

Case Examples of Fine Needle Aspiration (FNA) Biopsy with or without Ultrasound (US) guidance at Stony Brook University Hospital

Case #1

An elderly female with history of Endometrial Adenocarcinoma, S/P total hysterectomy and bilateral salpingo-oophorectomy was referred to have US-guided FNA biopsy of her left supraclavicular mass/node. The procedure was performed by a Cytopathologist with immediate cytological evaluation onsite and communication of the preliminary diagnosis to the referring physician within less than one hour. The final report was issued as follows within 24 hours after the procedure.

DIAGNOSIS:

Lymph node/mass, left supraclavicular/level V, US-FNA:

- Positive for metastatic adenocarcinoma with clear cell and papillary features

MICROSCOPIC FINDINGS:

Sample comprised of clusters of moderately to poorly differentiated adenocarcinoma with occasional clear cells and some papillary features (Figures 1-4). Virtually no lymphoid component noted. Case was compared with the patient's previous uterine cancer slides (Figure 5). The current tumors share similar cytomorphology as the primary uterine tumor.

IMMEDIATE ASSESSMENT:

Five air-dried Diff-Quik stained smears were examined by light microscopy.

1st pass: Limited sample.

2nd pass: Adequate.

Preliminary impression: Positive for poorly differentiated carcinoma.

Onsite action: The finding was discussed with the patient and referring physician 20 minutes after the procedure.

PROCEDURE NOTE:

A patient with a history of endometrial adenocarcinoma with clear cell and papillary features was referred to have an US-guided FNA biopsy of a recently identified mass in the left lower neck. The patient was fully consented to the procedure. The left lower neck was evaluated by ultrasound, identifying a well-defined complex-echoic mass/node at the left supraclavicular region/level V that measured approximately 3x2.5 cm on a transverse image. US-guided FNA of the mass/node was performed after site identification and appropriate skin preparation. Two passes were performed using 27-gauge needles. US photographic documentation for needle localization was taken (Figure 6). A total of approximately 0.1cc bloody material was obtained. A total of 4 smears were made. The remaining material was saved in 10 cc RPMI medium for subsequent cell block preparation. The patient tolerated the procedure with minimal discomfort and no complications.

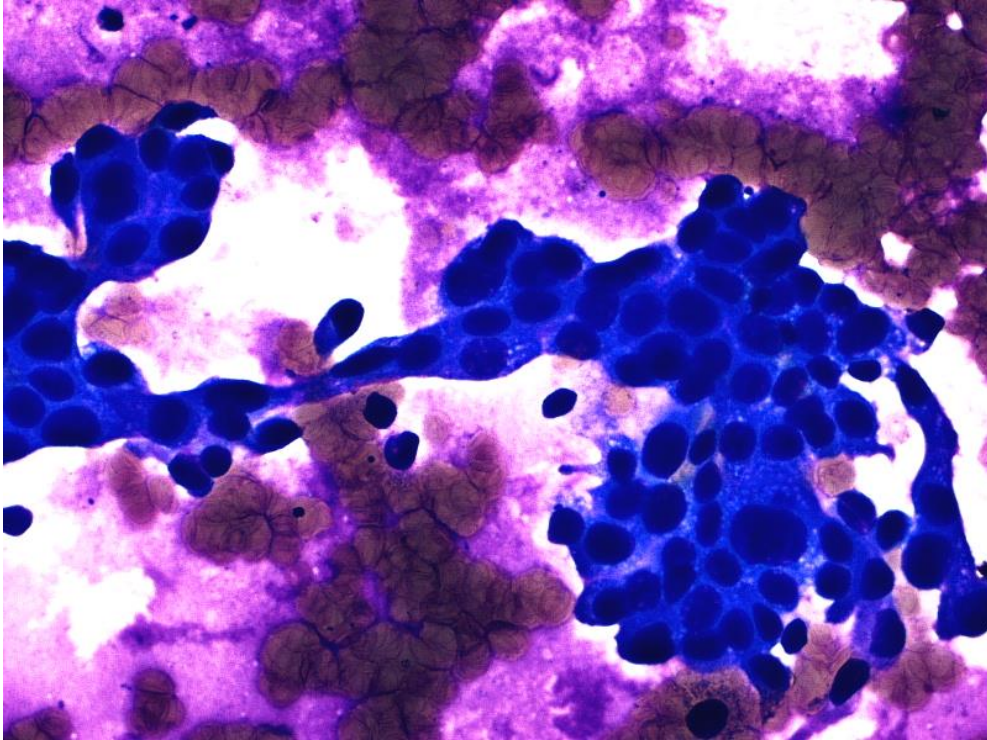


Fig. 1. Smear with Diff-Quik stain showing tumor fragment

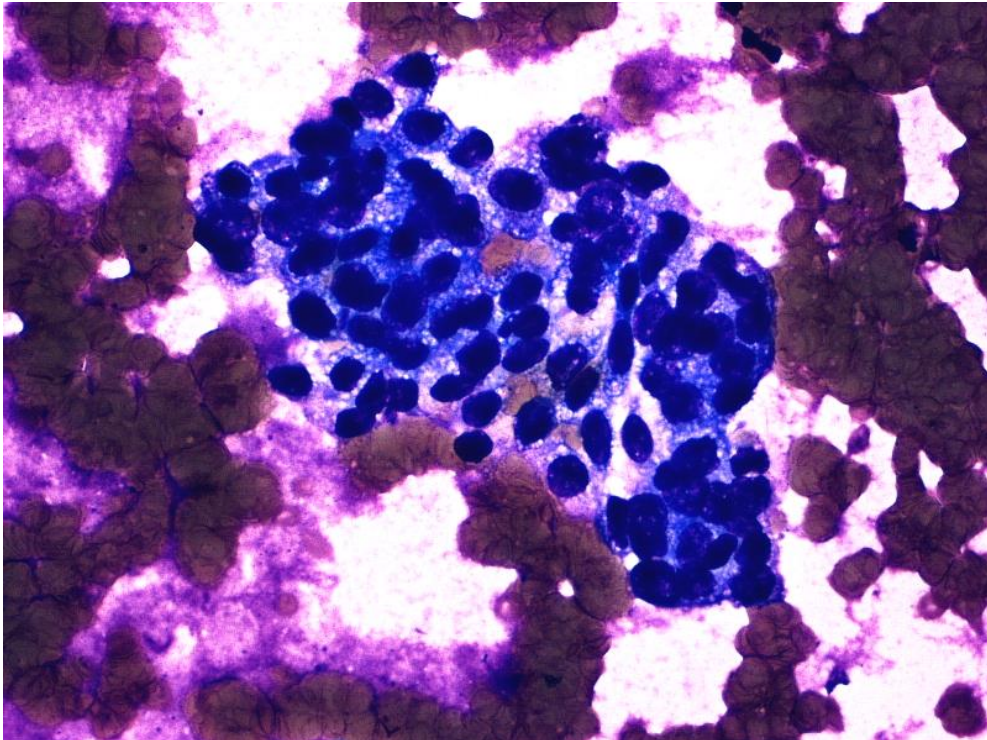


Fig. 2. Smear with Diff-Quik stain showing clear cytoplasm

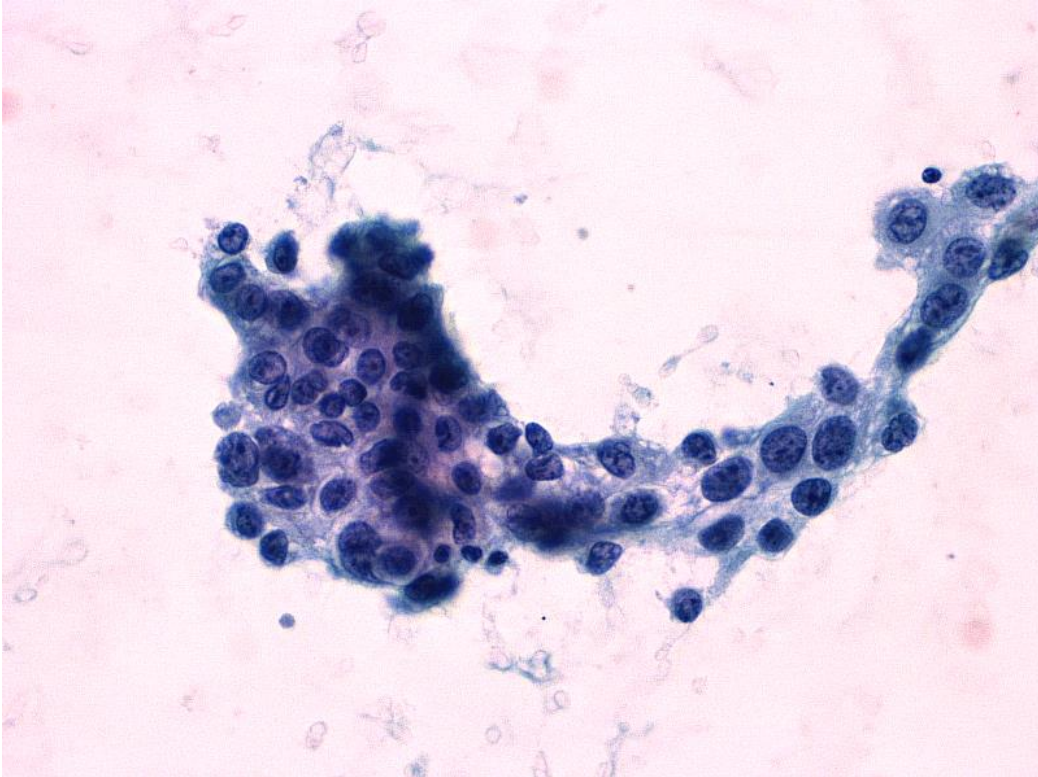


Fig. 3. Smear with Papanicolaou stain showing tumor fragment

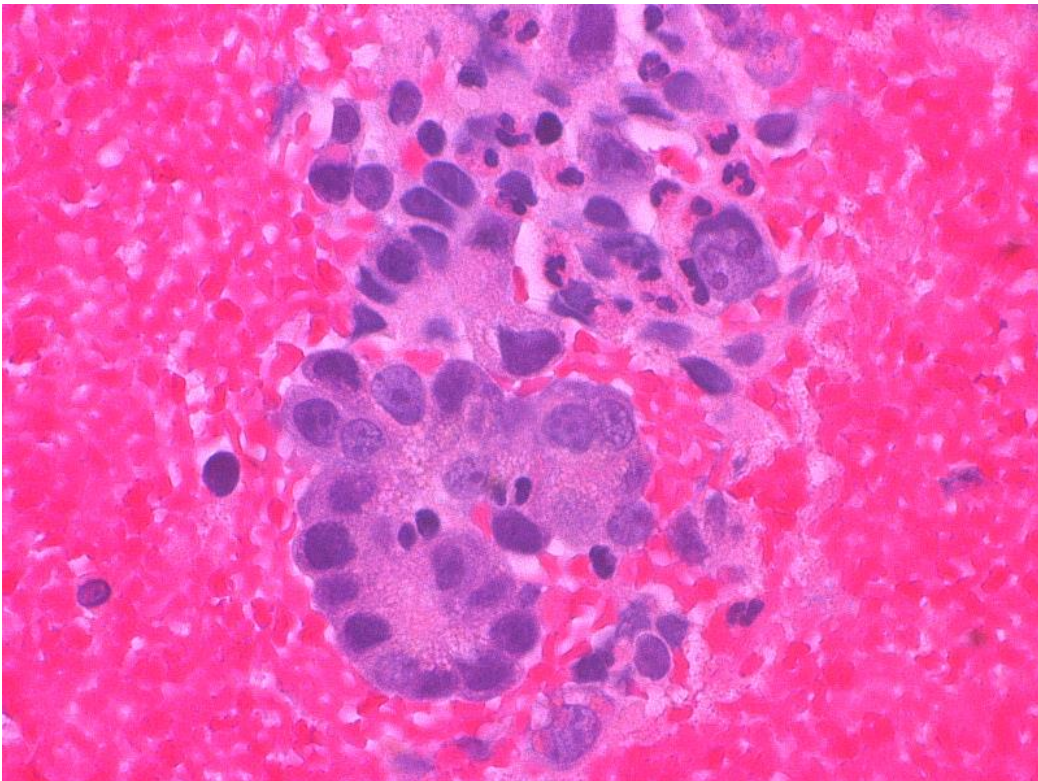


Fig. 4. Cell Block with H&E stain showing glandular pattern

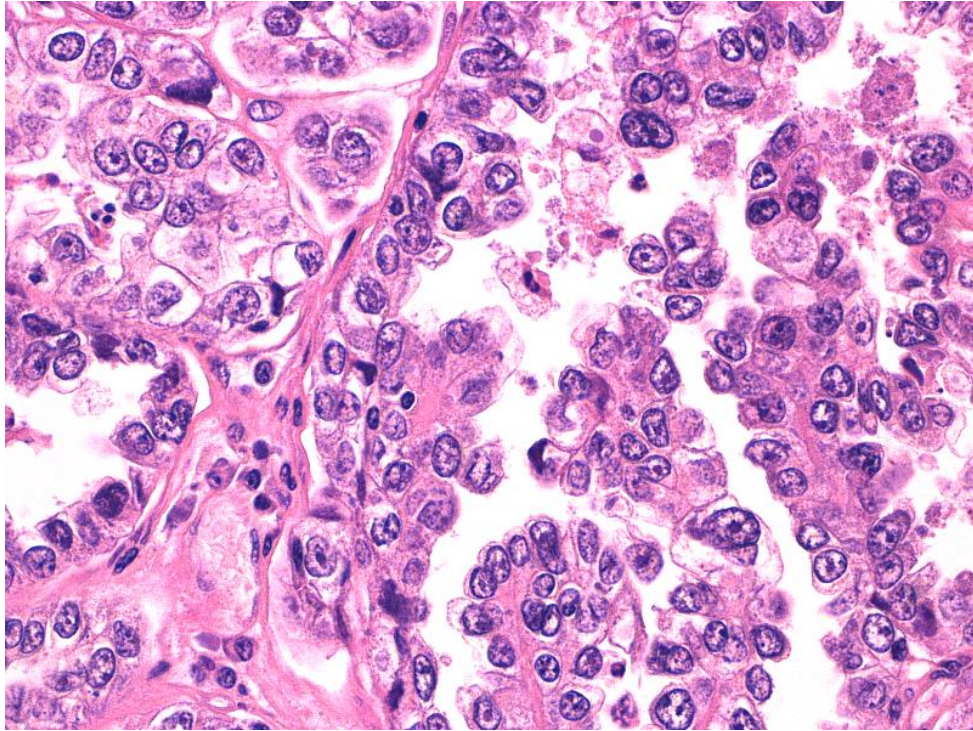


Fig. 5. Surgical pathology tissue section showing patient's previous endometrial adenocarcinoma

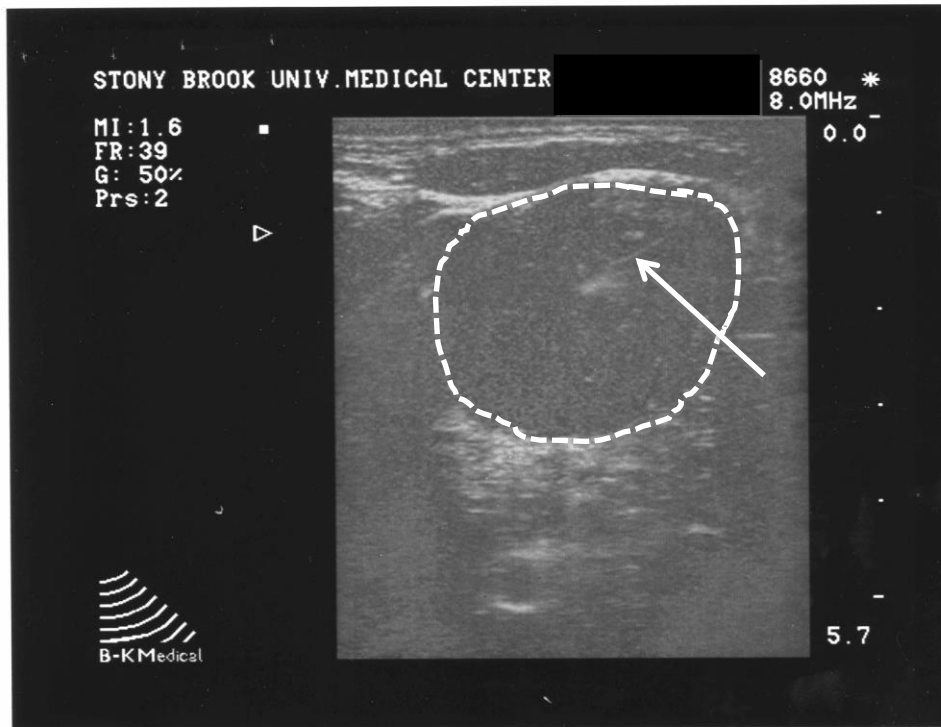


Fig. 6. US-FNA of left supraclavicular node/mass performed with a 27-gauge needle. Note needle location within the mass (arrow).

Case #2

A middle-aged female with a history of focally invasive rectal squamous cell carcinoma presented with a firm palpable right inguinal node was referred to have palpation-guided FNA biopsy. The procedure was performed by a Cytopathologist with immediate cytological evaluation onsite and communication of the preliminary diagnosis to the referring physician within less than one hour. The final report was issued as follows within 24 hours after the procedure.

DIAGNOSIS:

Lymph node, right inguinal, FNA:

- Positive for metastatic squamous cell carcinoma

MICROSCOPIC FINDINGS:

Sample comprised of numerous well to moderately differentiated keratinizing squamous cells (Fig. 1 and Fig. 2). Virtually no lymphoid component was noted. Case was compared with the patient's previous rectal cancer slides. The current tumor cells share similar cytomorphology as the primary tumor.

IMMEDIATE ASSESSMENT:

Two air-dried Diff-Quik stained smears were examined by light microscopy.

1st pass: Adequate.

Preliminary impression: Positive for metastatic squamous cell carcinoma.

Onsite action: The finding was discussed with the patient and referring physician.

PROCEDURE NOTE:

A patient with a history of rectal squamous cell carcinoma was referred to have a palpation-guided FNA biopsy of a recently identified PET positive right inguinal node. The patient was fully consented to the procedure. The node was firm and non-mobile and measured approximately 1.5cm. Palpation-guided FNA of node was performed after site identification and appropriate skin preparation. One pass was performed using a 25-gauge needle. Scant grayish thick material was obtained. A total of 4 smears were made. The rest of material was saved in 10 cc RPMI medium for ThinPrep preparation. The patient tolerated the procedure with minimal discomfort and no complications.

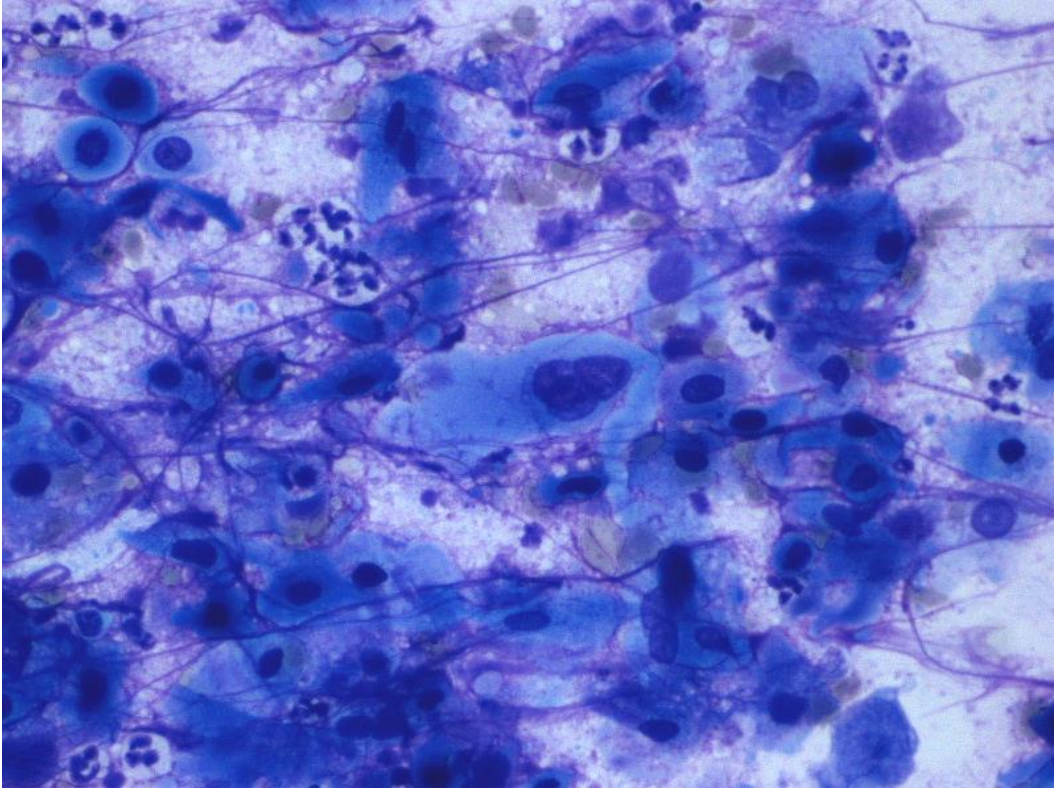


Fig. 1. Diff Quik Stained smear showing malignant squamous cells

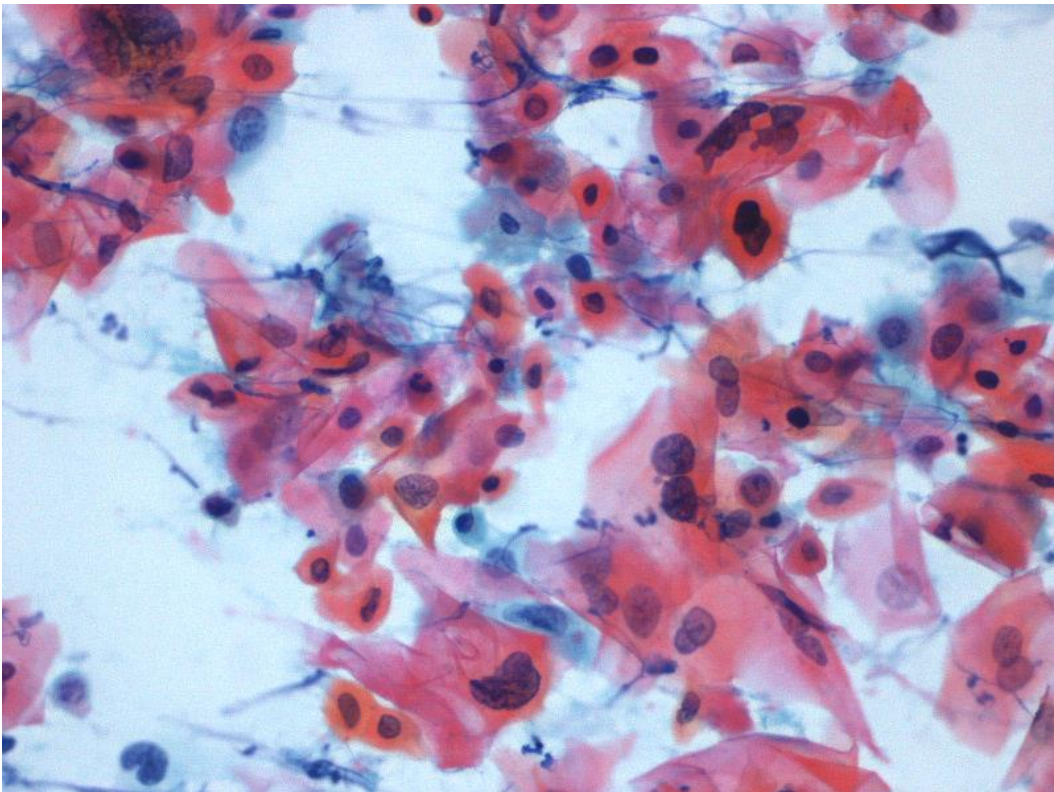


Fig. 2. Papanicolaou stained smear showing malignant squamous cells

Case #3

An elderly female with a history of breast cancer presented with left supraclavicular node/mass was referred to have US-guided FNA biopsy. The procedure was performed by a Cytopathologist with immediate cytological evaluation onsite and communication of the preliminary diagnosis to the referring physician within less than one hour. The final report was issued as follows within 24 hours after the procedure.

DIAGNOSIS:

Lymph node, left supraclavicular, US-FNA:

- **Positive for metastatic adenocarcinoma (see note)**

Note: ER, PR and Her-2 immuno stains pending and an addendum report to follow.

MICROSCOPIC FINDINGS:

Sample comprised of clusters of well- to moderately-differentiated adenocarcinoma (see representative Figs. (1-3). Smears show plenty tumor cells. A Cell block slide reveals more than 100 tumor cells. Some lymphoid cells are also noted.

IMMEDIATE ASSESSMENT:

Two air-dried Diff-Quik stained smears were examined by light microscopy.

1st pass: Limited sample.

2nd pass: Adequate.

Preliminary impression: Positive for metastatic carcinoma.

Onsite action: The finding was discussed with the patient and referring physician on 10/16/2014, 2:50pm.

PROCEDURE NOTE:

A patient with a history of left breast adenocarcinoma and multiple lung nodules was referred to have a US-guided FNA biopsy of a previously needle biopsied left supraclavicular node/mass for breast marker studies. The patient was fully consented to the procedure. The left lower neck was evaluated by ultrasound, identifying ill-defined complex-echoic mass/node at the left supraclavicular region that measured approximately 3x2.5 cm on a transverse image. US-guided FNA of the mass/node was performed after site identification and appropriate skin preparation. Two passes were performed using 25-gauge needles. US photographic documentation for needle localization was taken (Fig. 4). A total of approximately 0.1cc bloody material was obtained. A total of 5 smears were made. Remaining material was saved in 10 cc RPMI medium for subsequent cell block preparation. The patient tolerated the procedure with minimal discomfort and no complications.

ADDENDUM:

ER: Moderate to strongly positive staining in approximately 80-90% tumor cells (Fig. 5).

PR: Weak to moderately positive staining in approximately 50-60% tumor cells (Fig. 6).

Her-2 immuno stain: 1-2+ (Fig.7) FISH pending.

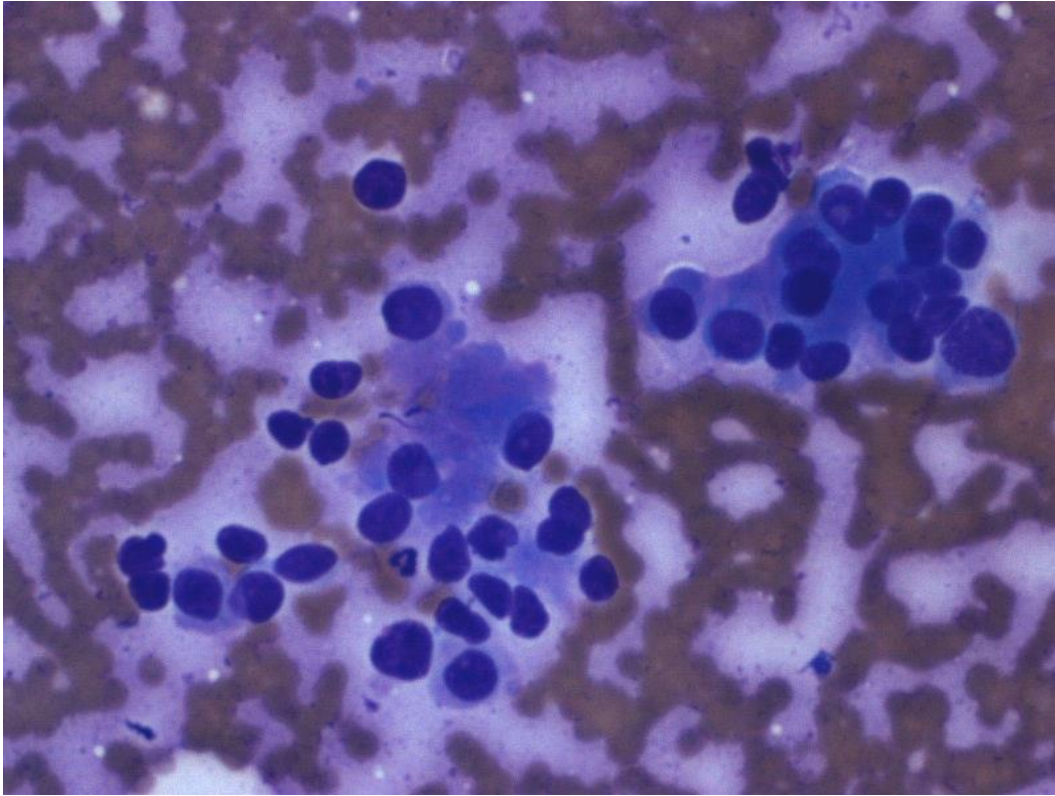


Fig. 1. Diff Quik stain of malignant cells



Fig. 2. Pap stain of malignant cells

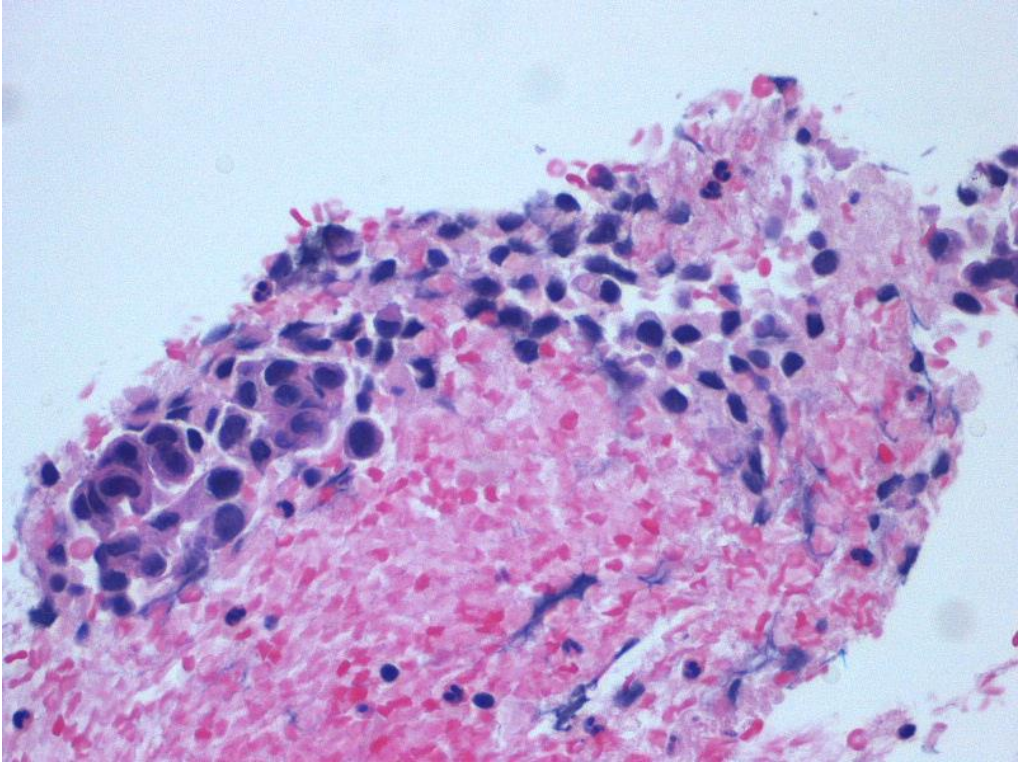


Fig. 3. H&E stain of Cell Block sample

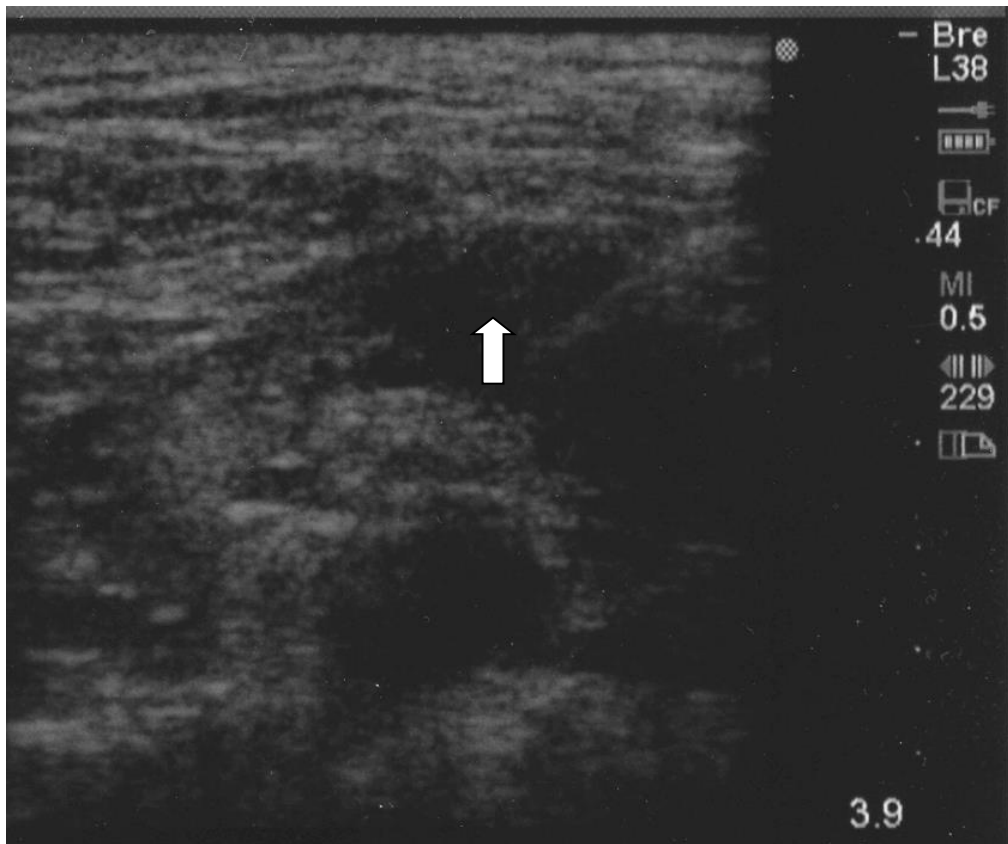


Fig. 4. US image shows an ill-defined mixed echoic mass (Arrow: needle)

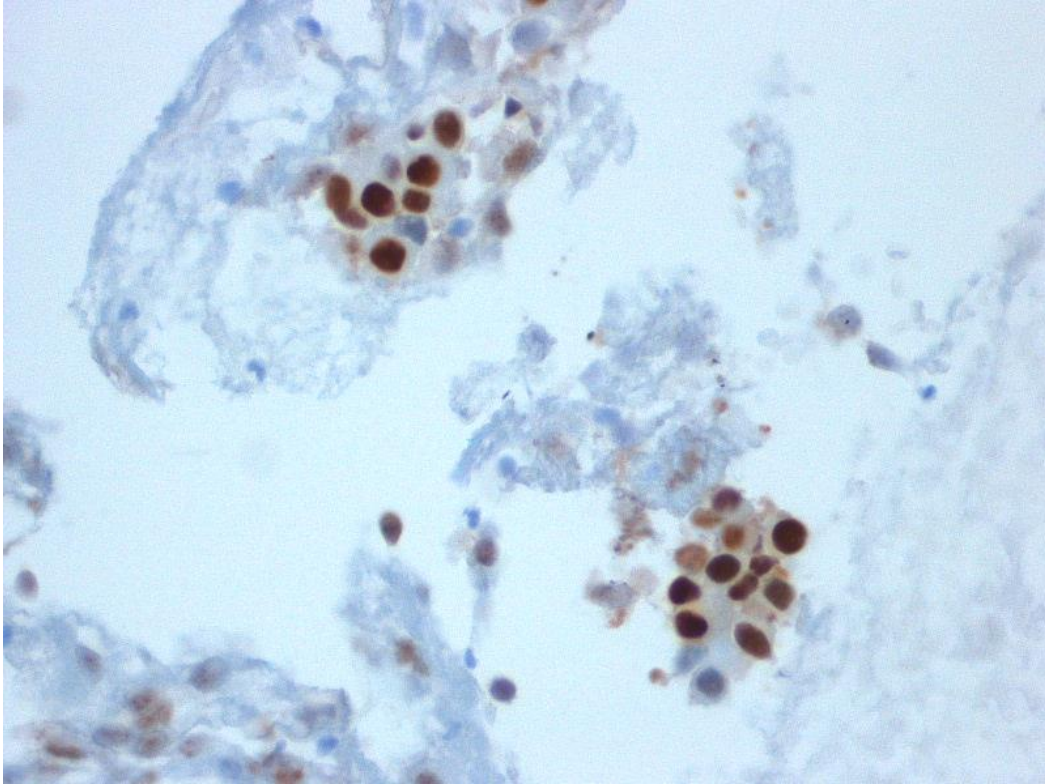


Fig. 5. ER immuno stain from Cell Block

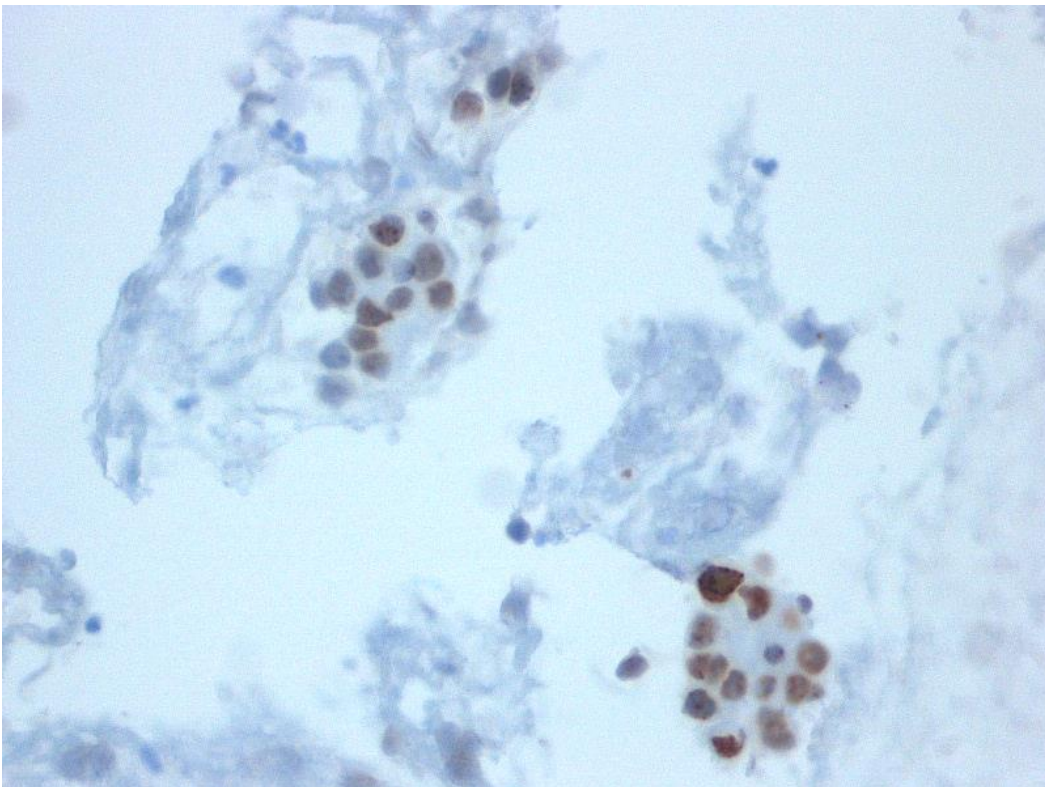


Fig. 6. PR immuno stain from Cell Block

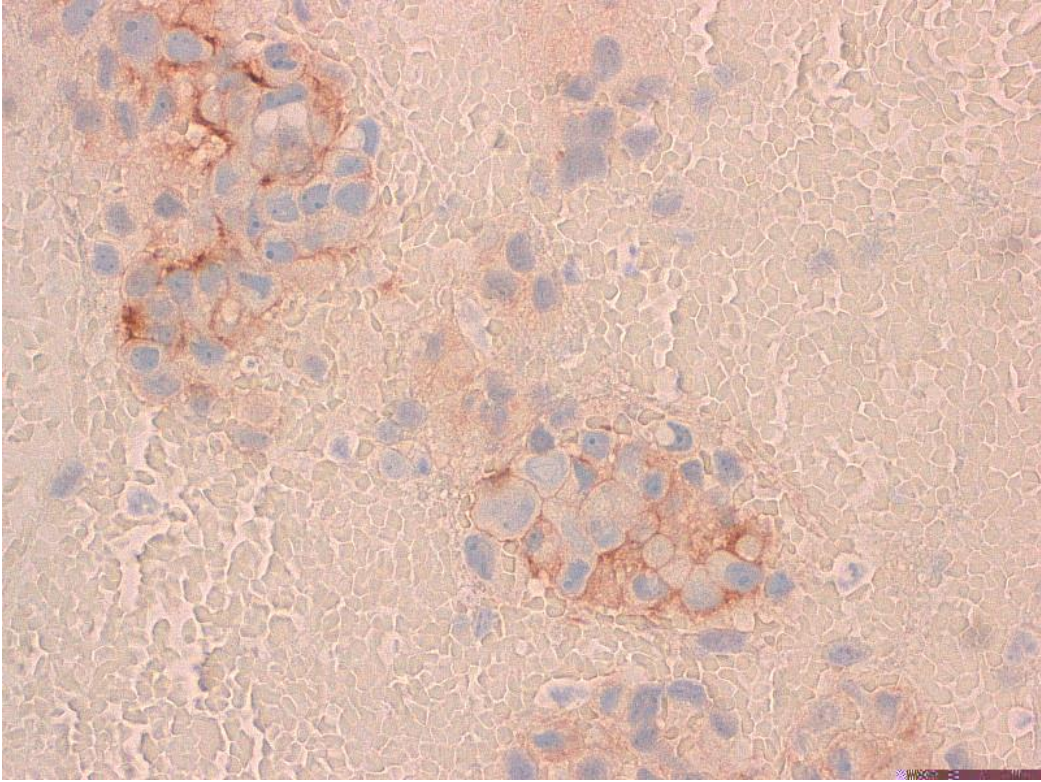


Fig. 7. Her-2-neu immuno stain show 1-2+ staining

Case #4

An elderly woman with a large mass in the left breast was referred for palpation-guided FNA biopsy. She was diagnosed invasive ductal carcinoma three years prior however she refused surgery and the mass has since grown. The referring physician suspected that the nature of the tumor might have changed thus requested for FNA biopsy for tumor marker studies.

DIAGNOSIS:

Breast mass, left, 3-4 o'clock, FNA:

- Consistent with mammary adenocarcinoma, predominantly with ductal features and some cells suggestive of lobular features (see note)

Note: ER, PR, Ki67, Her-2 and E-Cadherin immuno stains pending. Addendum report to follow.

MICROSCOPIC FINDINGS:

Smears and cell block comprised of scattered groups and rows of uniform population of malignant cells (Fig. 1-3). Case was compared with the patient's previous biopsy slides. The current tumor cells share similar cytomorphology as the primary tumor.

IMMEDIATE ASSESSMENT:

The Fine Needle Aspirations were performed by two cytopathologists. The aspirates were evaluated for adequacy at the time of the FNA procedure.

5 air-dried Diff-Quik stained smears were examined by light microscopy.

1st pass: Limited cellularity.

2nd pass: Adequate.

Preliminary impression: Positive for mammary adenocarcinoma

Onsite action: The finding was discussed with the patient and referring physician.

PROCEDURE NOTE:

A patient with a history of a large ulcerated left breast mass was referred to have a palpation-guided FNA biopsy. The patient was fully consented to the procedure. The mass was palpated to be firm and non-mobile and measured approximately 6x7cm grossly. Palpation guided FNA of the mass was performed after site identification and appropriate skin preparation. Two passes were performed using 27 and 23 gauge needles. Scant bloody material was obtained from each pass. A total of 10 smears were made. The remaining material was saved in 10cc RPMI medium for making cell block. The patient tolerated the procedure with minimal discomfort and no complications.

ADDENDUM:

The Immuno studies were performed on the cell block slides which showed greater than 100 cells/slide. All controls were appropriate.

ER and PR: Both Positive in 95% tumor cells (moderate to strong nuclear staining). (Fig. 4 and Fig. 5).

Ki-67 (proliferation index): Positive in approximately 50% tumor cells. Fig. 6).

E-Cadherin: Positive in larger tumor cells (90%, membranous); Negative in smaller tumor cells (10%). (Fig. 7).

Her-2-Neu: 2+ (FISH study to follow) (Fig. 8).

In summary, above profile is compatible with mammary carcinoma, predominantly ductal type with probable minor lobular component.

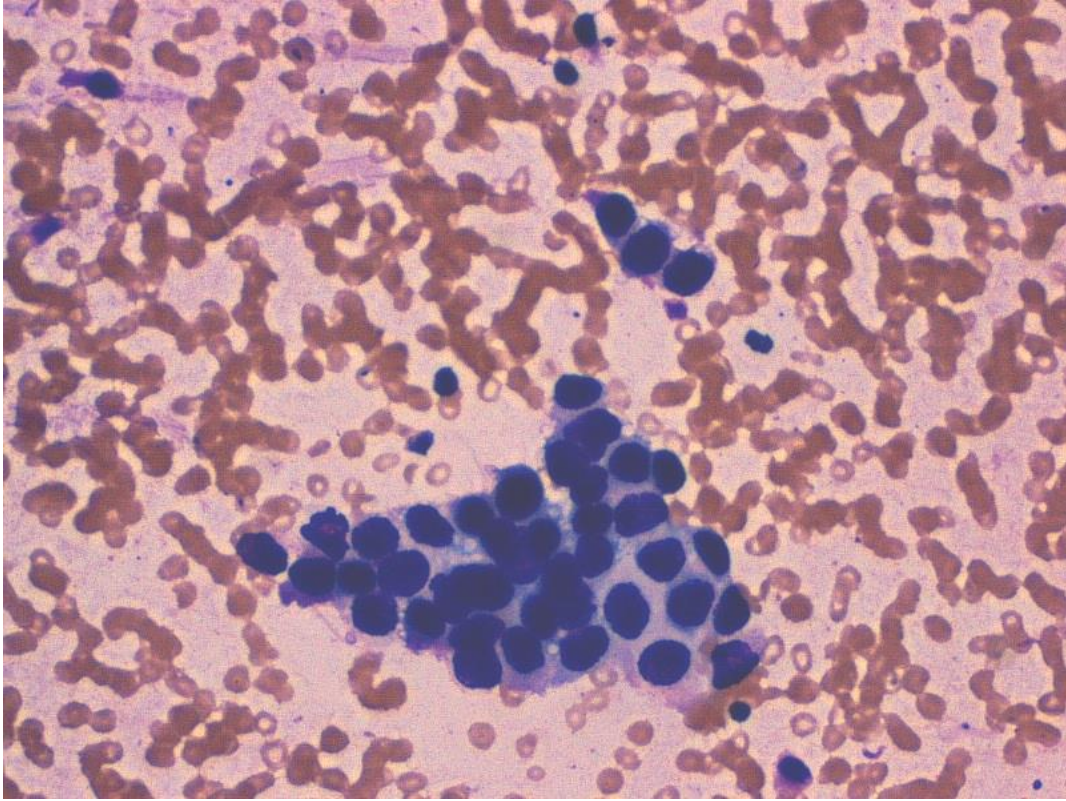


Fig. 1. Diff Quik stain of malignant cells

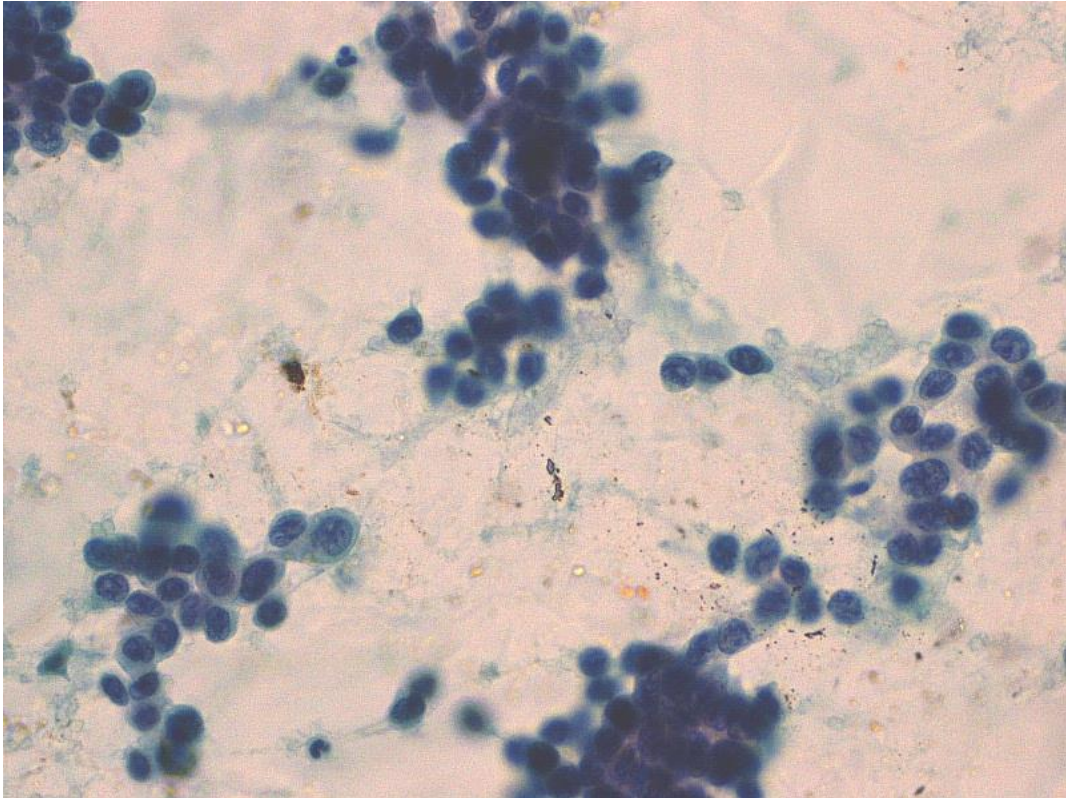


Fig. 2. Pap stain of malignant cells

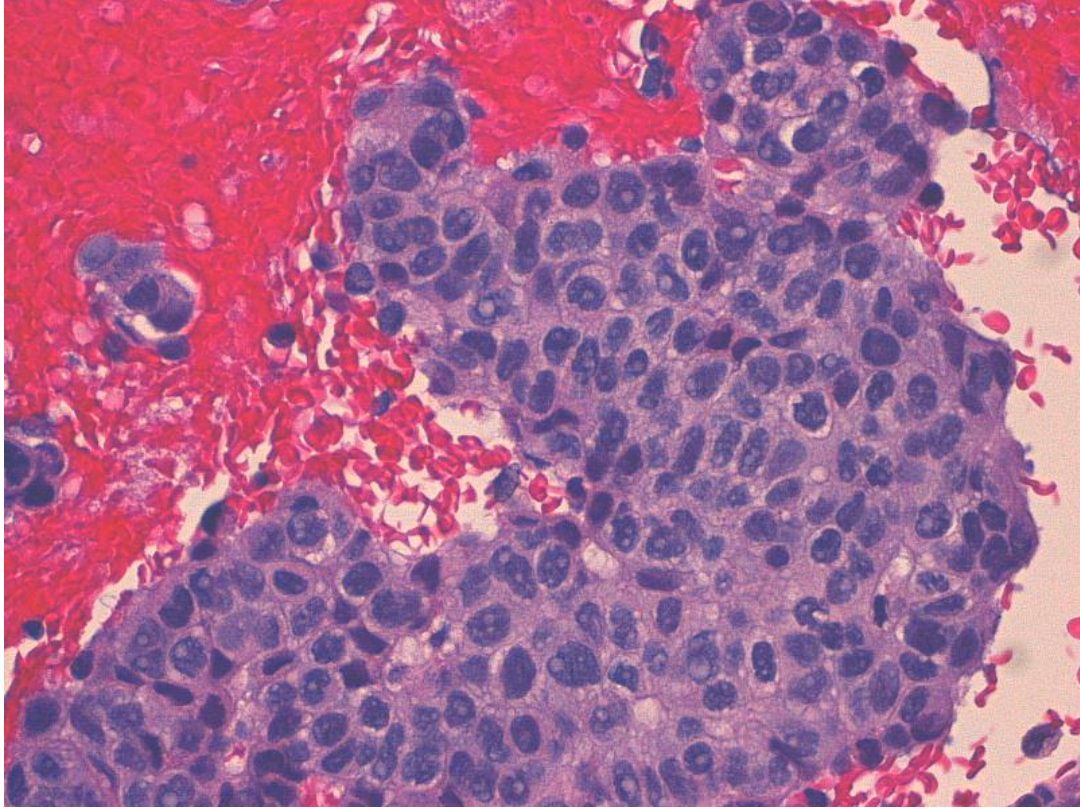


Fig. 3. H&E stain of Cell Block sample

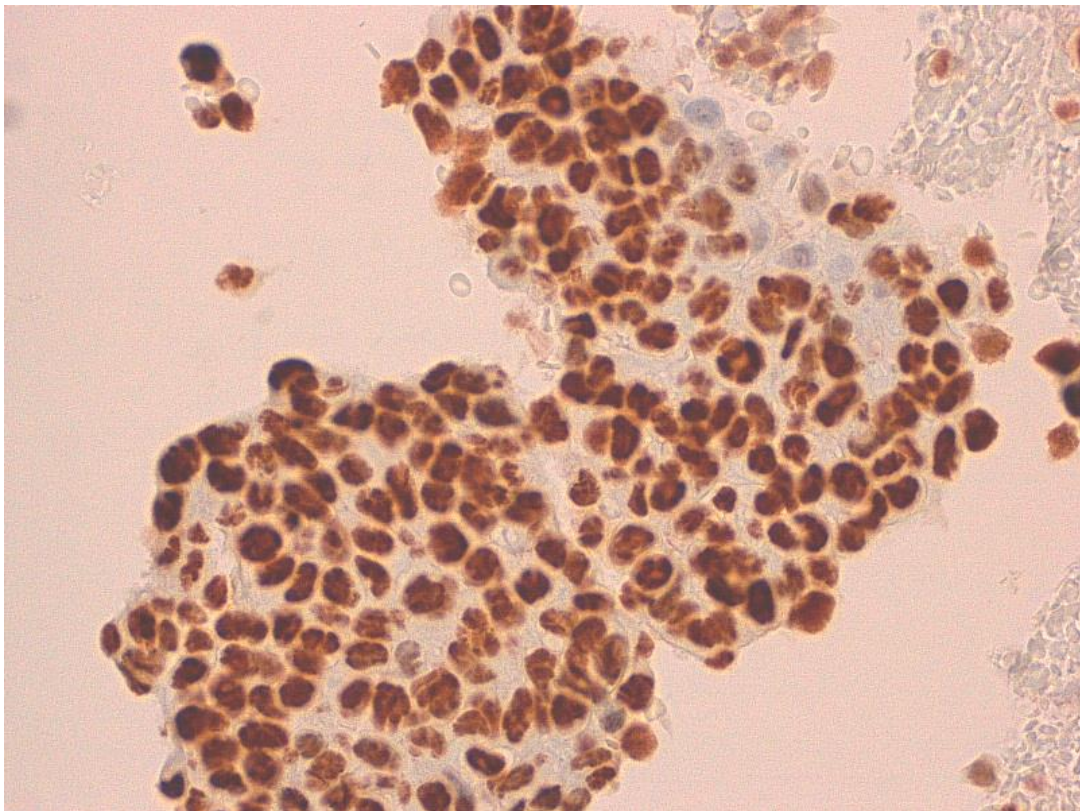


Fig. 4. ER immuno stain from Cell Block

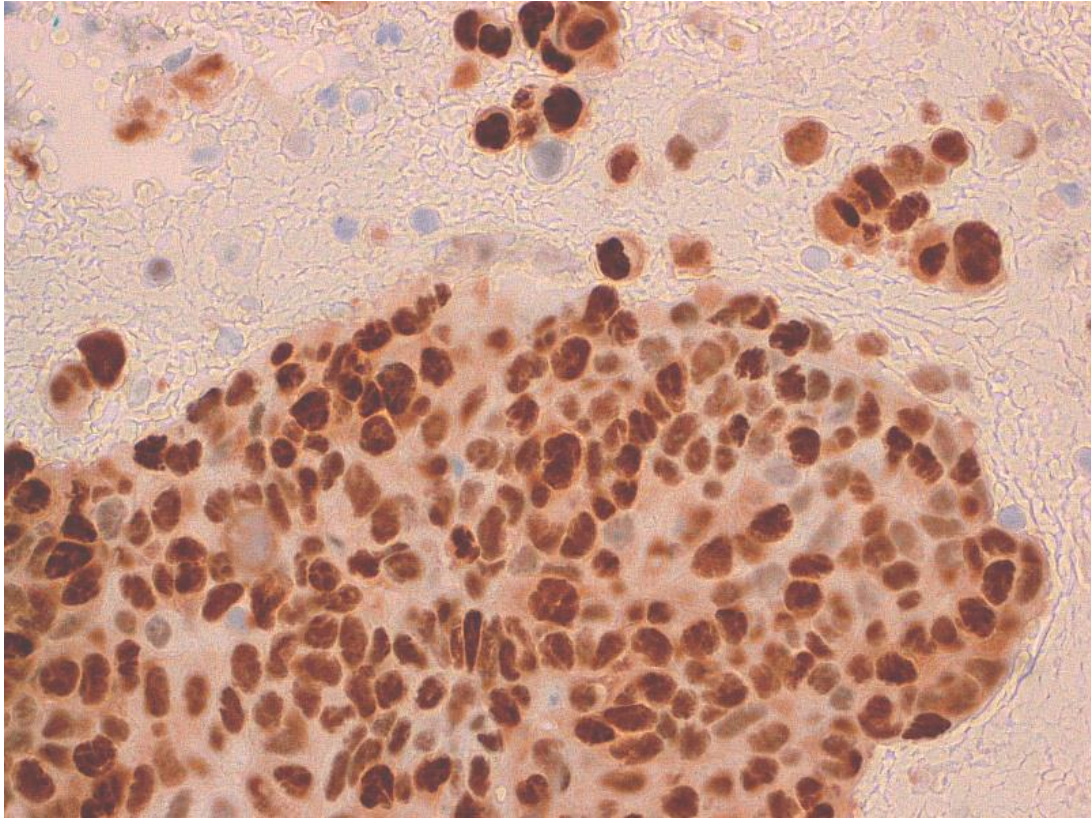


Fig. 5. PR immuno stain from Cell Block

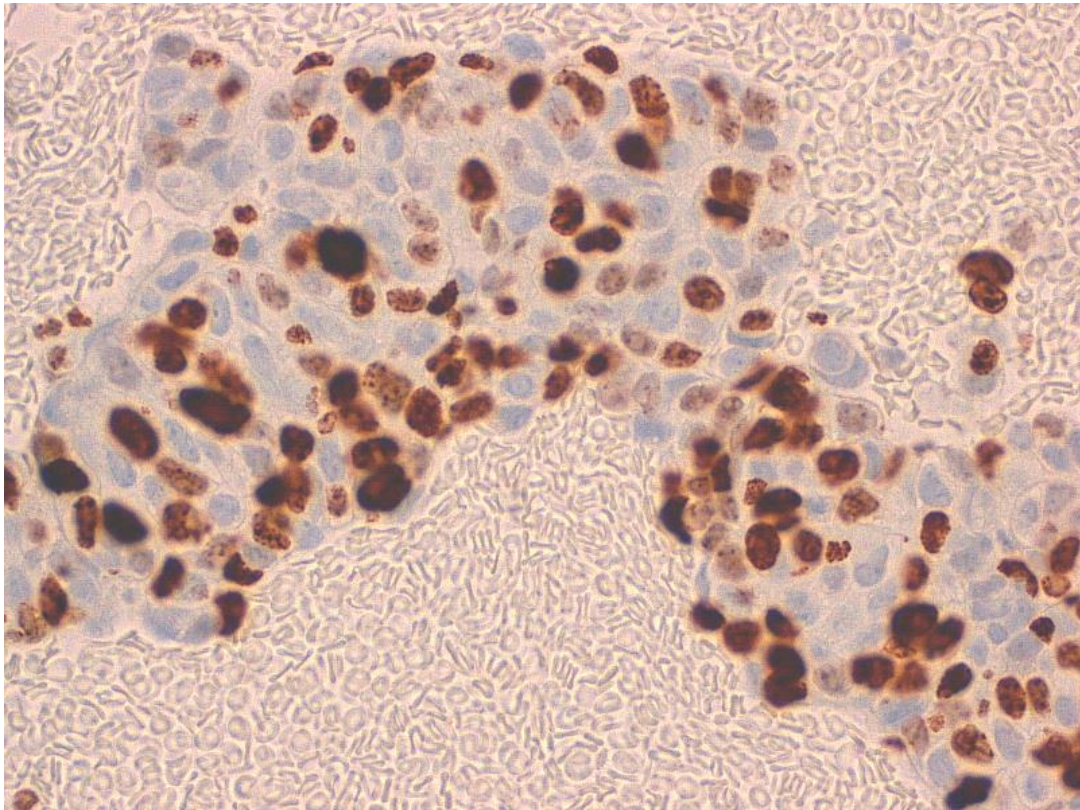


Fig. 6. Ki67 immuno stain from Cell Block

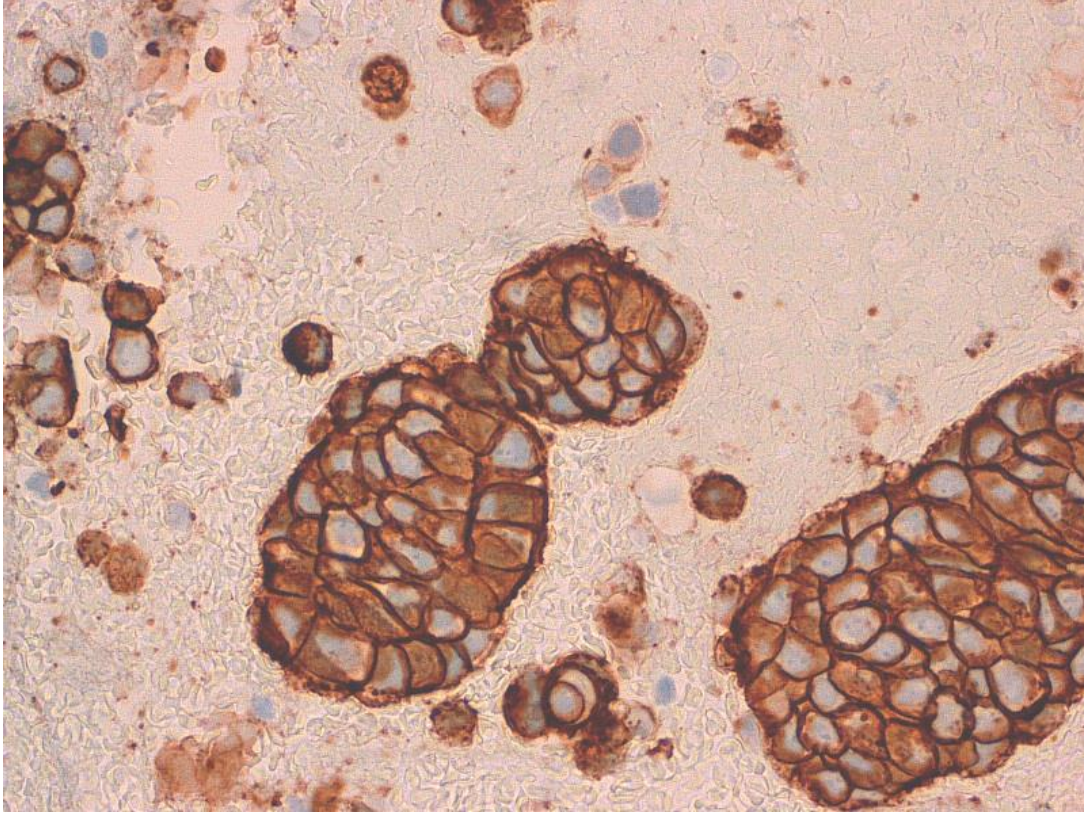


Fig. 7. E-Cadherin immuno stain from Cell Block

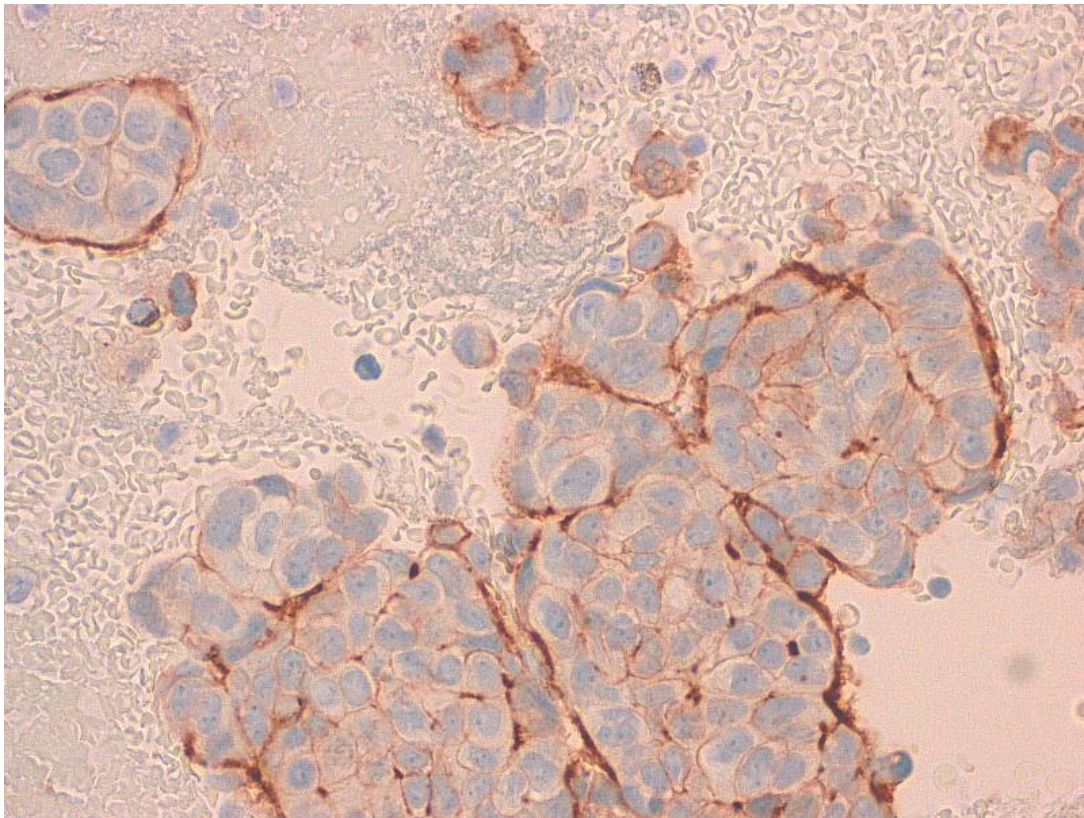


Fig. 8. Her-2-neu immuno stain from Cell Block