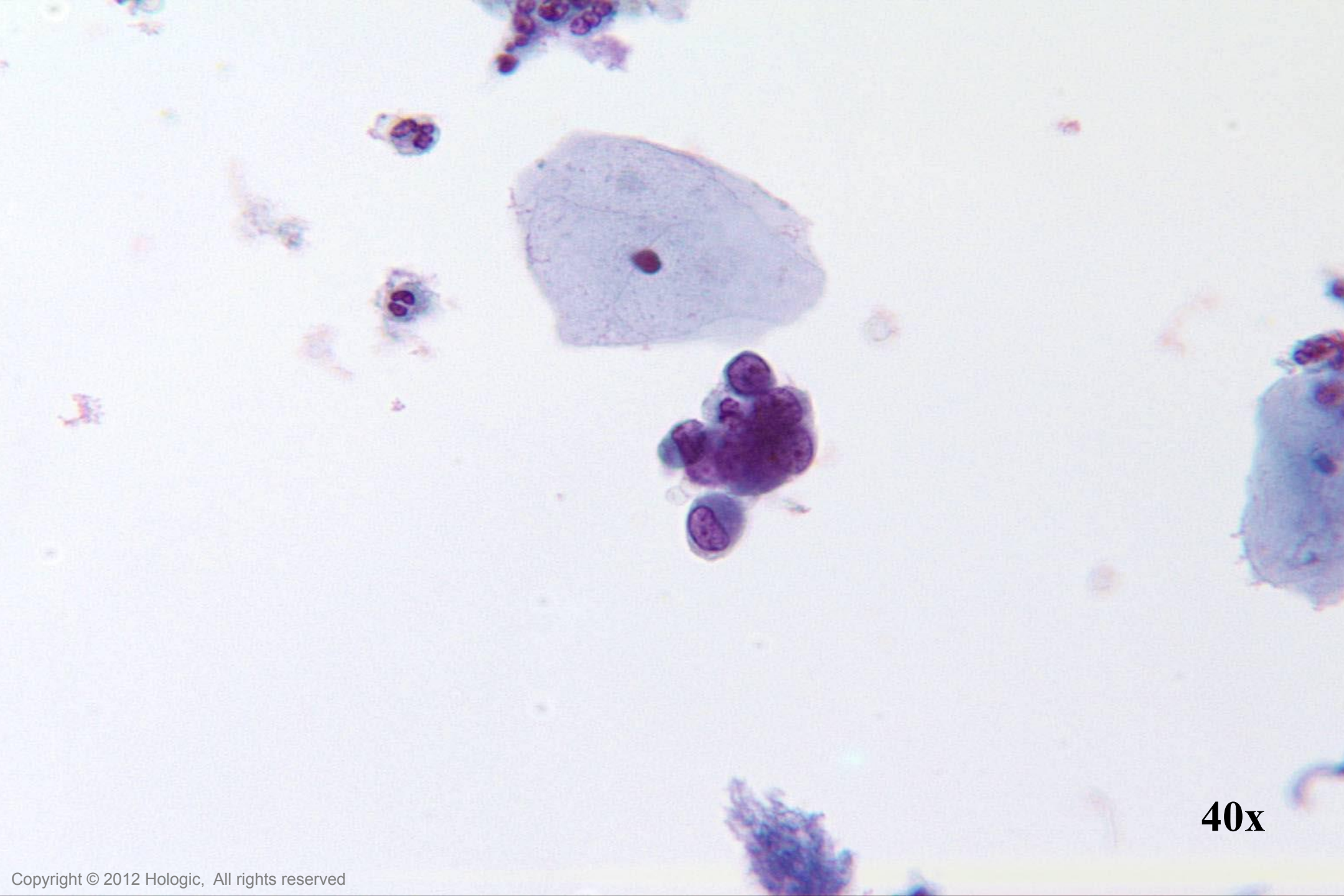
- 3D ball-like clusters and small, single cells
- Relative hyperchromasia
- Regular nuclear membranes
- Single cells with eccentrically located nuclei
- Scant basophilic cytoplasm with cytoplasmic “blebs”

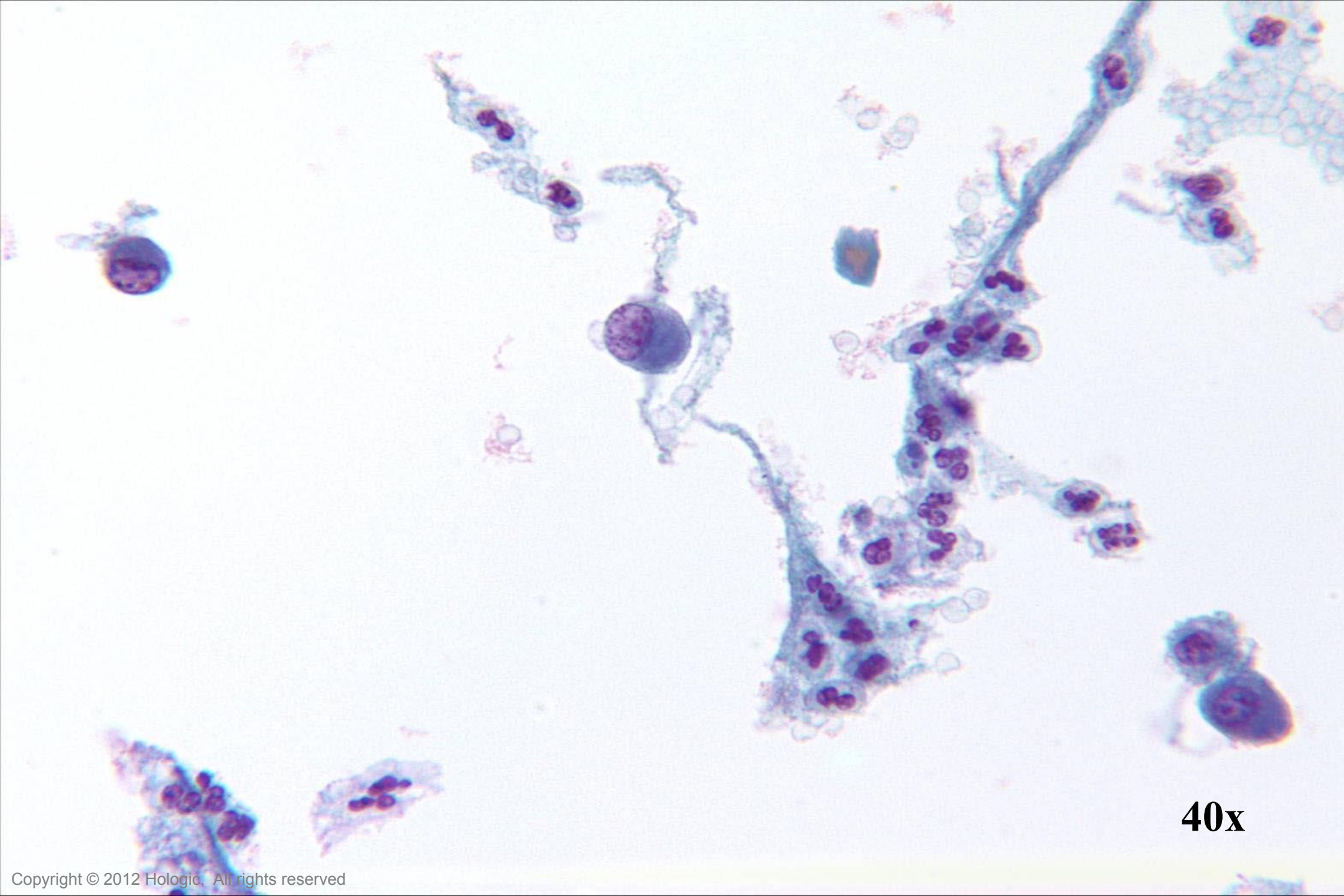


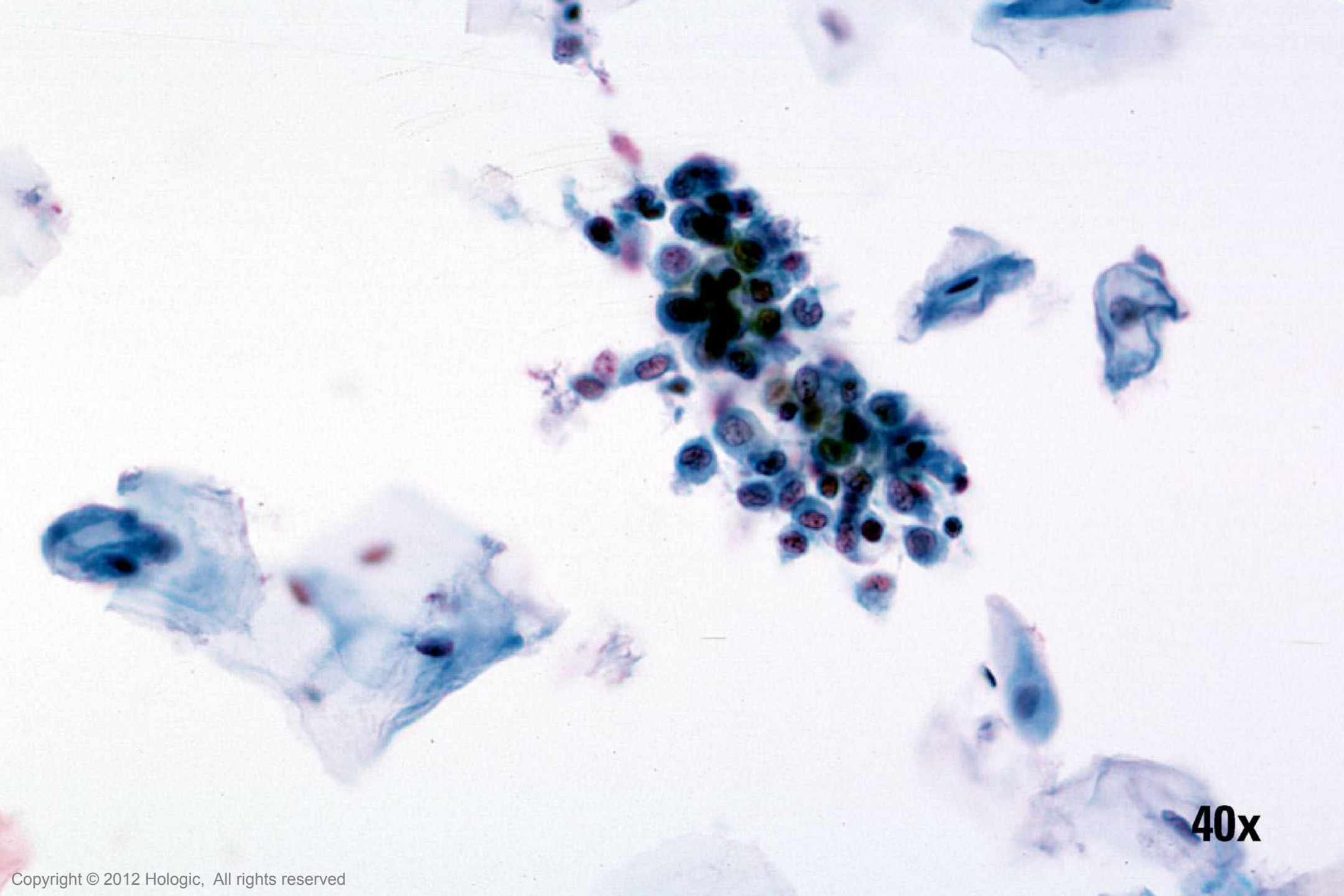


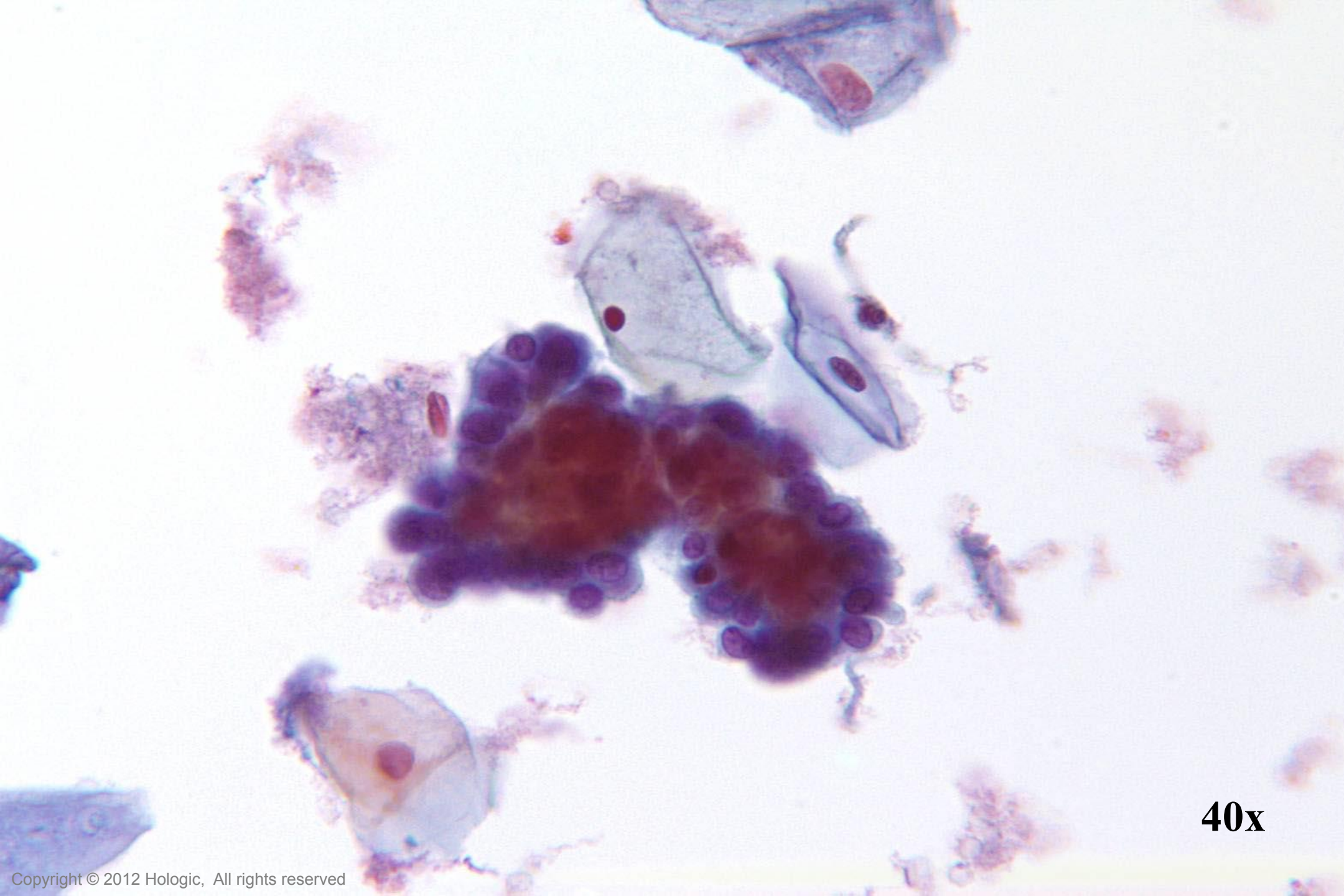












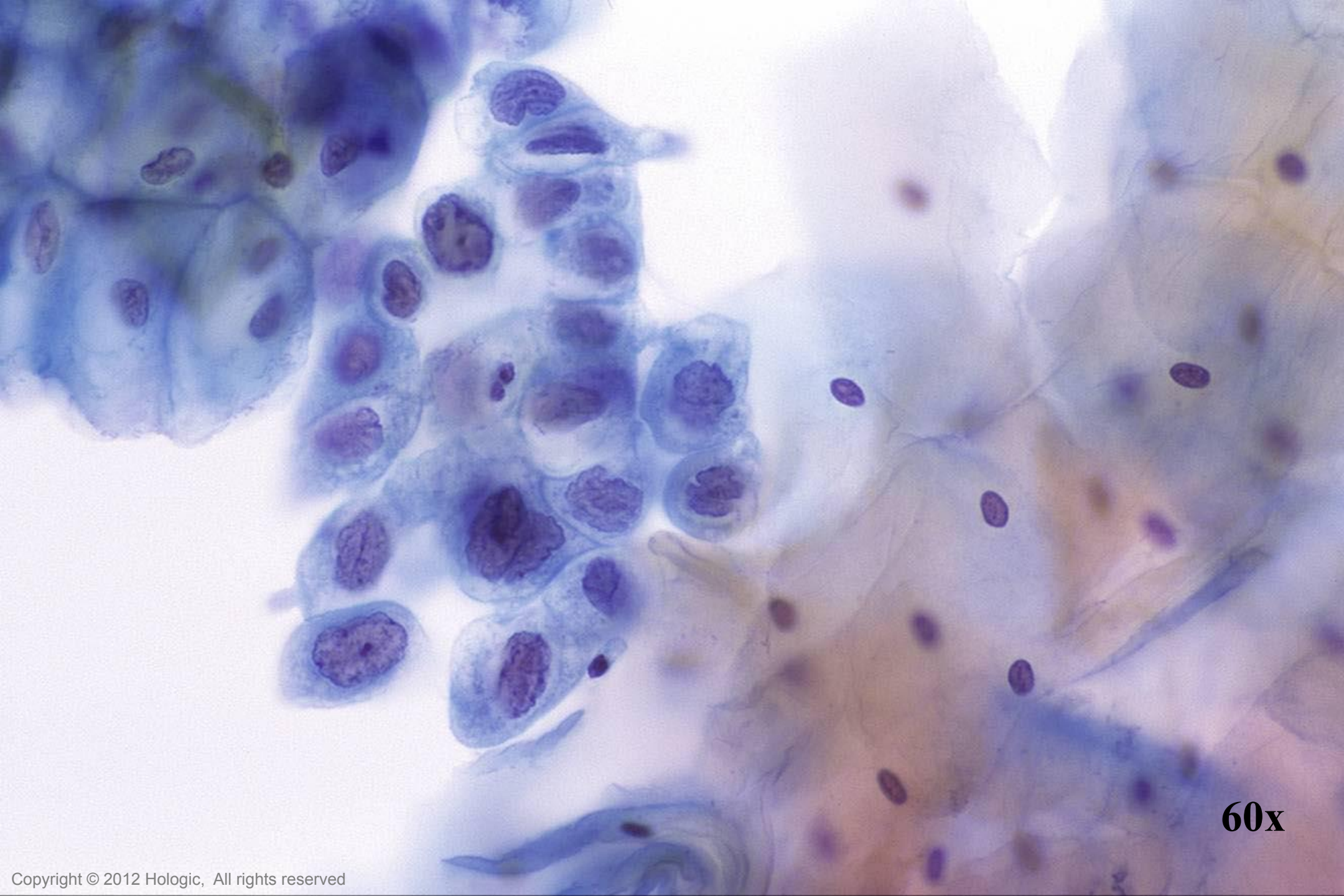
HSIL vs. Immature Squamous Metaplasia

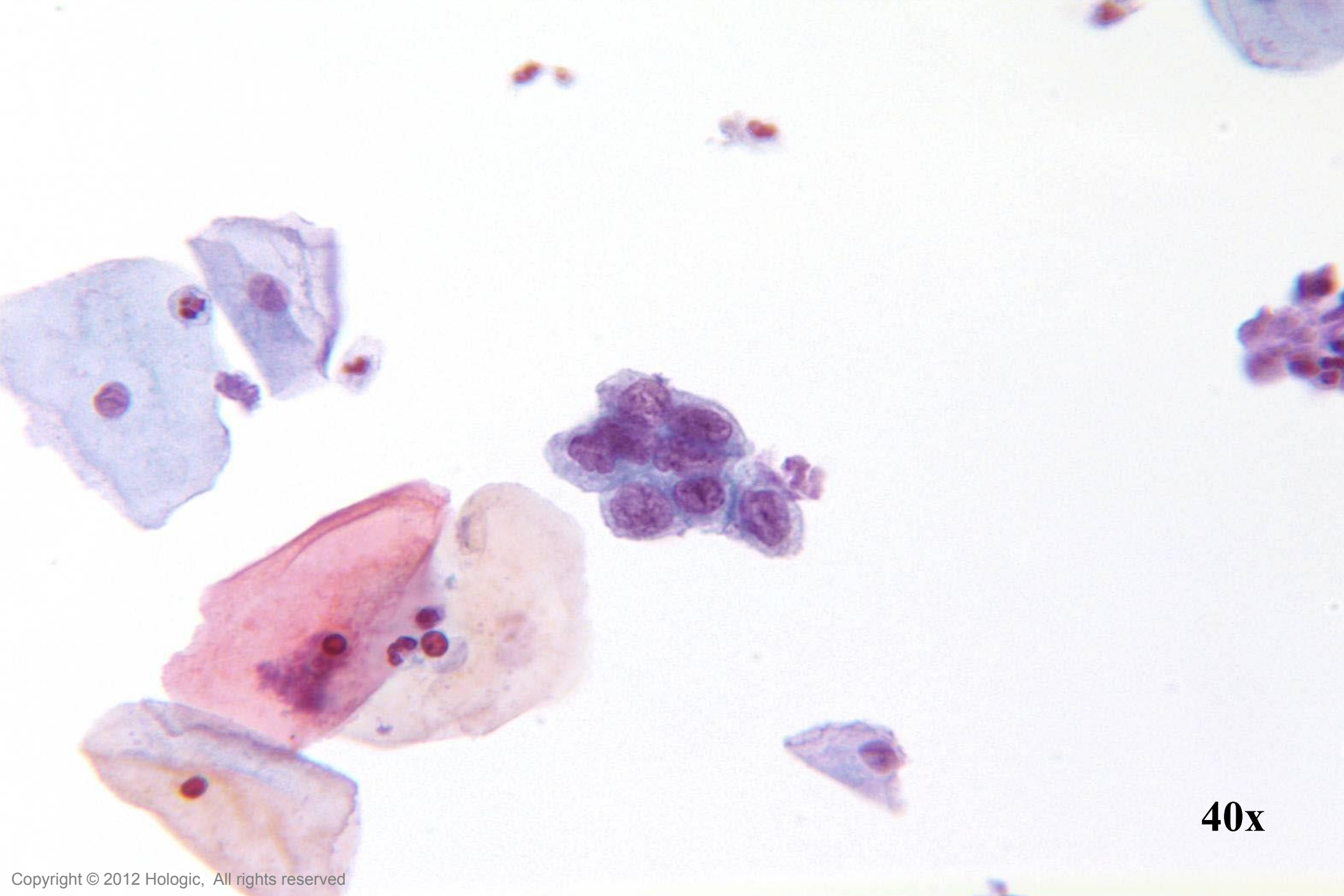
HSIL

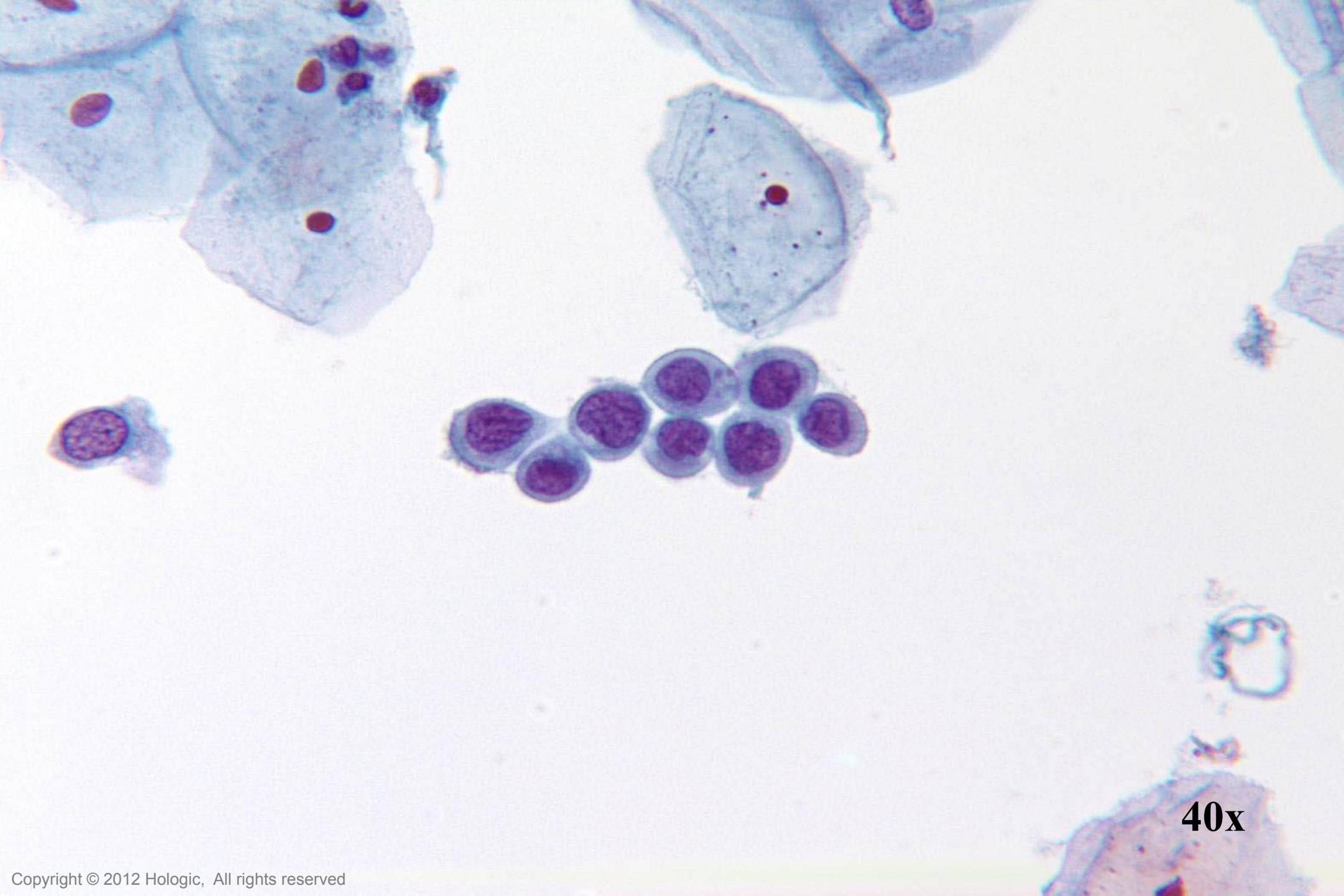
- Single cells, clusters, and thickened plaques
- Variable hyperchromasia
- Irregular nuclear membranes
- Coarse clumped chromatin
- Variation in nuclear size within a cluster

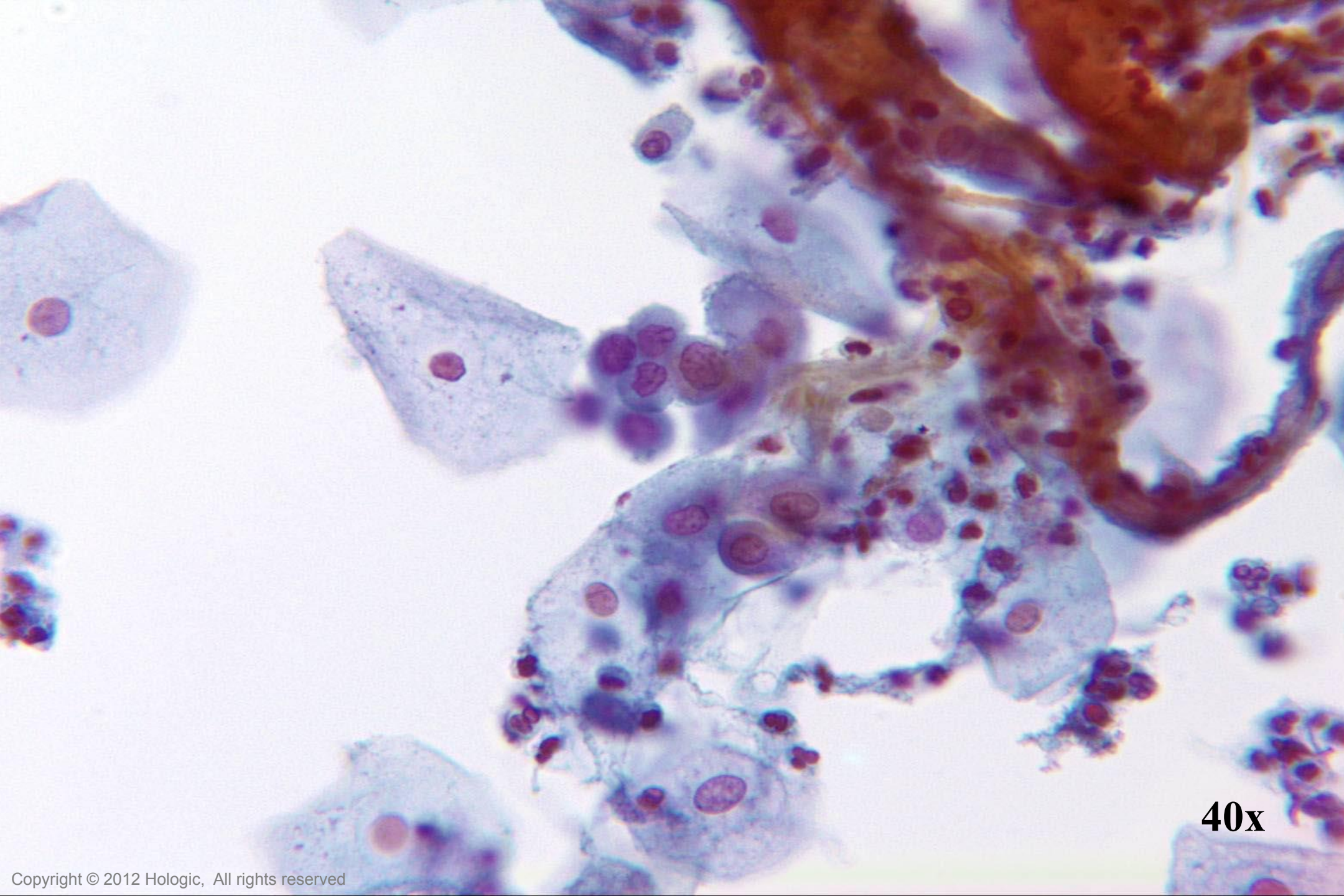
Immature Squamous Metaplasia

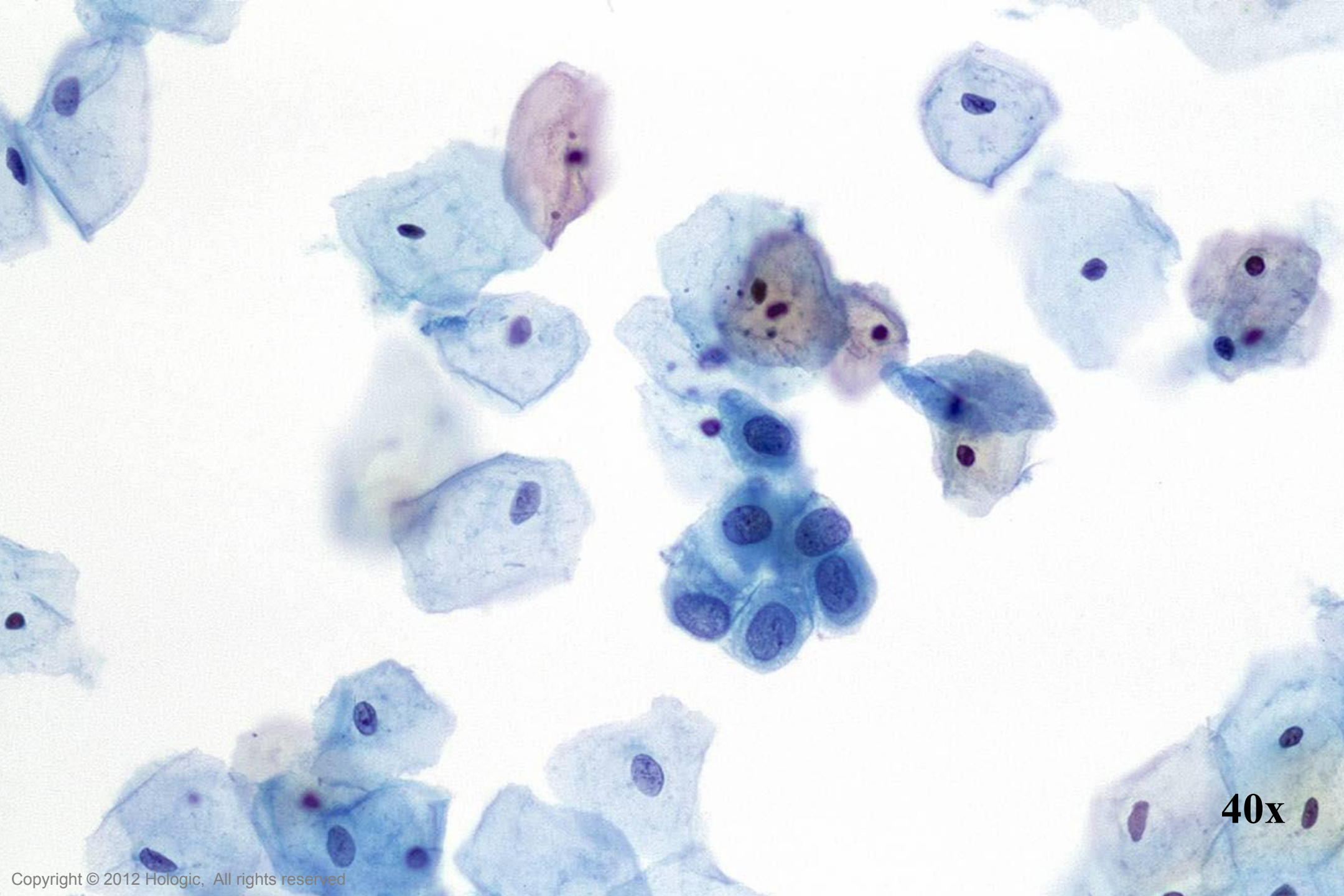
- Single cells & cobblestone sheets
- Normochromatic
- Regular nuclear membranes
- Evenly distributed chromatin with pinpoint chromocenters
- Nuclear size & shape consistent

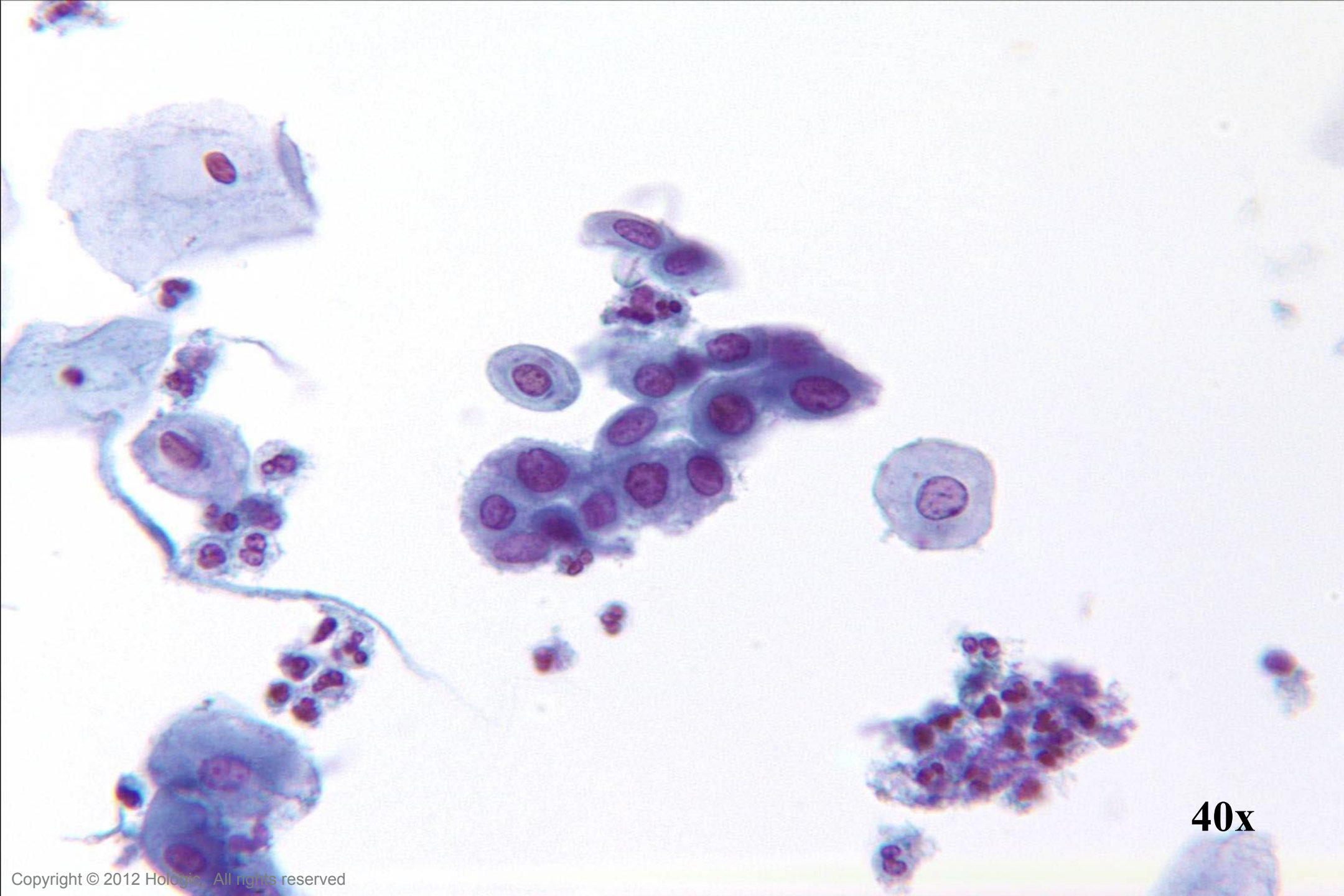












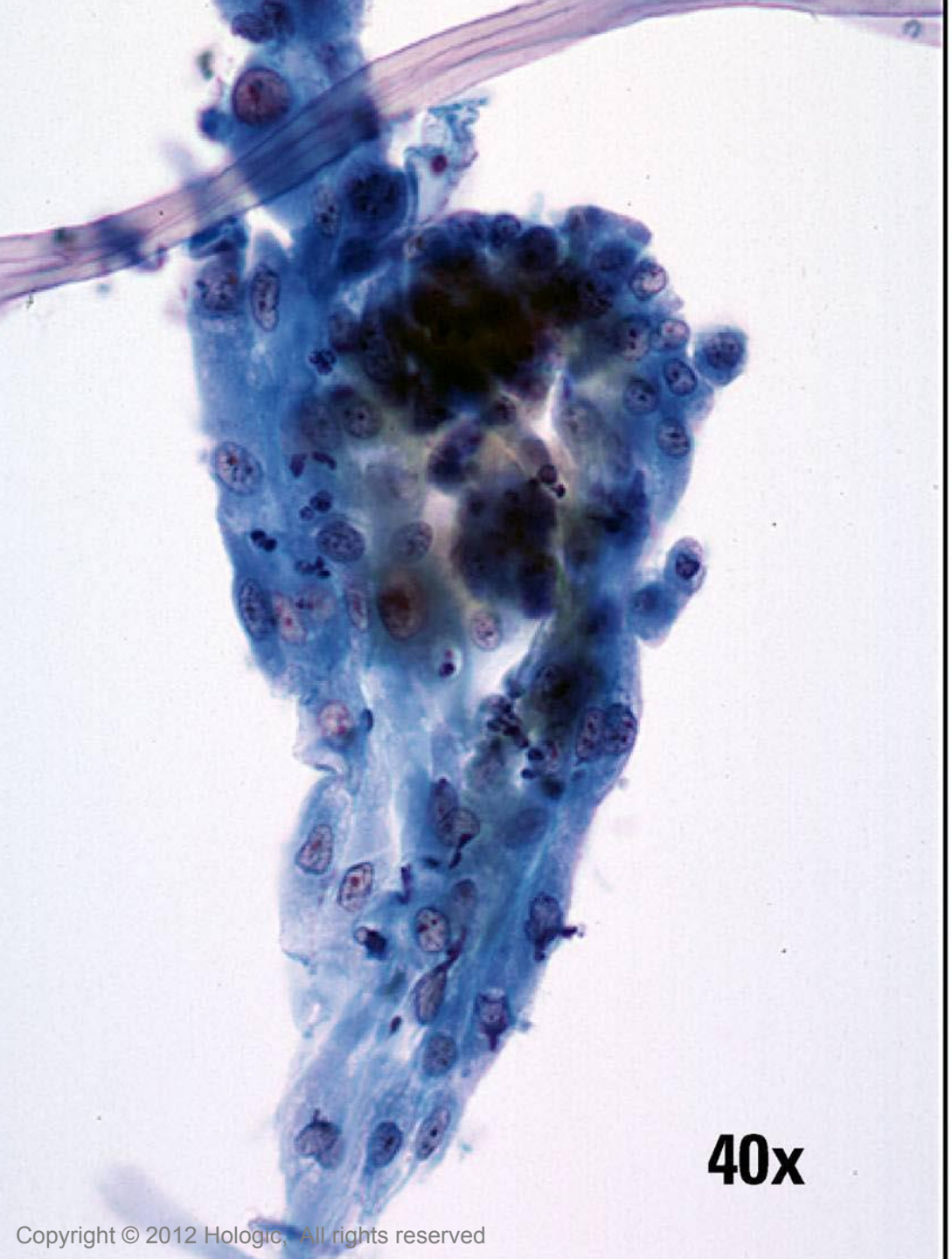
Repair vs. Poorly Differentiated SCC

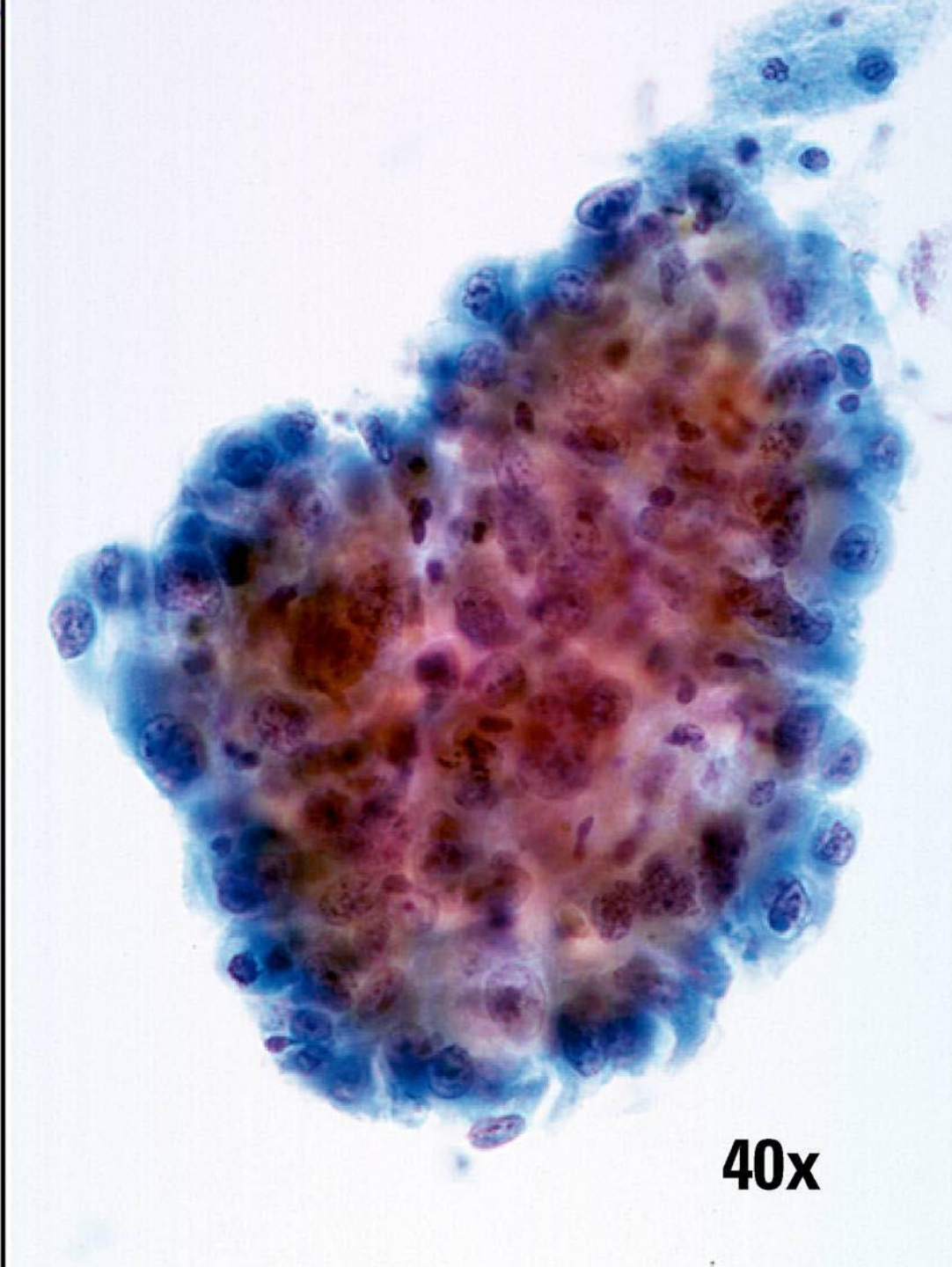
Repair (typical)

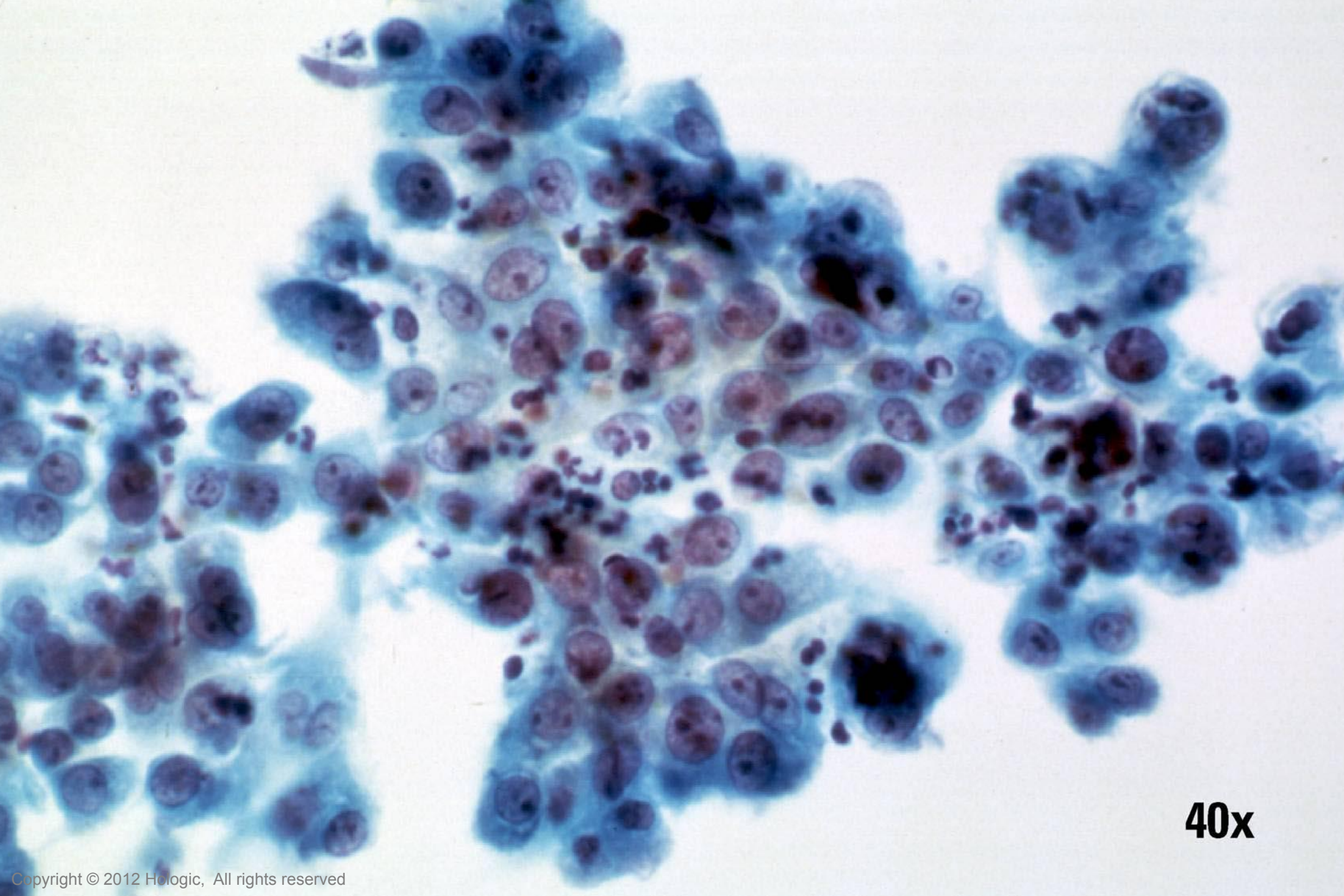
- Cohesive sheets
- Significant nuclear size variation but typically round/oval in shape
- Thin, well defined nuclear membranes
- More open chromatin pattern with minimal variability
- Centrally located macronucleoli with smooth, round contours
- Virtually all nuclei display nucleoli

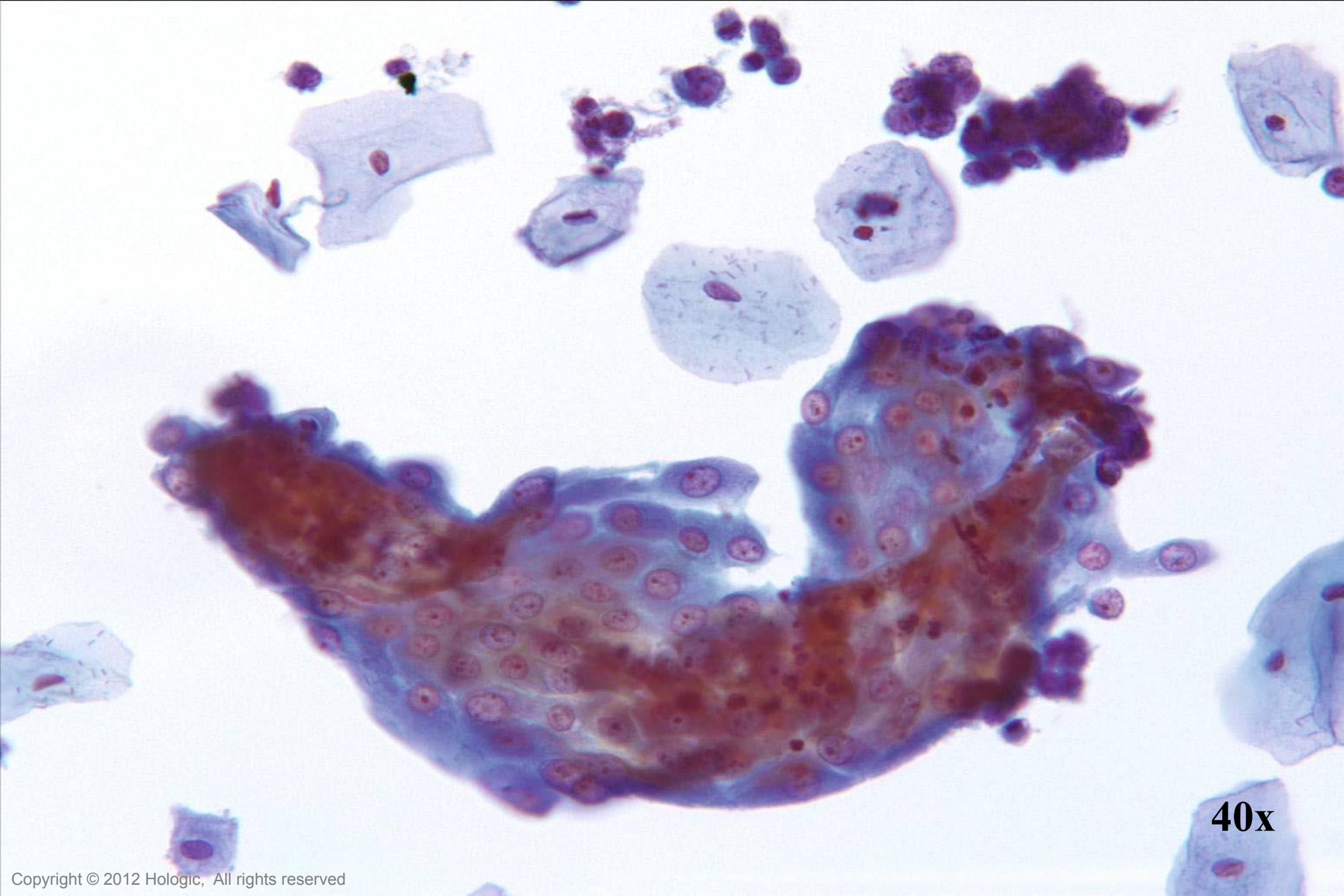
Poorly Differentiated SCC

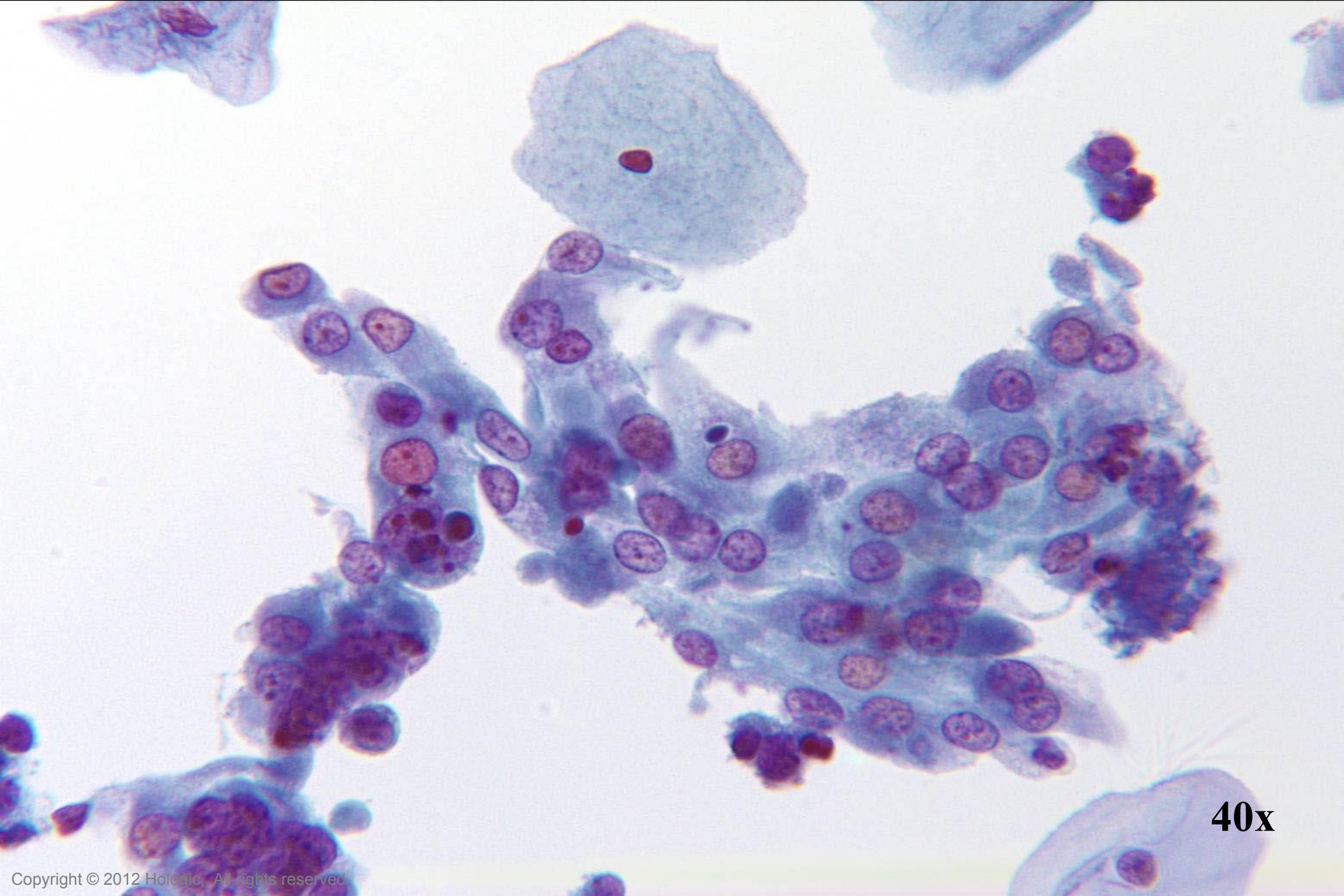
- Poorly cohesive sheets and single cells
- Irregular nuclear shapes & sizes
- Thickened nuclear membranes
- Irregular chromatin clumping
- Nucleoli variable in shape, size, number and position
- Some nuclei display nucleoli, some nuclei do not

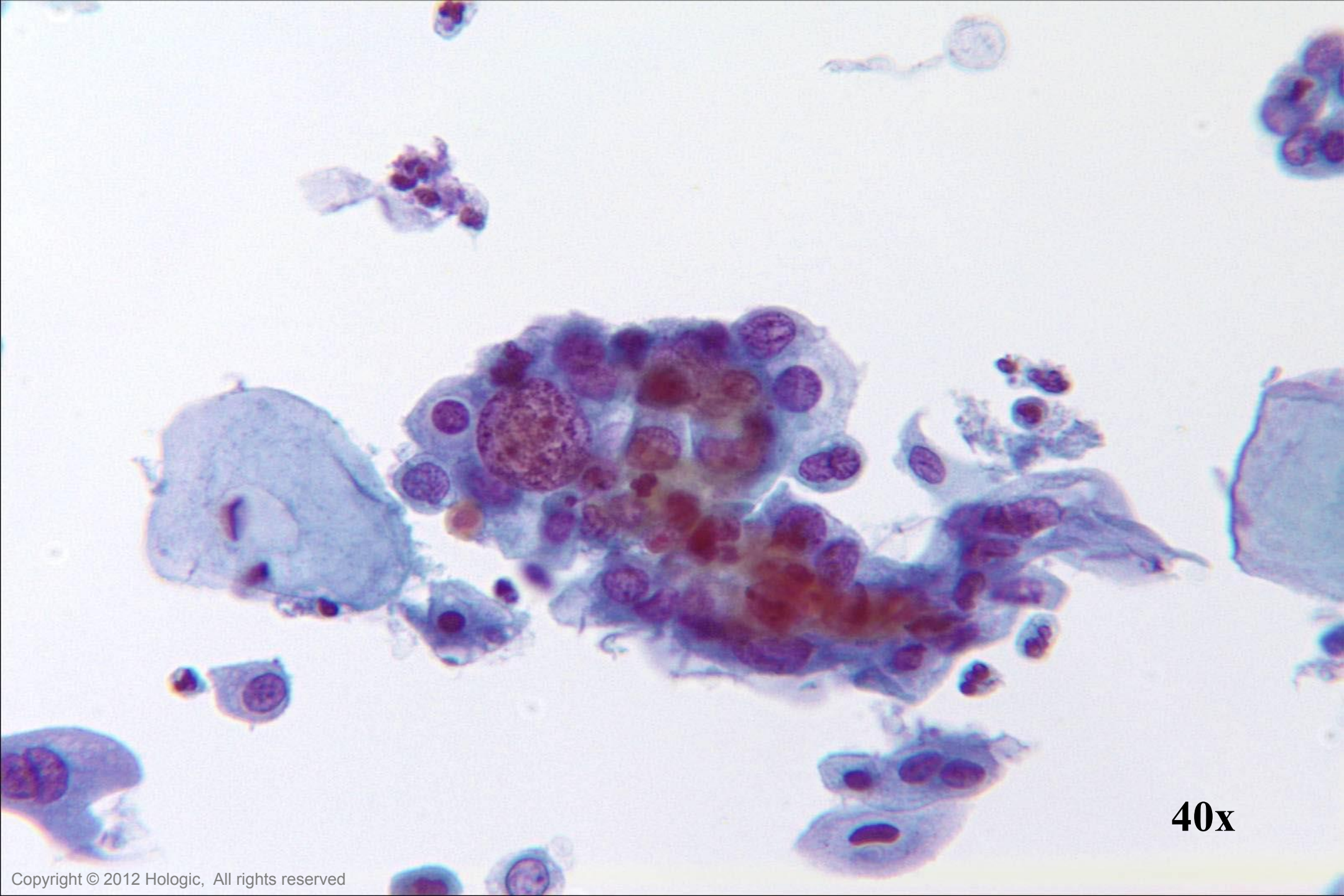


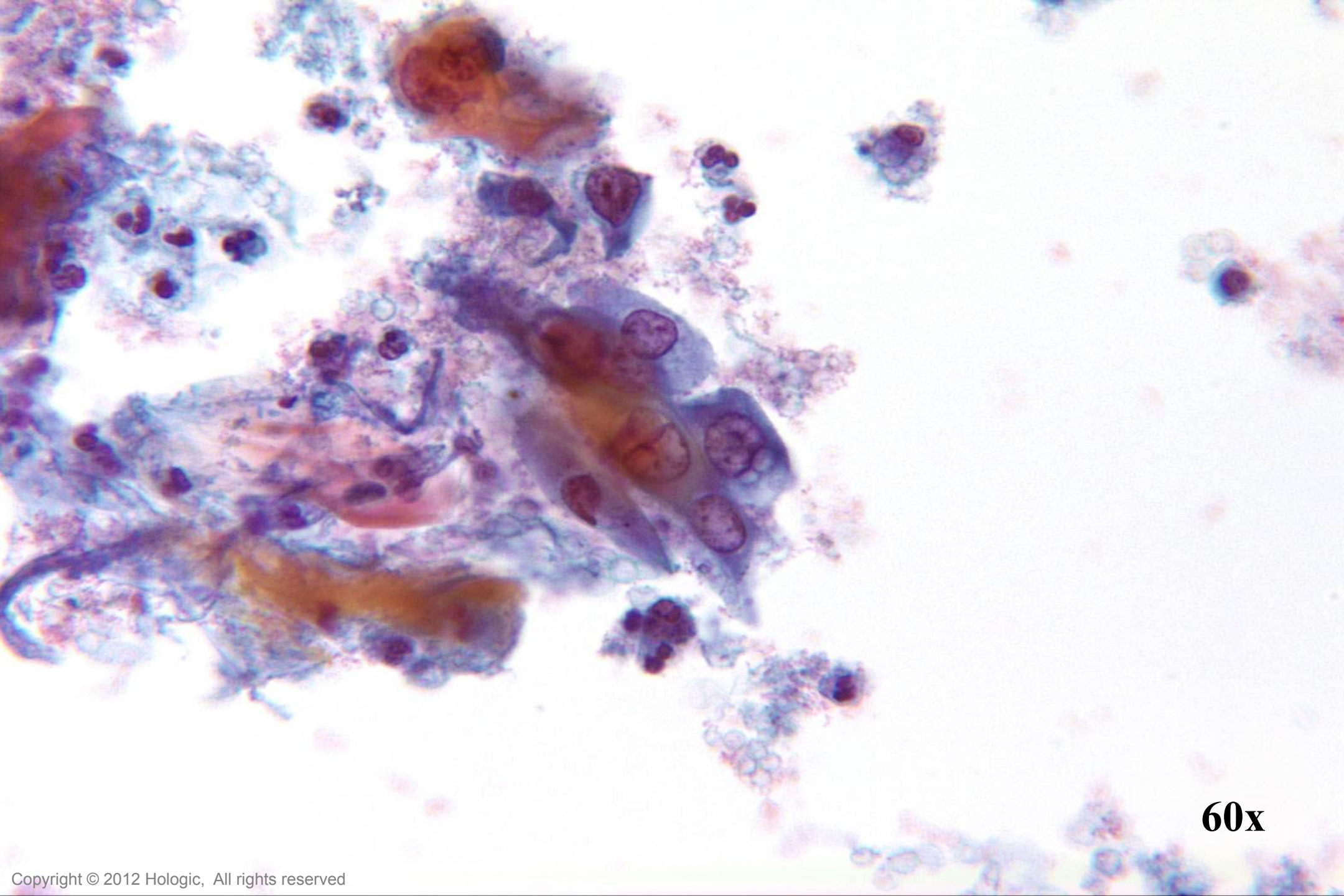












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Any Questions?