



GLANDULAR STUFF

## Glandular Disease Detection - Published Studies

The detection of endocervical glandular lesions is an essential function of the Pap test. However, abnormal glandular cells in the Pap sample may also originate from the endometrium or from extrauterine sites.

The Pap test is not intended to be a screening test for such lesions.

When suspected glandular abnormalities are identified, their accurate classification as true glandular versus squamous lesions is important for proper evaluation and subsequent treatment (e.g. choice of excisional biopsy method versus conservative follow-up). Multiple peer-reviewed publications report on the improved ability of the ThinPrep® System to detect glandular disease versus the conventional Pap smear. Although these studies do not consistently address sensitivity of different Pap testing methods in detecting specific types of glandular disease, the reported results are consistent with more frequent biopsy confirmation of abnormal glandular findings by the ThinPrep Pap Test compared to conventional cytology.

Thus, the finding of a glandular abnormality on a ThinPrep Pap Test slide merits increased attention for definitive evaluation of potential endocervical or endometrial pathology.

### Suggested Readings

Ashfaq R, Gibbons D, Vela C, Saboorian MH, Iliya F. ThinPrep Pap Test. Accuracy for glandular disease. *Acta Cytol* 1999; 43: 81-5

Bai H, Sung CJ, Steinhoff MM: ThinPrep Pap Test promotes detection of glandular lesions of the endocervix. *Diagn Cytopathol* 2000;23:19-22

Carpenter AB , Davey DD: ThinPrep Pap Test: Performance and biopsy follow-up un a university hospital. *Cancer Cytopathology* 1999; 87: 105-12

Guidos BJ, Selvaggi SM. Detection of endometrial adenocarcinoma with the ThinPrep Pap test. *Diagn Cytopathol* 2000; 23: 260-5

Schorge JO, Hossein Saboorian M, Hynan L, Ashfaq R. ThinPrep detection of cervical and endometrial adenocarcinoma: A retrospective cohort study. *Cancer Cytopathology* 2002; 96: 338-43

Wang N, Emancipator SN, Rose P, Rodriguez M, Abdul- Karim FW. Histologic follow-up of atypical endocervical cells. Liquid-based, thin-layer preparation vs. conventional Pap smear. *Acta Cytol* 2002; 46: 453-7

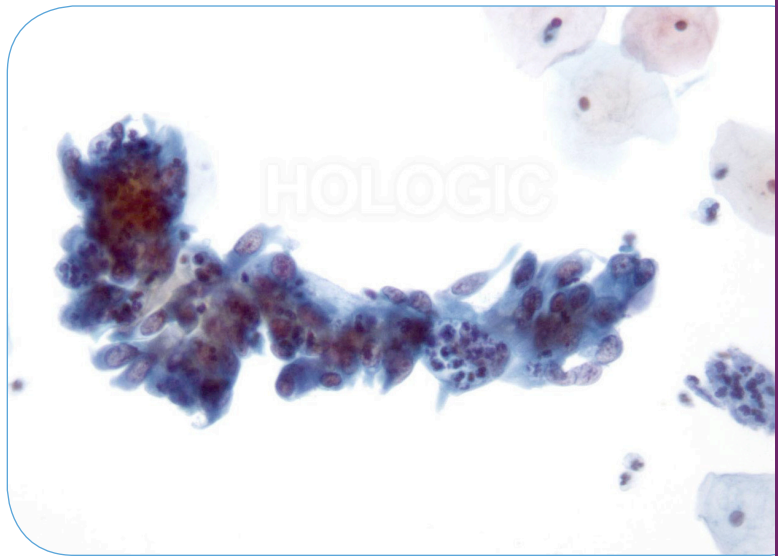


### Tissue Presentation

A well organized, flat sheet of glandular cells in a “school of fish” arrangement.

Biopsy: Decidual changes

20 X

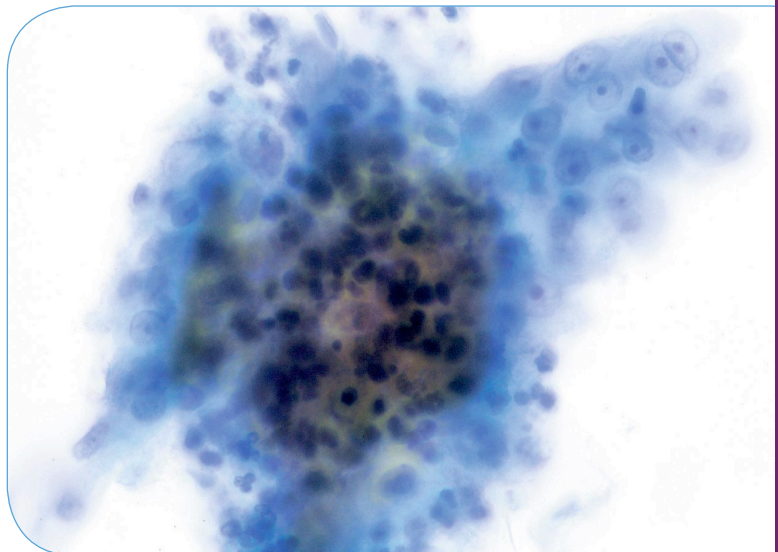


### Cytoplasm

Pictured is a sheet of endocervical cells with slightly disordered architecture, slight depth of focus to group, abundant cytoplasm, uniform, bland chromatin pattern and prominent nucleoli in each nucleus. The diagnosis of atypia may arise due to depth of focus to the group and slightly disordered architecture.

Biopsy: Inflammatory Atypia

60 X

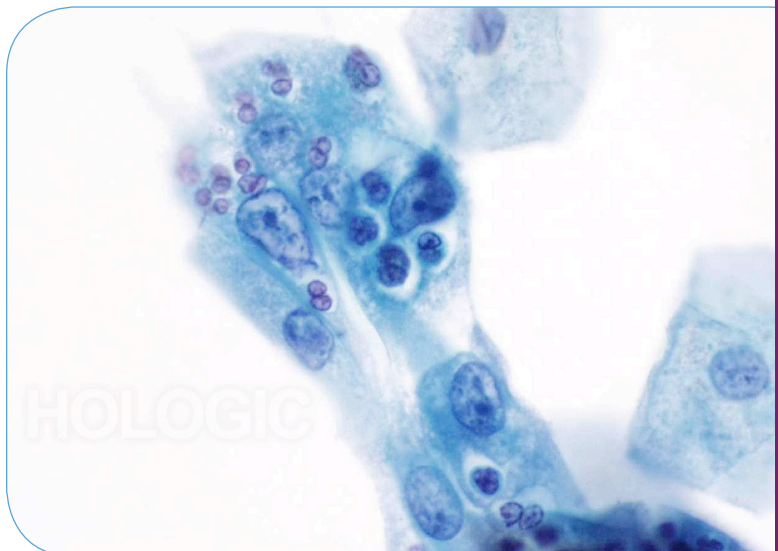


### N/C Ratio

Atypical cells with abundant cytoplasm maintaining a low N/C ratio.

Biopsy: Endocervical polyp

60 X



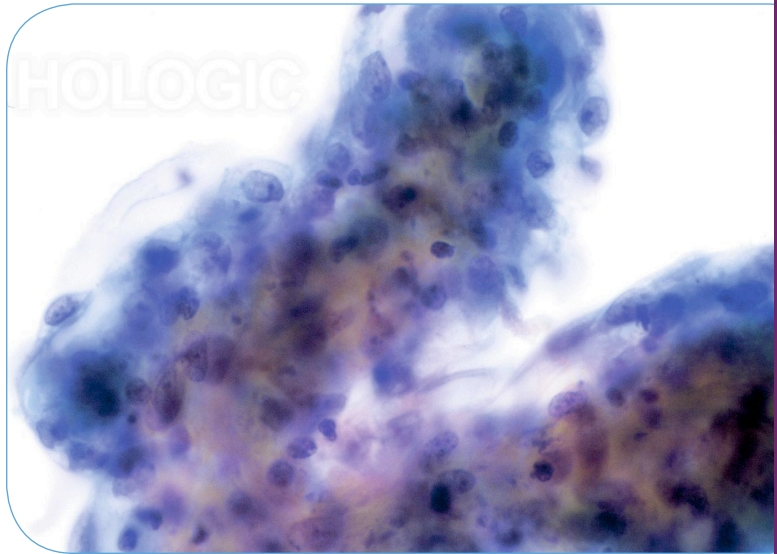
### Nucleus

The specimen contains a rounded up (3-dimensional) group of endocervical cells with slight disruption to architecture.

Nuclei are all similar in size and nuclear membranes are smooth to slightly irregular.

Biopsy: Chronic Inflammation

60 X

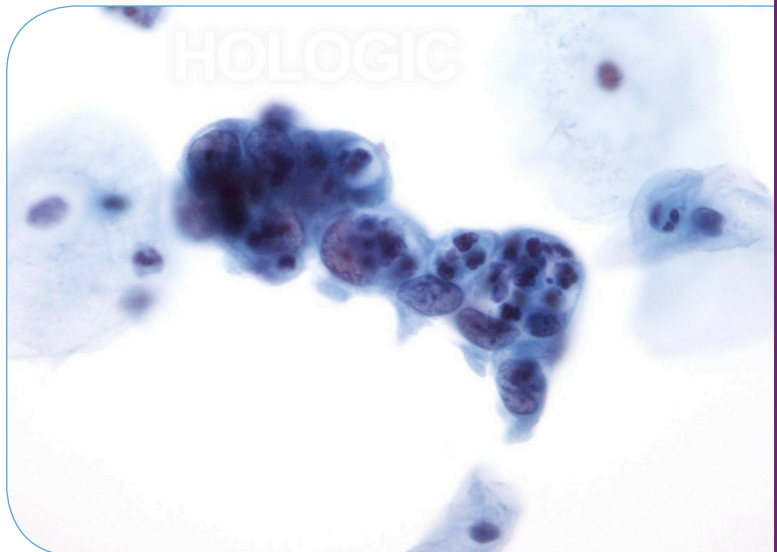


### Nuclear Membrane

The nuclei in this group exhibit nuclear membranes with slight irregularities and thickening.

Biopsy: Decidual changes

40 X



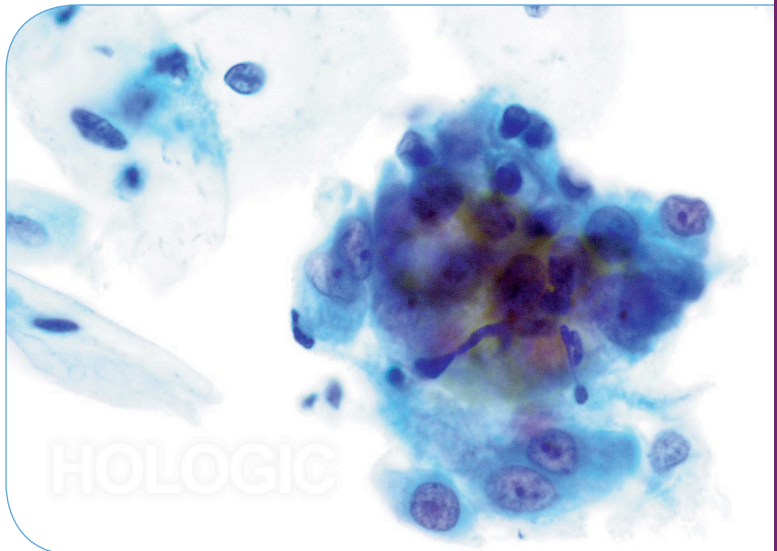
### Chromatin

A loose grouping of endocervical cells exhibits an apparent loss of polarity.

Nuclei are round to oval with slight nuclear membrane irregularities and slight crowding. The chromatin is granular but evenly distributed and prominent nucleoli are present.

Biopsy: Chronic Inflammation

60 X



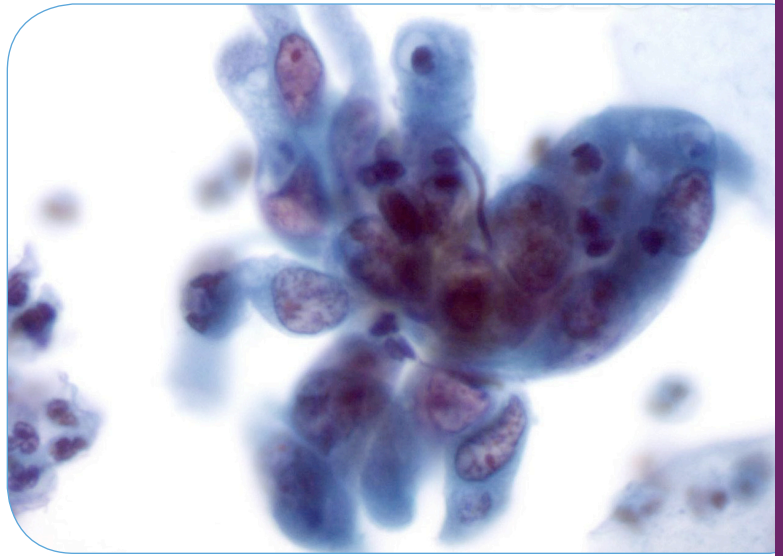


## **Nucleoli**

Nuclei contain single to multiple nucleoli that are small to moderate in size.

Biopsy: Decidual changes

60 X

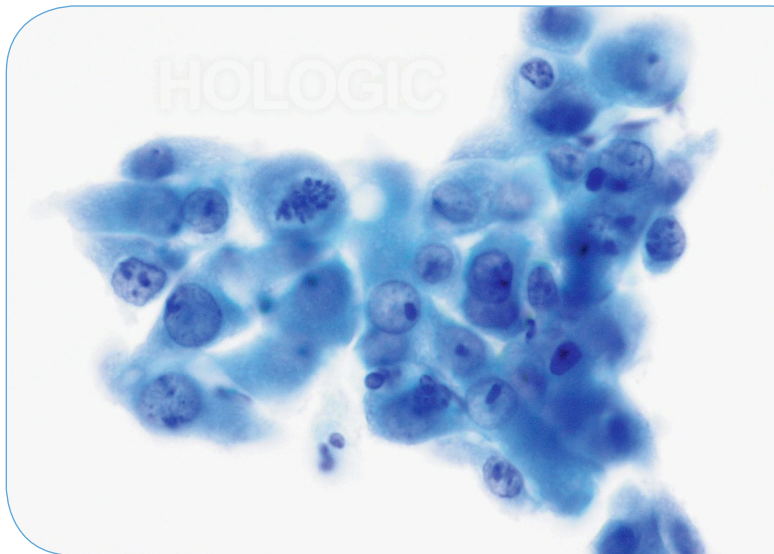






Repair may contain mitosis  
and macronucleoli.

(4 of 4) 60 X





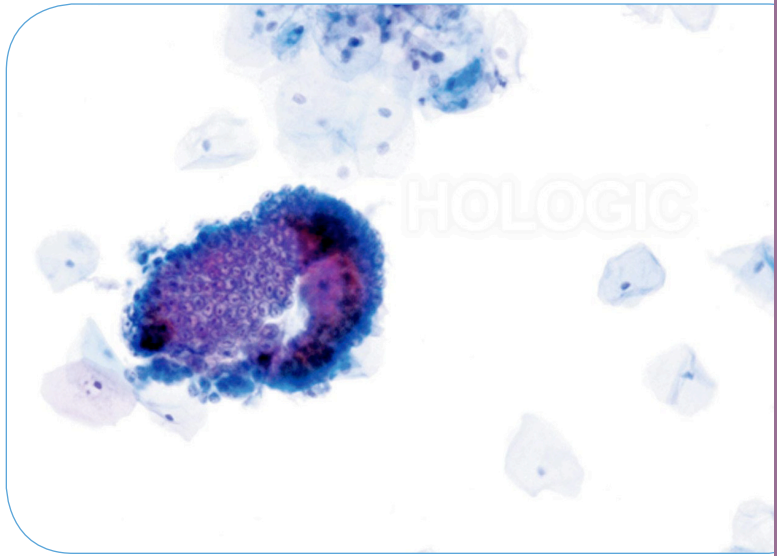




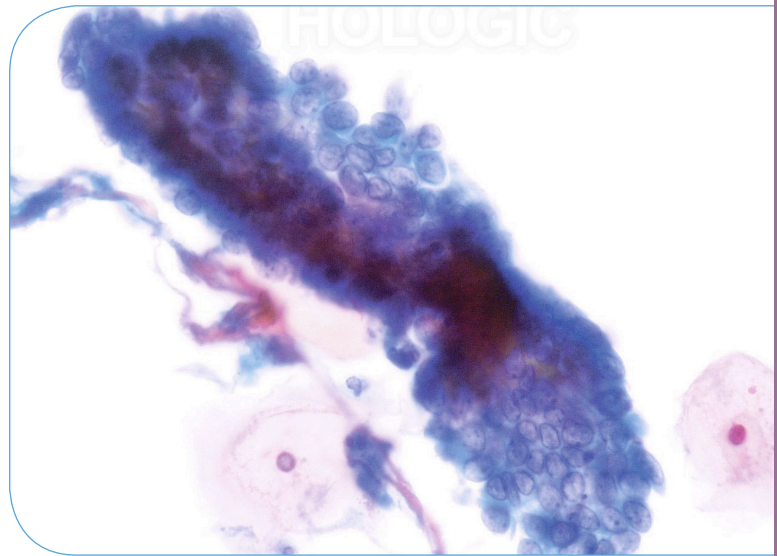
**Tissue Presentation**

A fragment of cells from the lower uterine segment, which has folded over itself causing a three dimensional appearance.

(1 of 3) 20X

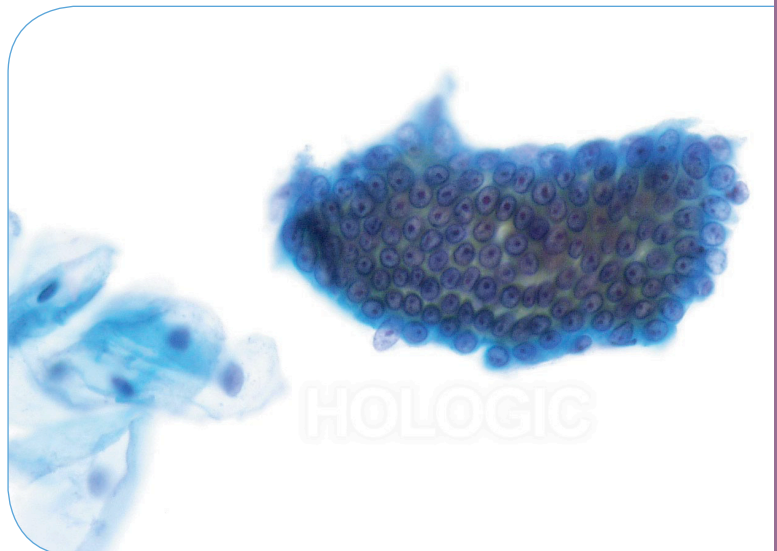


(2 of 3) 20X



Lower uterine segment may have prominent nucleoli.

(3 of 3) 40X





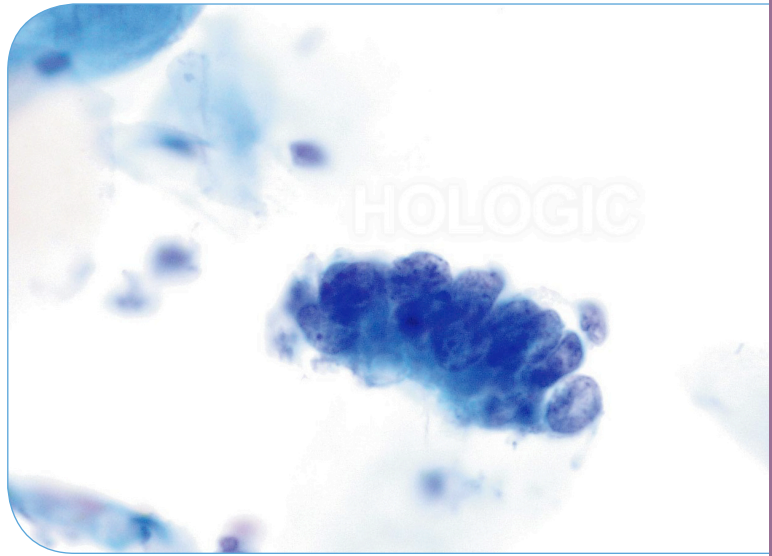


**Tissue Presentation**

Endocervical cells presenting in a strip with pronounced nuclear crowding.

Biopsy: AIS

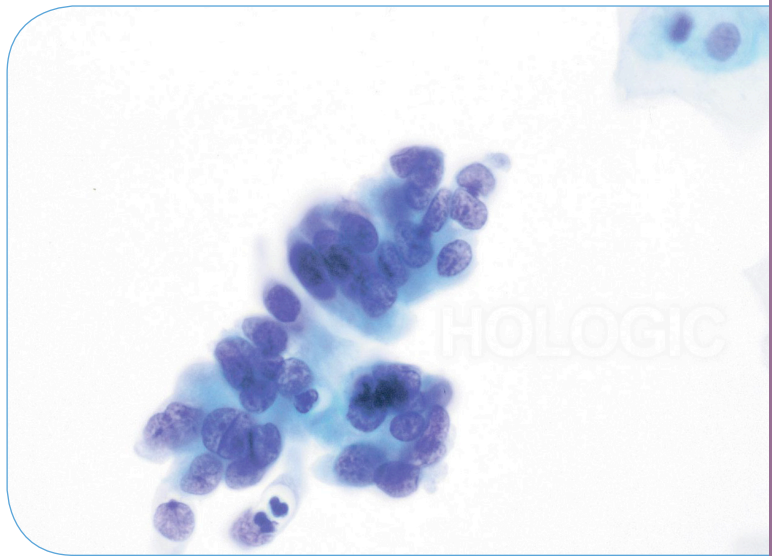
(1 of 3) 60X



A strip of endocervical cells exhibiting pseudostratification and finely vacuolated cytoplasm with indistinct cytoplasmic borders. Architecture is disrupted although cells are still attempting to maintain a glandular configuration. Note increased N/C ratio and the variable presence of nucleoli.

Biopsy: AIS

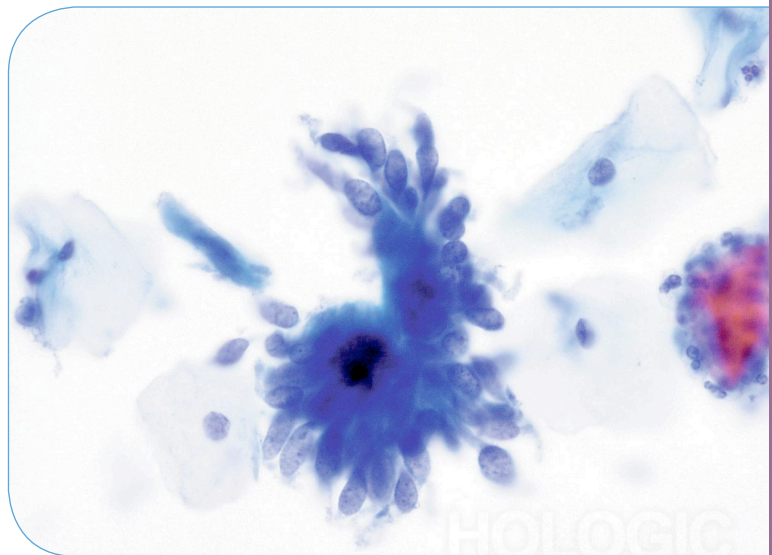
(2 of 3) 60X



Endocervical cells presenting in a pseudo-rosette formation and exhibiting “feathering” and nuclear elongation due to crowding.

Biopsy: AIS

(3 of 3) 60X





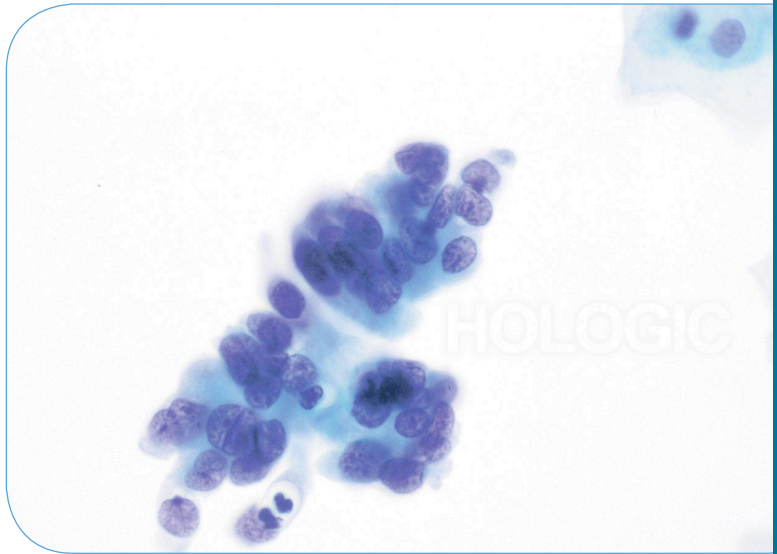
**Tissue Presentation**

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Biopsy: AIS

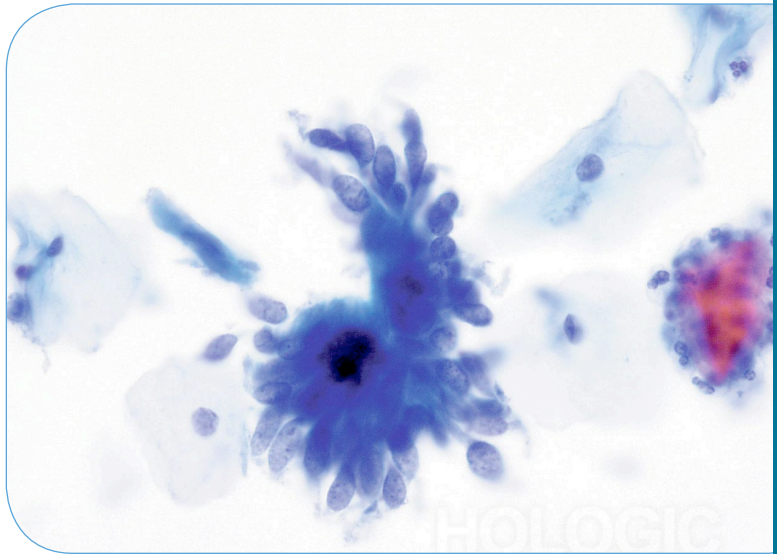
(1 of 5) 60 X



Endocervical cells presenting in a pseudo-rosette formation and exhibiting “feathering” and nuclear elongation due to crowding.

Biopsy: AIS

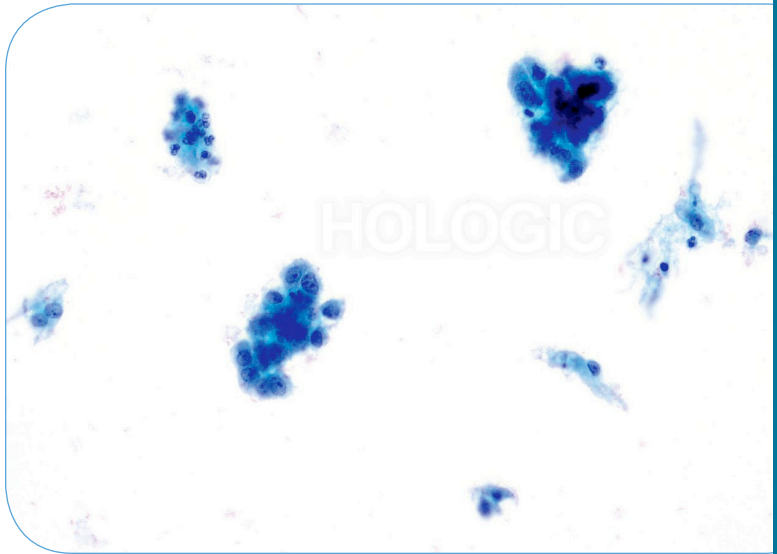
(2 of 5) 60 X



Variably sized, crowded, hyperchromatic groups of cells are seen on screening power which warrant a closer inspection.

Biopsy: AIS

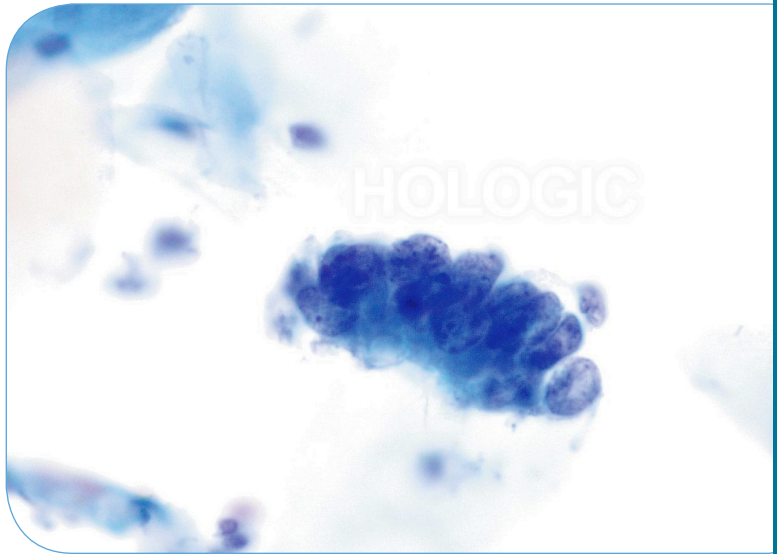
(3 of 5) 20 X



Endocervical cells presenting in a strip with pronounced nuclear crowding.

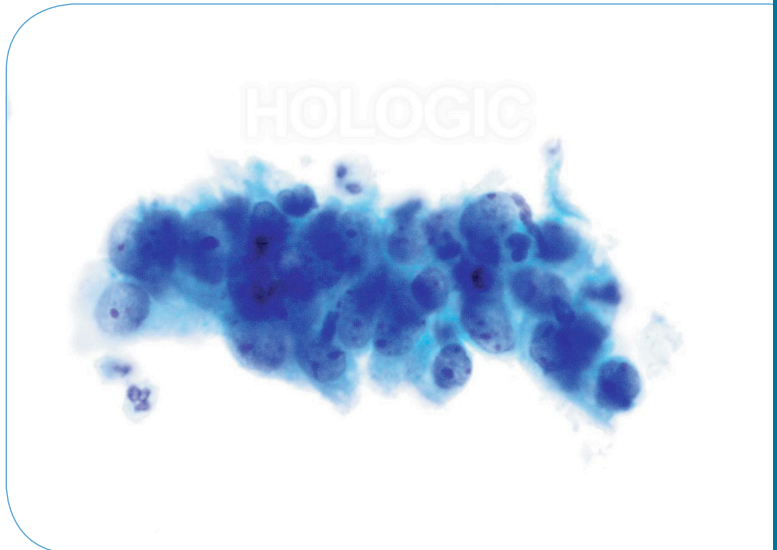
Biopsy: AIS

(4 of 5) 60X



This crowded, stratified group of glandular cells comes from a case of AIS. Note the basal nuclei piling up from the lower layer of the epithelium.

(5 of 5) 60X





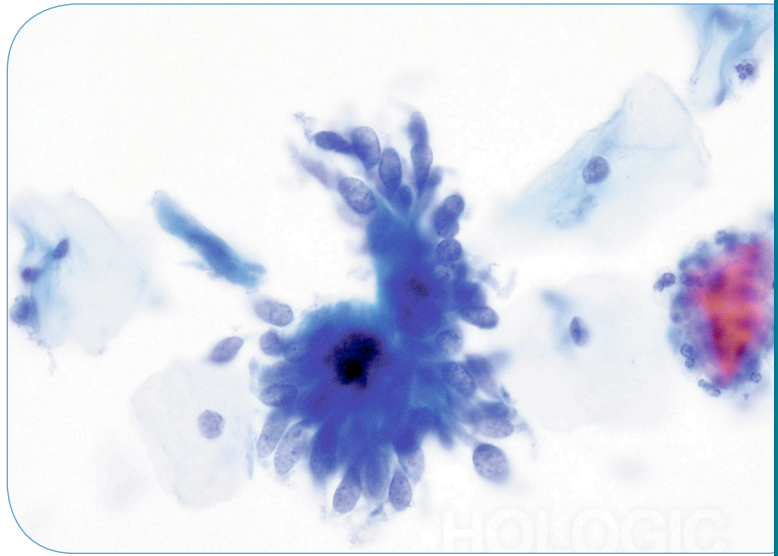


**Nucleus**

Endocervical cells presenting in a pseudo-rosette formation and exhibiting “feathering” and nuclear elongation due to crowding.

Biopsy: AIS

( 1 of 2 ) 60 X



Nuclear elongation is clearly evident in this group of atypical endocervical cells. Also noted is loss of nuclear polarity, loss of normal architecture, nuclear crowding, and “molding” of the nuclei. Note the flat nuclear membranes where they push up against each other (a sign of true crowding).

Biopsy: AIS

( 2 of 2 ) 60 X

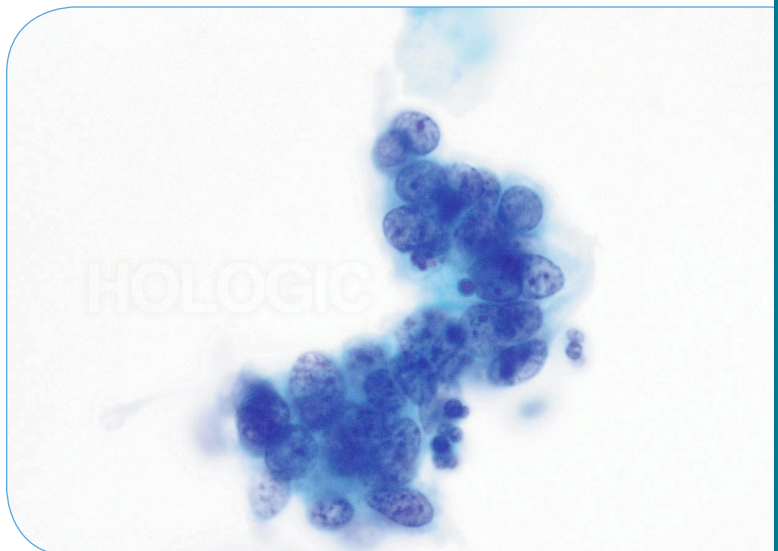


**Nuclear Membrane**

Nuclear membranes can be smooth to markedly irregular. This image exhibits nuclear membranes that are thickened and moderately irregular. Chromatin is coarse and nucleoli are prominent.

Biopsy: AIS

60 X

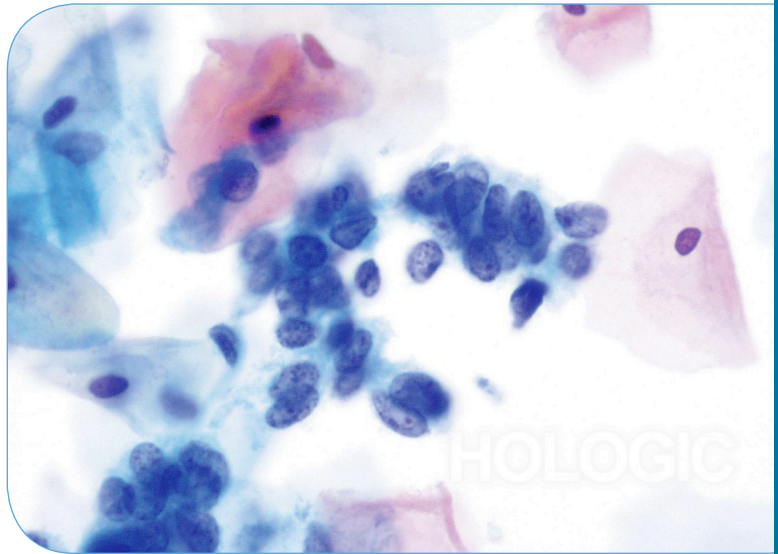


**Chromatin**

High N/C ratios are evident in nuclei that take up at least 2/3 of the cytoplasm. Chromatin is coarse but evenly distributed and micronucleoli are present.

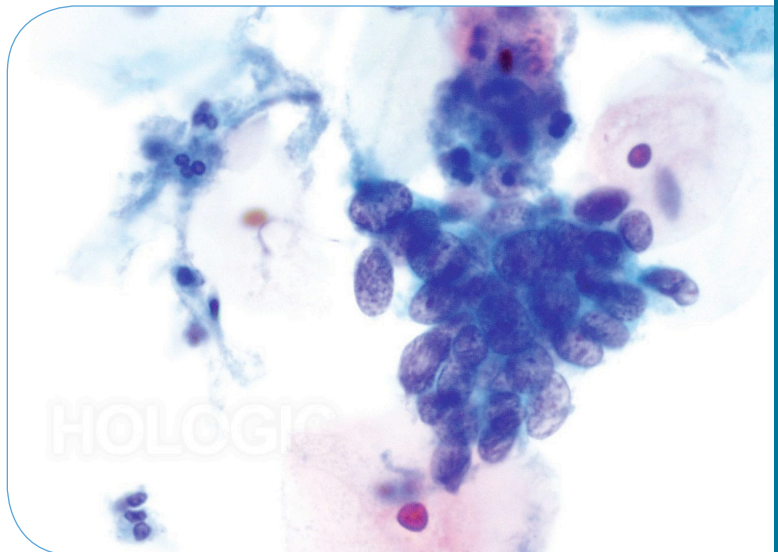
Biopsy: AIS

(1 of 2) 60X



v

(2 of 2) 60X



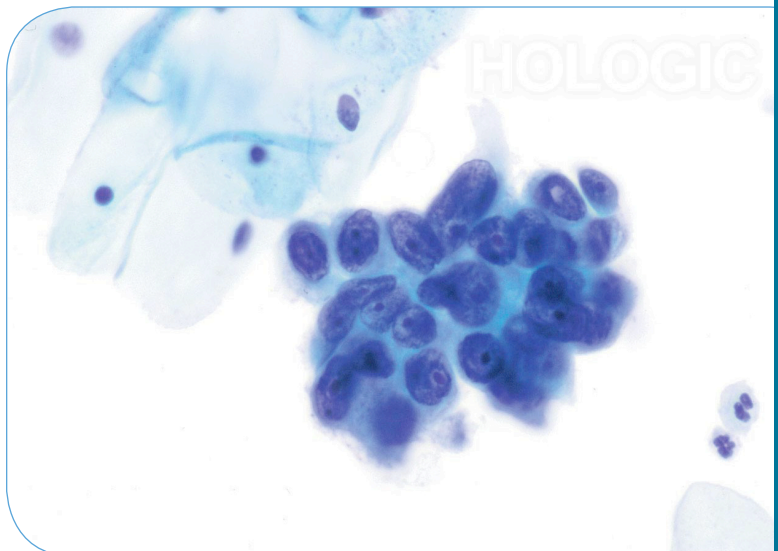
**Nucleoli**

Nucleoli can be indistinct to prominent. In this image, the nucleoli are prominent and present in a majority of the nuclei.

Rapid fixation makes the presence of nucleoli another important piece of criteria in the diagnosis of AIS.

Biopsy: AIS

60X







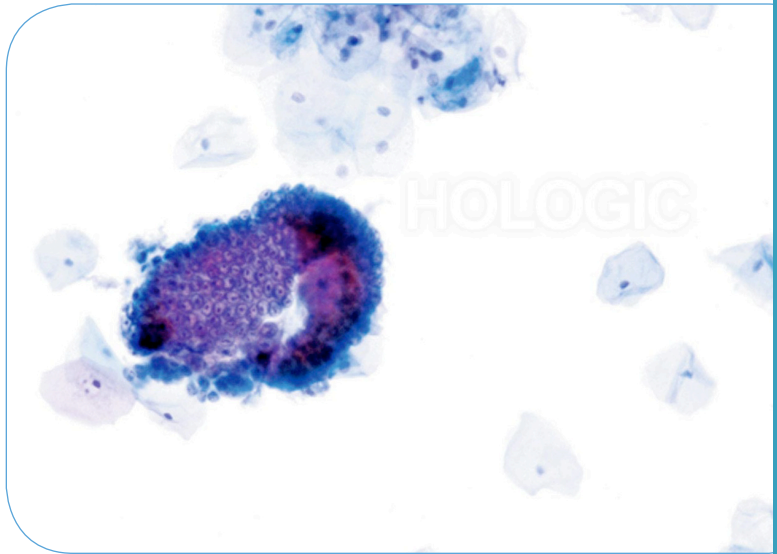




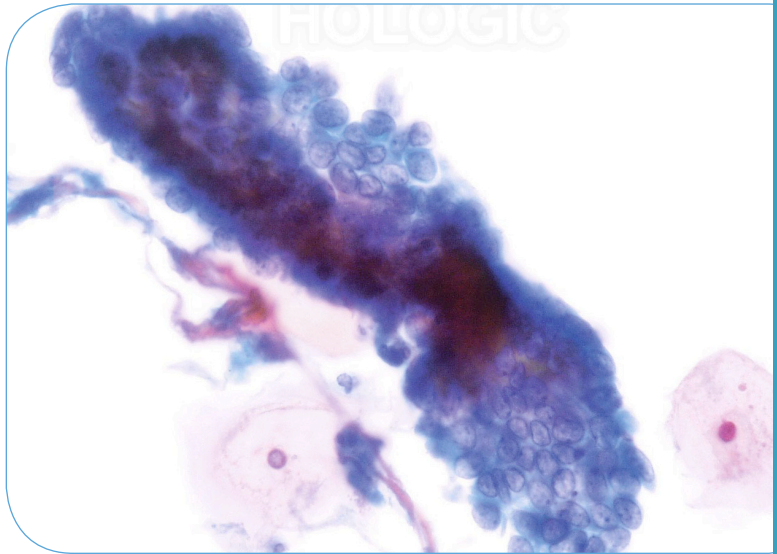
**Tissue Presentation:**

A fragment of cells from the lower uterine segment, which has folded over itself causing a three dimensional appearance.

(1 of 3) 20 X

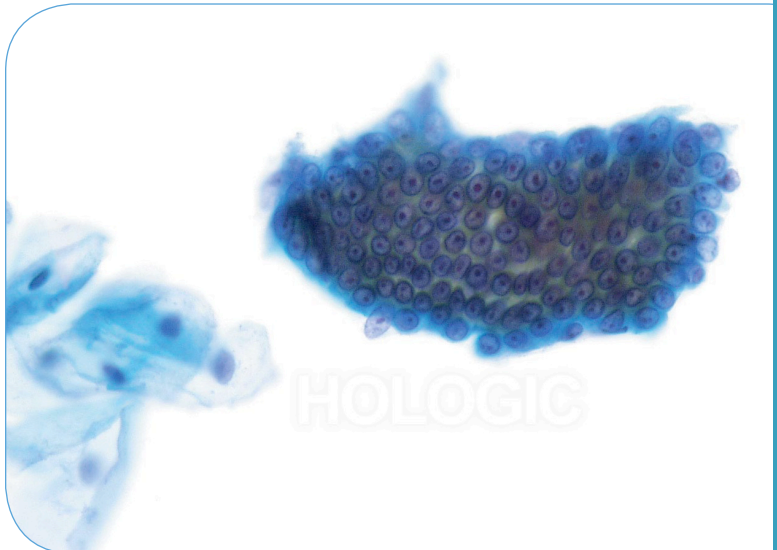


(2 of 3) 40 X



Lower uterine segment may have prominent nucleoli.

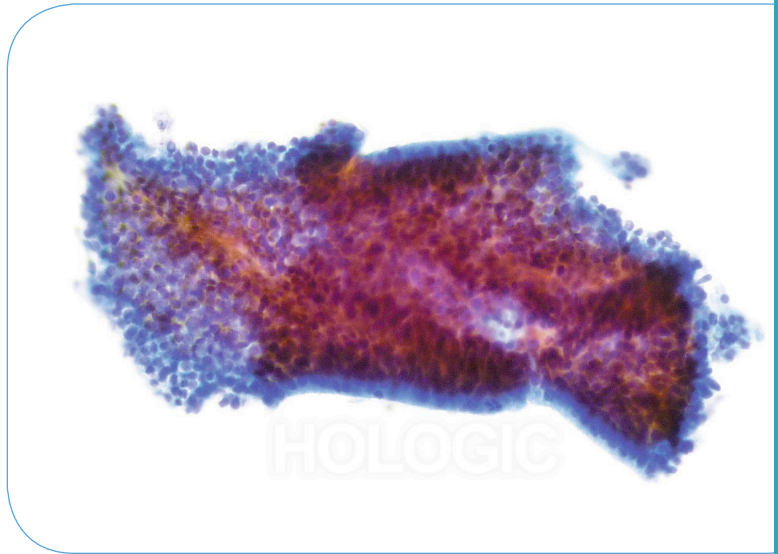
(3 of 3) 40 X



### Unique Features

This tissue fragment of lower uterine segment is composed of small, cuboidal cells with uniform nuclei and bland chromatin. At low power the cells appear crowded; however on closer inspection they are simply tightly packed. The cohesiveness and uniformity of such fragments at low power are the keys to diagnosis. A stromal component is usually present as well and is an aid in diagnosis.

20 X







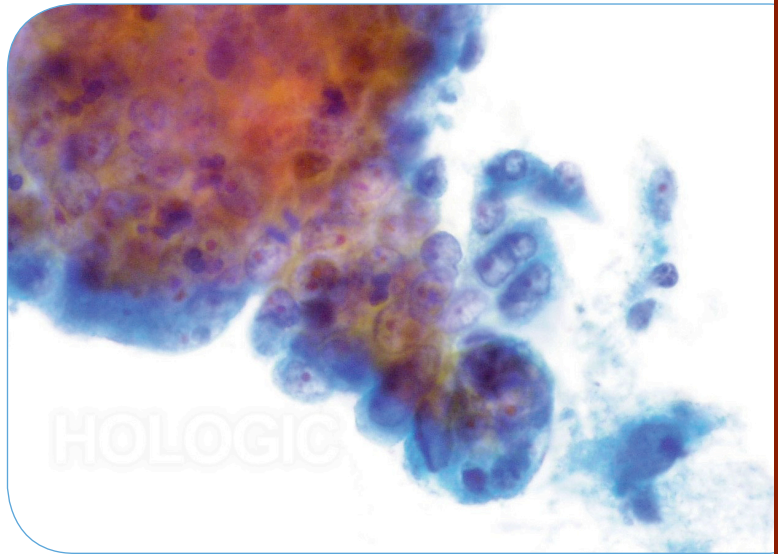




## Tissue Presentation

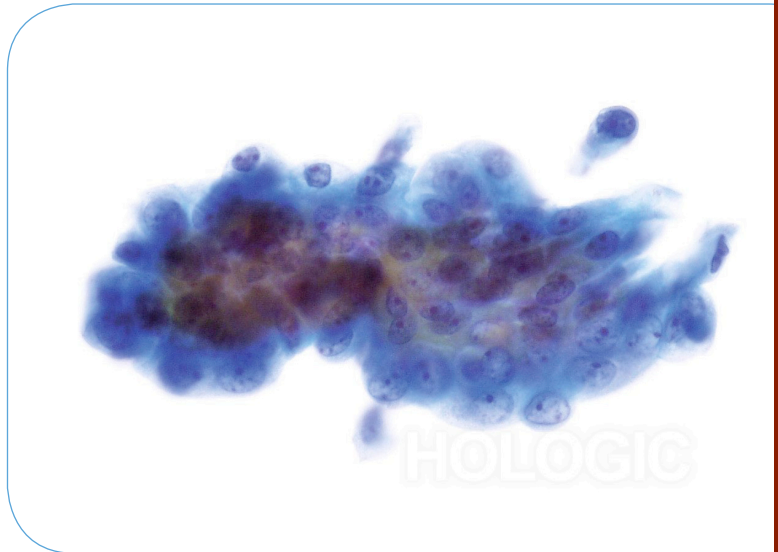
Cells occur in 3-dimensional clusters, 2-dimensional sheets and singly.

(1 of 2) 60 X



Glandular cell clusters round up in PreservCyt solution and may exhibit scalloping around the edges of the group. Note the smooth, distinct cytoplasmic borders to the edge of the group.

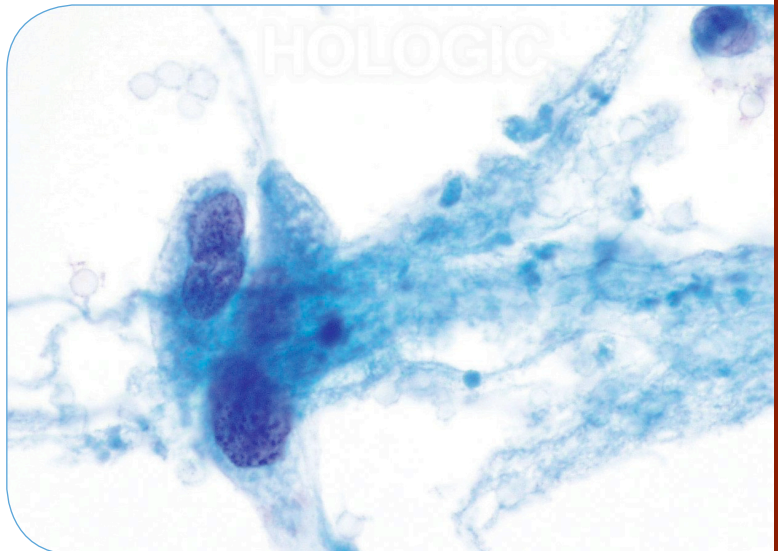
(2 of 2) 40 X



## Cytoplasm

The cytoplasm in adenocarcinoma can be finely vacuolated with multiple discrete vacuoles and distinct cell borders.

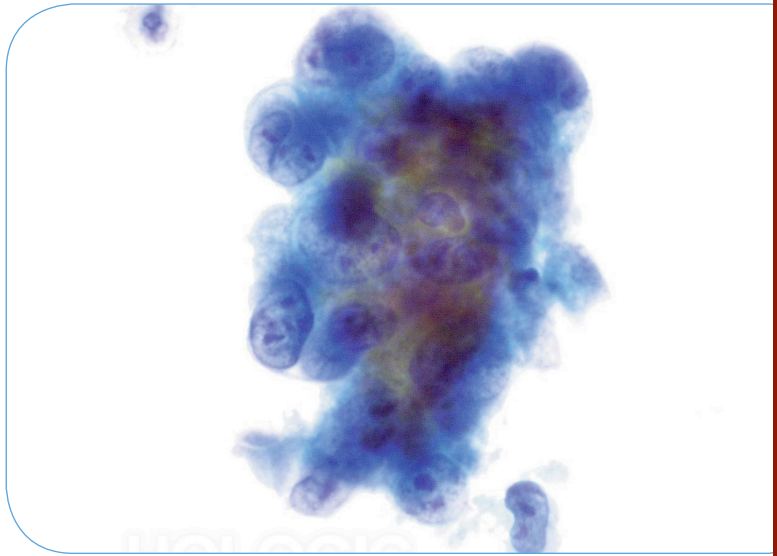
60 X



### N/C Ratio

Nuclei are enlarged, often occupying more than 2/3 of the cytoplasm and generally remain round to oval with undulating nuclear membranes.

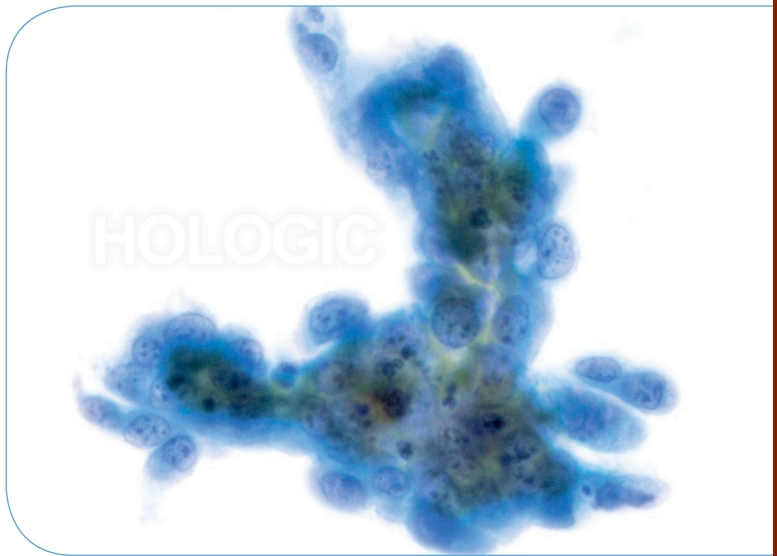
60 X



### Nucleus

Nuclei are enlarged and round to oval in shape

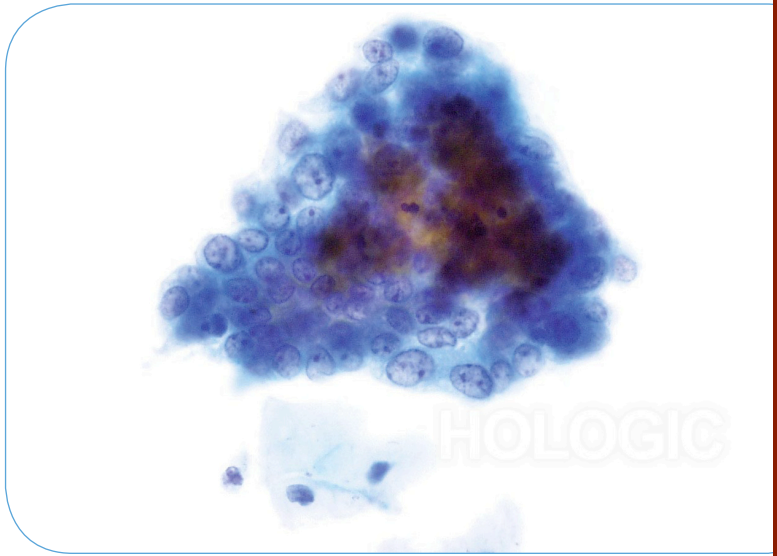
40 X



### Nuclear Membrane

Nuclear membranes are thickened and nuclear membrane irregularities are undulating as opposed to the rat bite membranes seen in squamous lesions.

40 X











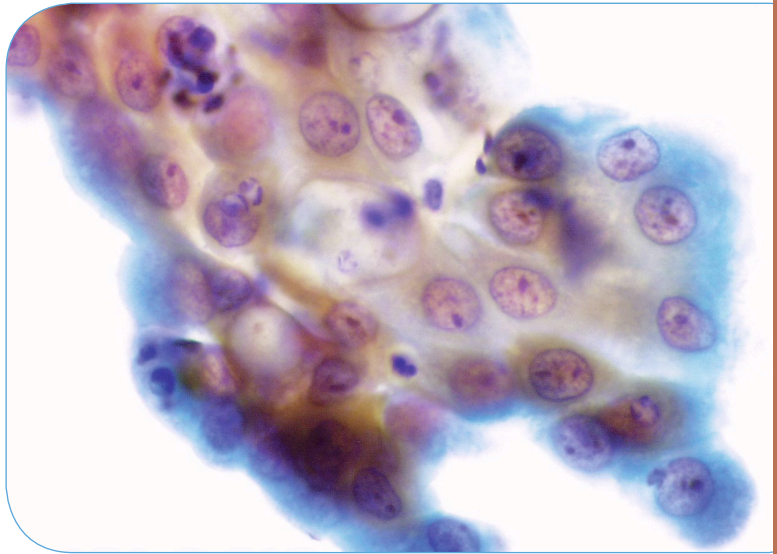






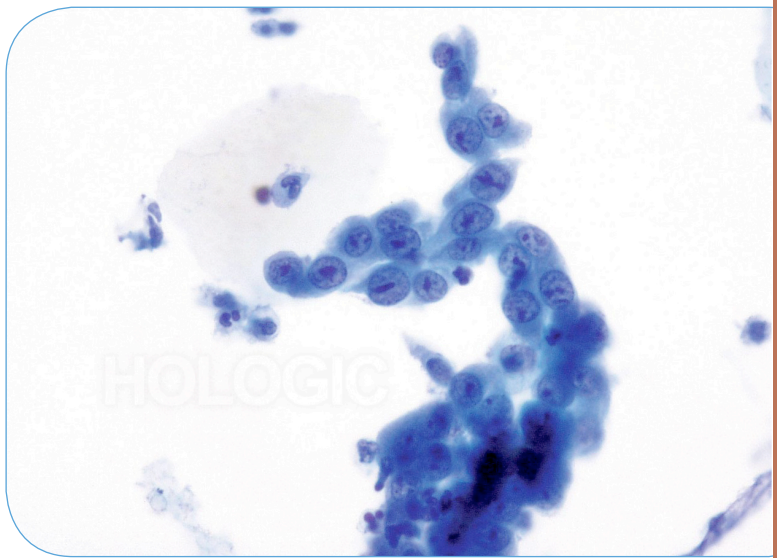
Repair shows smooth nuclear contours and polarity is maintained within group.

( 2 of 4 ) 60 X



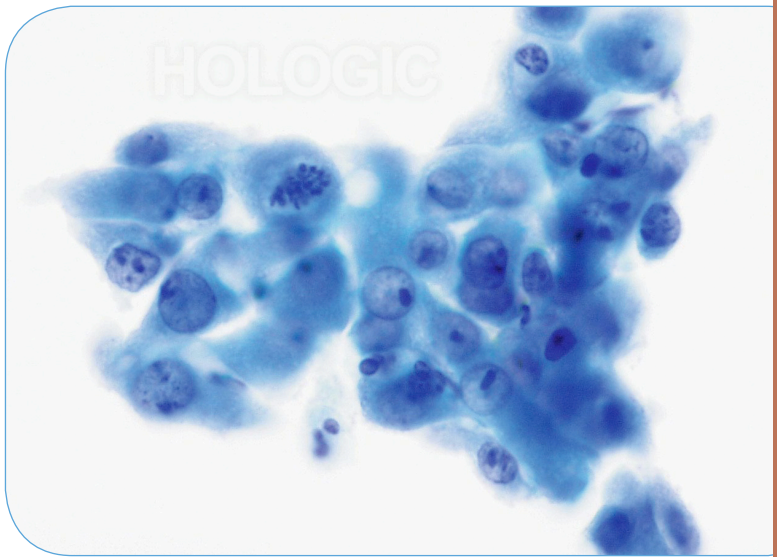
Repair can present with prominent nucleoli, some multiple.

( 3 of 4 ) 40 X



Repair may contain mitosis and macronucleoli.

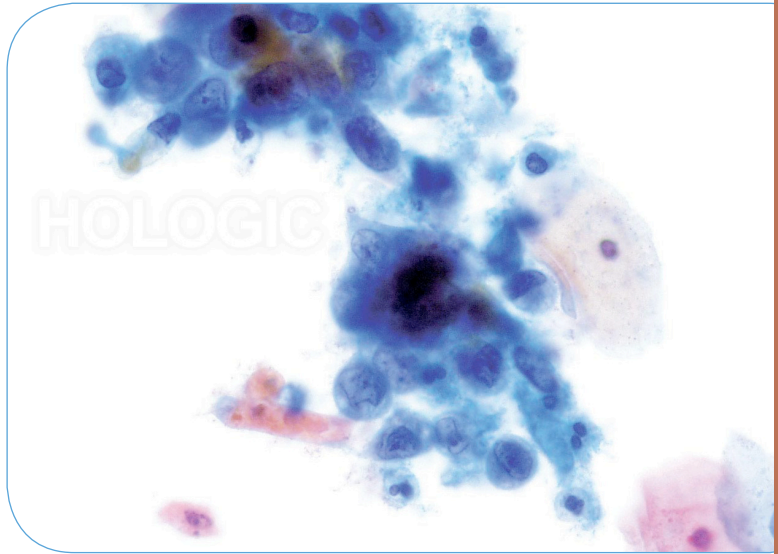
( 4 of 4 ) 60 X



**Tissue Presentation**

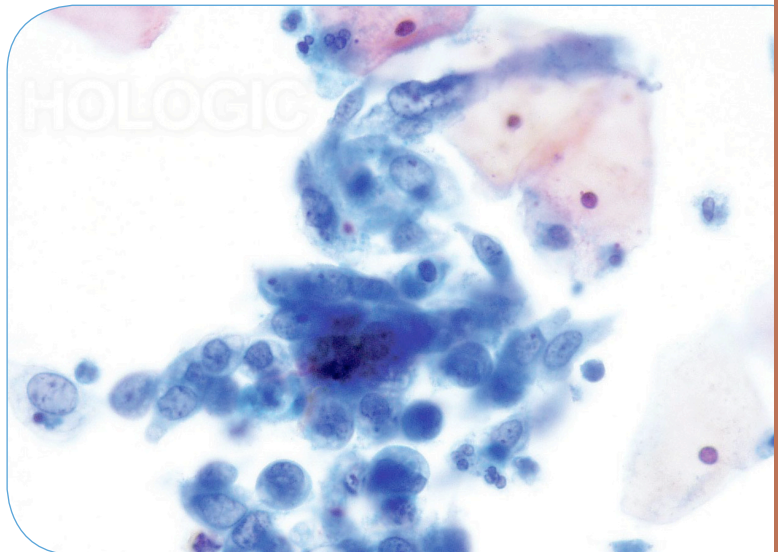
Cells are in syncytia, small dyshesive groups and single.

(1 of 2) 40 X



Dyshesive sheet of malignant squamous cells. Note the vacuoles which may confuse the diagnosis.

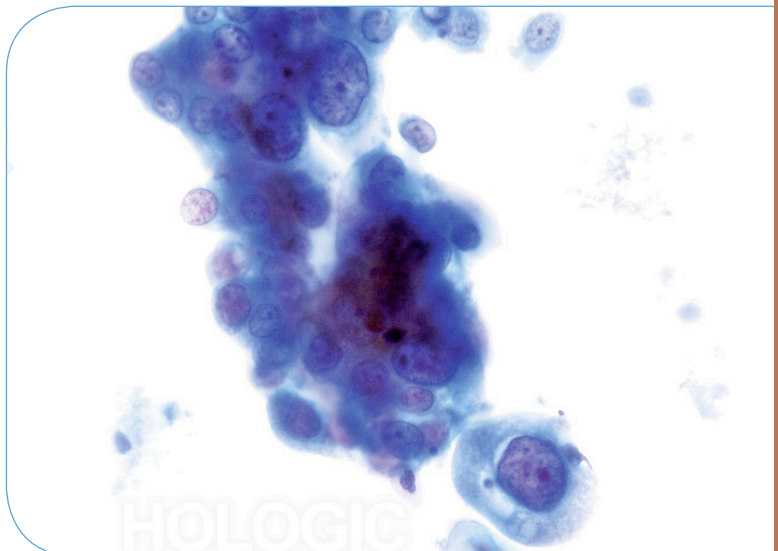
(2 of 2) 40 X



**Cytoplasm**

Cytoplasm is cyanophilic and can appear densely vacuolated.

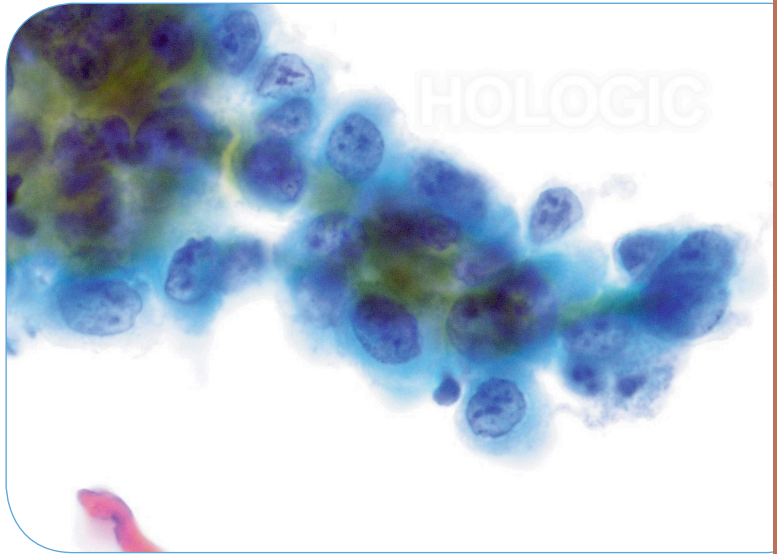
40 X





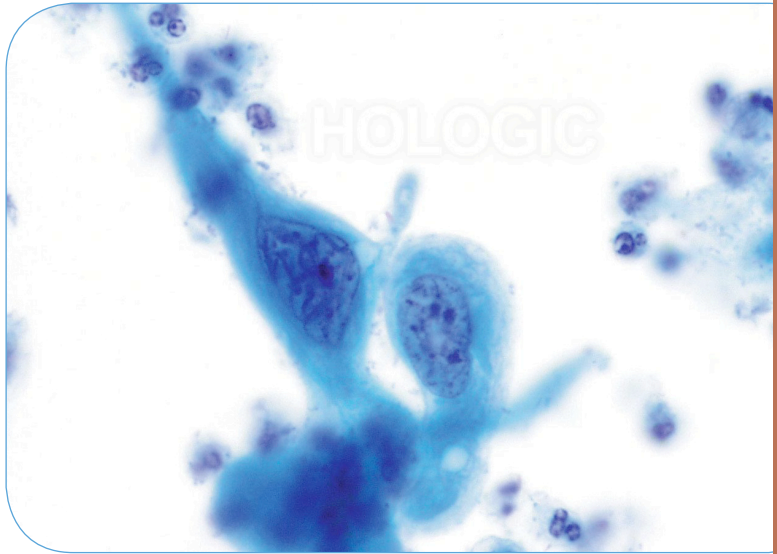
**Nuclear Membrane**  
Nuclear membranes show prominent irregularities

60 X



**Chromatin**  
Chromatin is coarse and unevenly distributed (parachromatin clearing).

60 X



**Nucleoli**  
Macronucleoli may be present.

60 X

