Rapid On-Site Evaluation
在胸腔科的應用

中國醫藥大學附設醫院 胸腔科

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Outline

1. 關於 ROSE
   - ROSE介紹/好處
   - 在胸腔內科的使用時機
   - ROSE的操作流程
2. 中國附醫的經驗
   - 研究數據分享
   - 臨床個案討論

ROSE介紹

1. Rapid On Site Evaluation
2. 誰可以做ROSE
   - 臨床細胞病理醫師
   - 臨床細胞醫檢師
   - 接受過細胞病理訓練的胸腔內科醫師

ROSE的好處

1. 可評估檢體是否好的標本

   ★ 代表性　★ 診斷價值

2. 依鏡檢時抹片背景及細胞型態學評估病兆

   ★ 良性　★ 惡性

3. 細胞量是否足夠

   ★ 明確診斷 ★ 再分類 ★ 分生檢測

在胸腔內科的使用時機

1. **Bronchoscopic Methods**
   a. Brushing
   b. Endobronchial Biopsy.
   c. Transbronchial Biopsy
   d. Transbronchial Needle Aspiration
   e. EBUS – TBNA (Mediastinal lymph node)
2. **Sono-guided FNA & Cutting Biopsy**
3. **Medical pleuroscopy Biopsy**

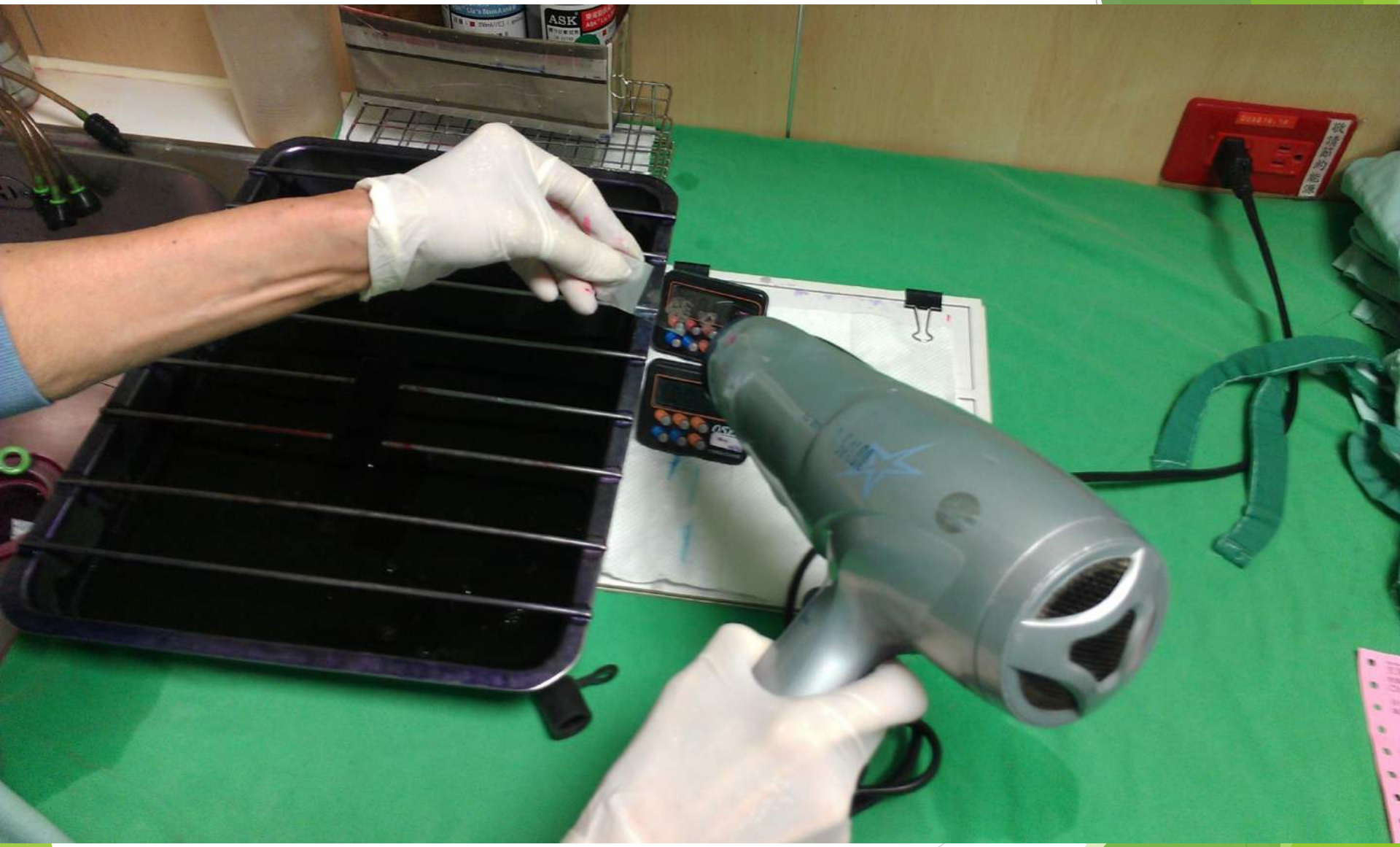
ROSE的操作流程(1/2)

設備需求

Requirement	
1	Liu’s stain kit (A & B) 染色液
2	計時器
3	吸球
4	染色盤
5	顯微鏡

ROSE的操作流程(2/2)

玻片處理步驟: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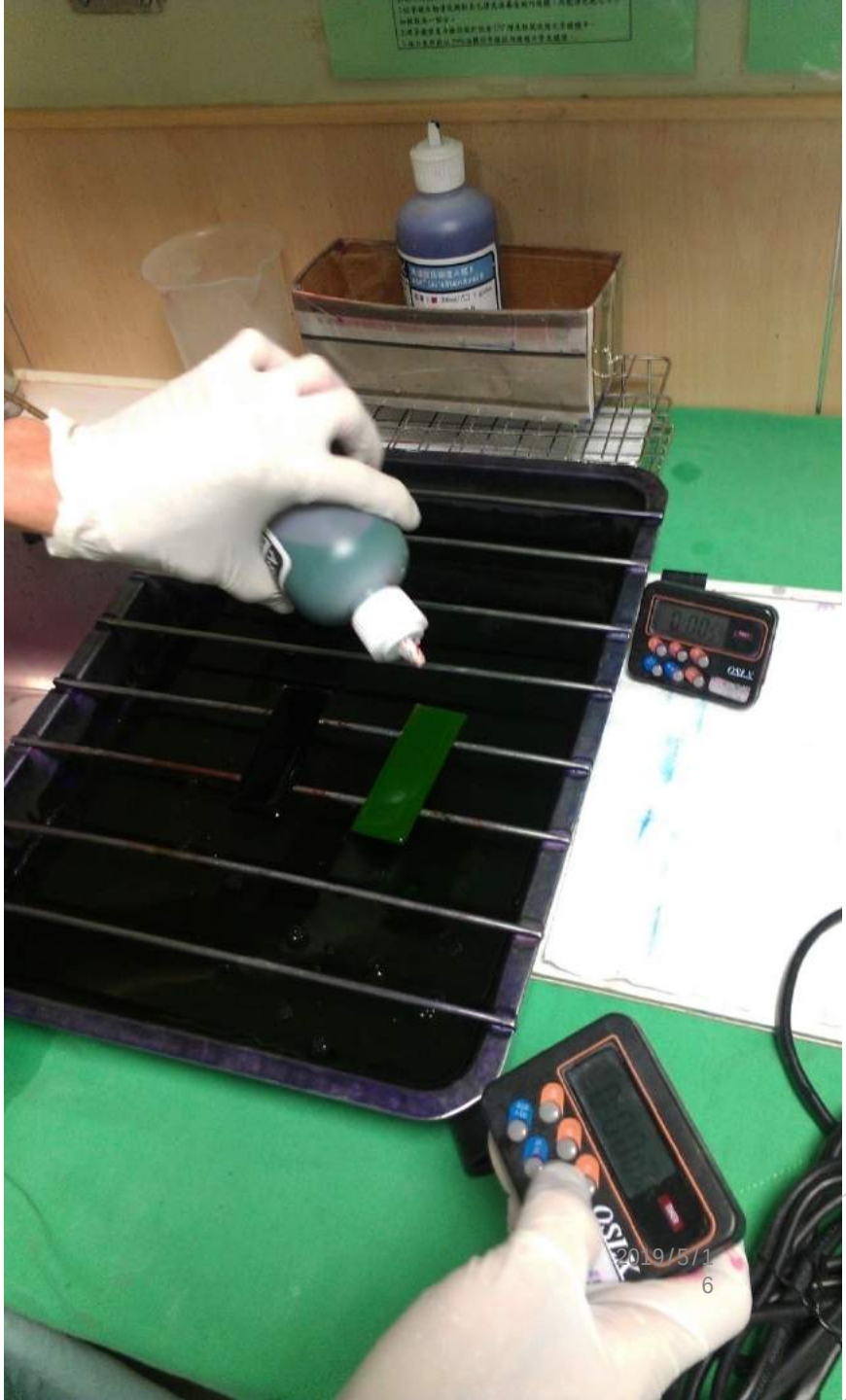

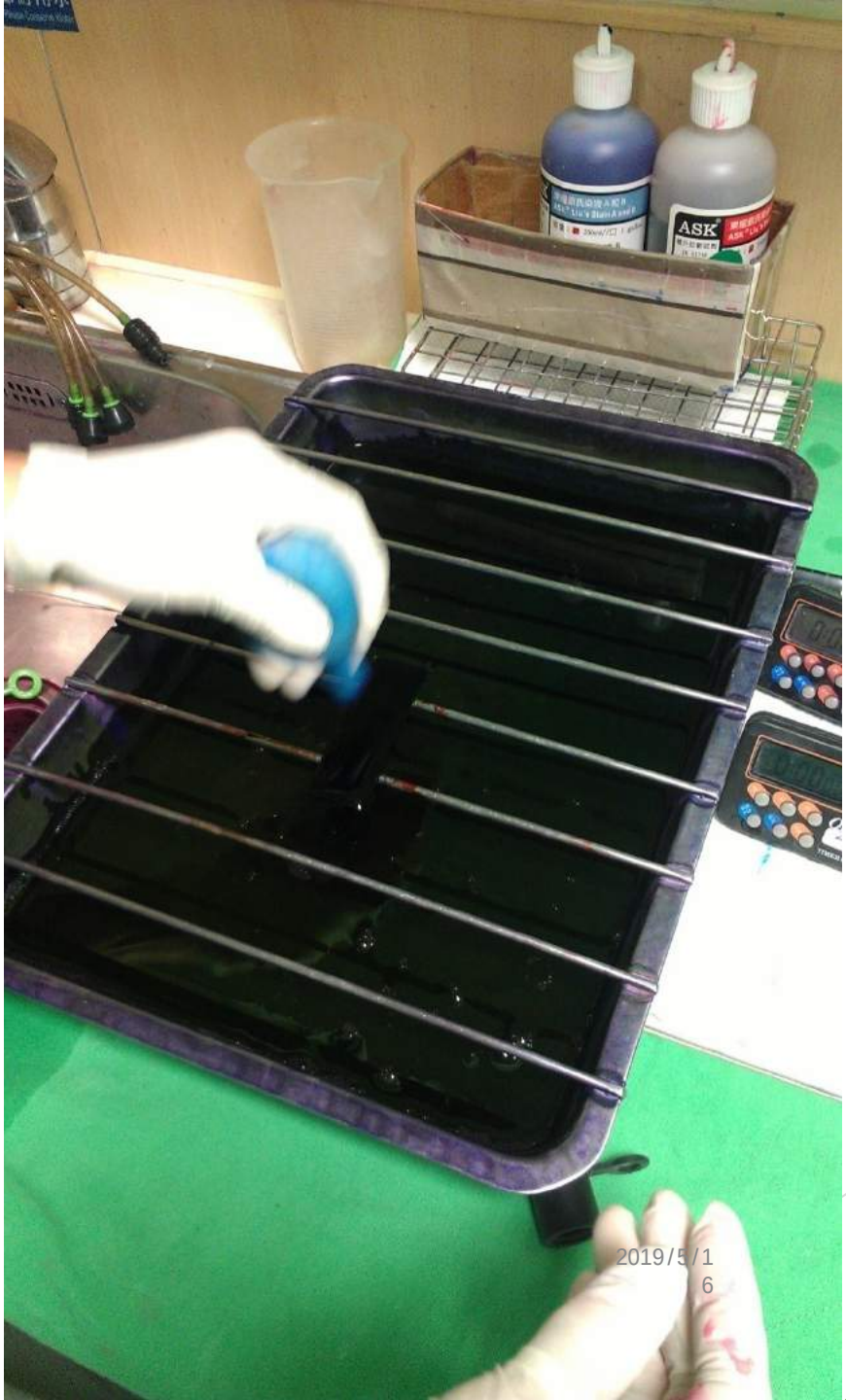
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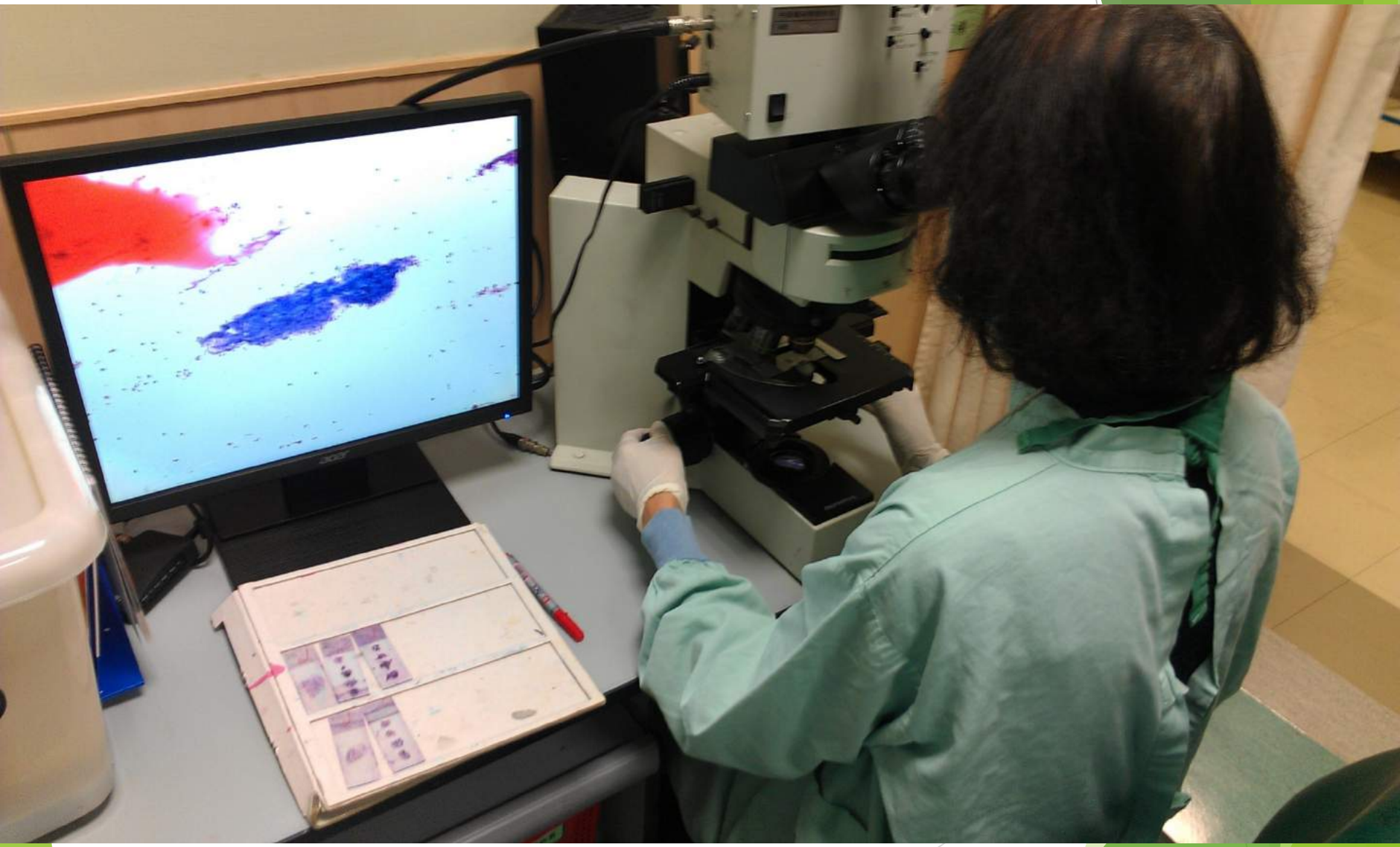


中國附醫研究數據分享

Improved diagnostic yield of bronchoscopy in peripheral pulmonary lesions: combination of radial probe endobronchial ultrasound and rapid on-site evaluation.

Chen, C. H., Cheng, W. C., Wu, B. R., Chen, C. Y., Chen, W. C., Hsia, T. C., ... & Wang, K. P. (2015).

Journal of Thoracic Disease, *7*(Suppl 4), S418.

Characteristic of 815 PPL patients and proportion of lesions diagnosed by TBB or brushing using EBUS

Characteristics	Number of patients N=815	Proportion of lesions diagnosed by TBB or brush using EBUS		
		All N=627	With ROSE N=242	Without ROSE N=385
Age	65.7±13.7	66.5±13.2	67.1±13.3	65.0±13.9
Sex				
Male	526 (64.5)	406 (64.8)	153 (63.2)	253 (65.7)
Female	289 (35.5)	221 (35.2)	89 (36.8)	132 (34.3)
Histology of lung malignancy	617 (75.7)	542 (87.8)	225 (91.1)	317 (85.7)
Adenocarcinoma	330 (40.5)	282 (85.5)	119 (88.8)	163 (83.2)
Squamous cell carcinoma	148 (18.2)	143(96.6)	62 (96.9)	81 (96.4)
Large neuroendocrine carcinoma	10 (1.2)	6 (60.0)	3 (75.0)	3 (50.0)
Small cell lung cancer	62 (7.6)	58 (93.5)	23 (95.8)	35 (92.1)
Non-small cell lung cancer	28 (3.4)	22 (78.6)	5 (83.3)	17 (77.3)
Metastasis lung tumor	32 (3.9)	26 (81.3)	11 (100.0)	15 (71.4)
Maltoma	5 (0.6)	4 (80.0)	2 (66.7)	2 (100.0)
Spindle cell carcinoma	2 (0.2)	1 (50.0)	0 (0.0)	1 (100.0)
Type of pulmonary infection	111 (13.6)	85 (76.7)	17 (73.9)	68 (77.3)
Bronchiolitis obliterans organizing pneumonia	8(1.0)	4 (50.0)	0 (0.0)	4 (50.0)
Lung abscess	9(1.1)	9 (100.0)	3 (100.0)	6 (100.0)
Pulmonary TB	66 (8.1)	57 (86.4)	10 (71.4)	47 (90.4)
Aspergillus	9 (1.1)	8 (88.9)	2 (100.0)	6 (85.7)
Cryptococcus	10 (1.2)	1 (10.0)	1 (100.0)	0 (0.0)
Pneumocystis jirovecii	3 (0.4)	3 (100.0)	1 (100.0)	2 (100.0)
Mucormycosis	2 (0.2)	2 (100.0)	0 (0.0)	2 (100.0)
Sclerosing hemangioma	3 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)
Pulmonary hamartoma	1 (0.1)	1 (100.0)	0 (0.0)	1 (100.0)
Undiagnosis	87 (10.7)	0 (0.0)	0/9 (0.0)	0/78 (0.0)

ROSE, rapid on-site evaluation; TBB, transbronchial biopsy; EBUS, endobronchial ultrasound; PPL, peripheral pulmonary lesion.

Accuracy of ROSE in predicting final EBUS diagnosis of malignancy

ROSE	Final result of TBB or brush using EBUS	
	Diagnostic for malignancy	Not diagnostic for malignancy
Diagnostic for malignancy	221	0
Not diagnostic for malignancy	4	17

Sensitivity = 98.2% (221/ 225 cases)

Specificity = 100% (17/17)

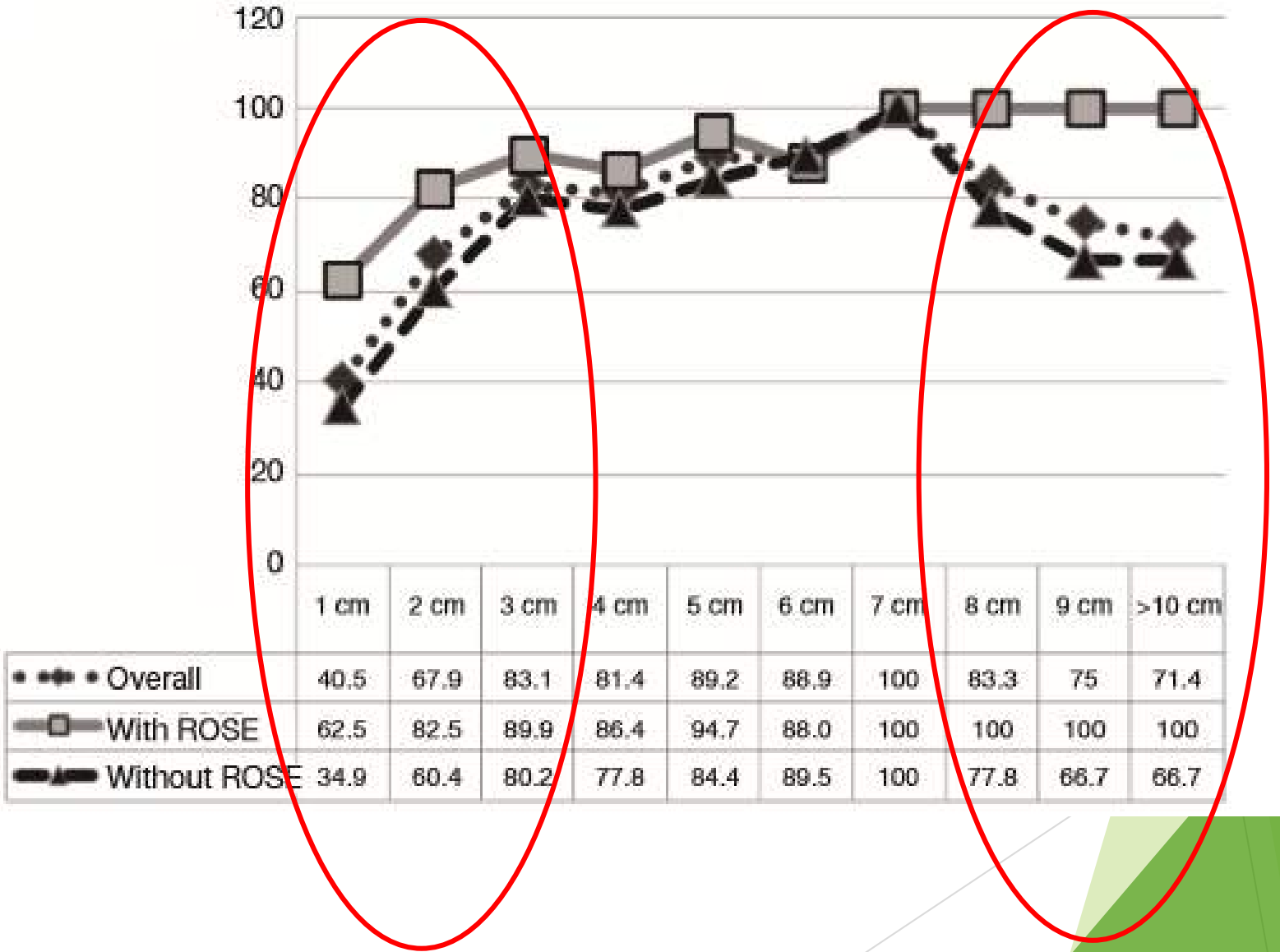
Diagnostic accuracy = 98.3% (238/242 cases)

Diagnostic yields by TBB or brushing using EBUS with and without ROSE, based on the lesion of size and location on CT scan

Variables	Overall diagnostic yield	Diagnostic yield with/without ROSE		
		With ROSE	Without ROSE	P value
Lesion size (cm)				
Bronchus sign +/>3	357/398 (89.7)	137/149 (91.9)	220/249 (88.4)	0.308
Bronchus sign +/<3	56/75 (74.7)	20/25 (80.0)	36/50 (72.0)	0.577
Bronchus sign –/>3	124/167 (74.3)	48/57 (84.2)	76/110 (69.1)	0.040
Bronchus sign –/<3	90/175 (51.4)	37/48 (77.1)	53/127 (41.7)	<0.001
Lesion location				
Right apical and left apical posterior segment	87/134 (64.9)	41/53 (77.4)	46/81 (56.8)	0.015
Other location	540/681 (79.3)	201/226 (88.9)	339/455 (74.5)	<0.001
Position of the probe				
Within	559/642 (87.1)	220/238 (92.4)	339/404 (83.9)	0.002
Not within	68/173 (39.3)	22/41 (53.7)	46/132 (34.8)	0.031
Pleural effusion contact				
With pleural effusion surrounded lesion	39/67 (58.2)	21/28 (75.0)	18/39 (46.2)	0.044
Without	588/748 (78.6)	221/251 (88.0)	367/497 (73.8)	<0.0001

ROSE, rapid on-site evaluation; TBB, transbronchial biopsy; EBUS, endobronchial ultrasound; CT, computed tomography.

1. Right apical and left apical - posterior segment locations
2. PPL < 3 cm and without bronchus sign
3. PPLs with pleural effusions
4. The position of the probe is not within



	1 cm	2 cm	3 cm	4 cm	5 cm	6 cm	7 cm	8 cm	9 cm	>10 cm
Overall	40.5	67.9	83.1	81.4	89.2	88.9	100	83.3	75	71.4
With ROSE	62.5	82.5	89.9	86.4	94.7	88.0	100	100	100	100
Without ROSE	34.9	60.4	80.2	77.8	84.4	89.5	100	77.8	66.7	66.7

Procedural Details

Variables	With ROSE		Without ROSE
Procedure time (min)	28.12±6.670	≈	27.70±8.4024
Proportion of BAL	45 (16.1%)		531 (99.1%)

BAL, bronchial alveolar lavage; ROSE, rapid on-site evaluation.

The Role of the Pulmonologist in ROSE of TBNA

Physician	Sensitivity, % (95% CI)	Specificity, % (95% CI)	Accuracy, % (95% CI)
Pulmonologist	91 (86-94)	72 (65-78)	80 (77-90)
Cytopathologist	95 (88-95)	92 (87-95)	92 (85-94)

Bonifazi M, et al. CHEST 2014; 145(1):60–65

結論

- Increased diagnostic yield and accuracy.
- Real-time
- Decrease the repeat procedure time
- Pulmonary cytopathology should be added to the training program of pulmonologists.

鏡檢經驗分享及個案討論

- Primary Lung Cancer
- Pulmonary Infection
- Metas. Lung Cancer
- 經由EBUS Medistinal L-N TBNA的診斷個案
- 經由Pleuroscopy診斷個案

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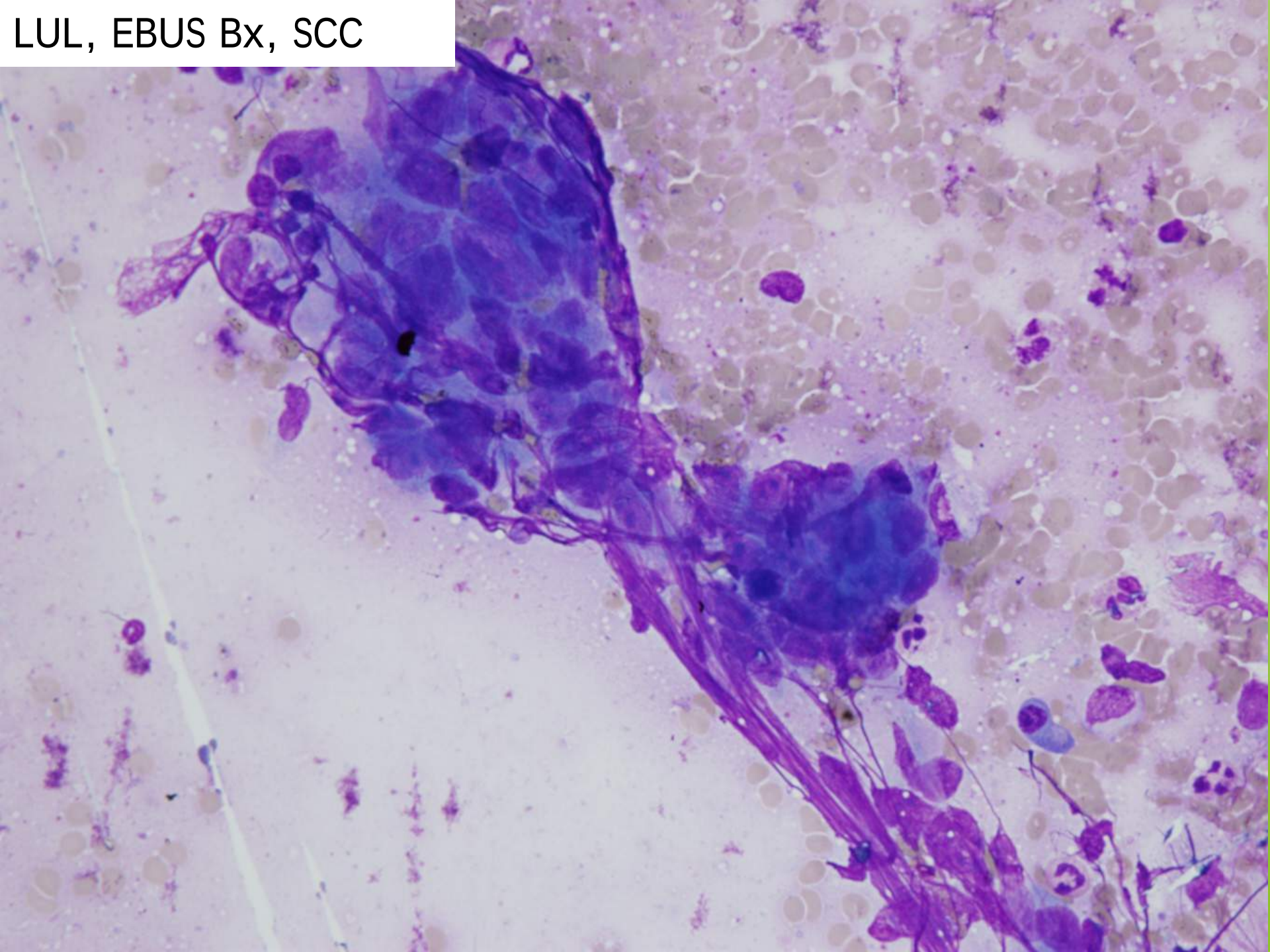
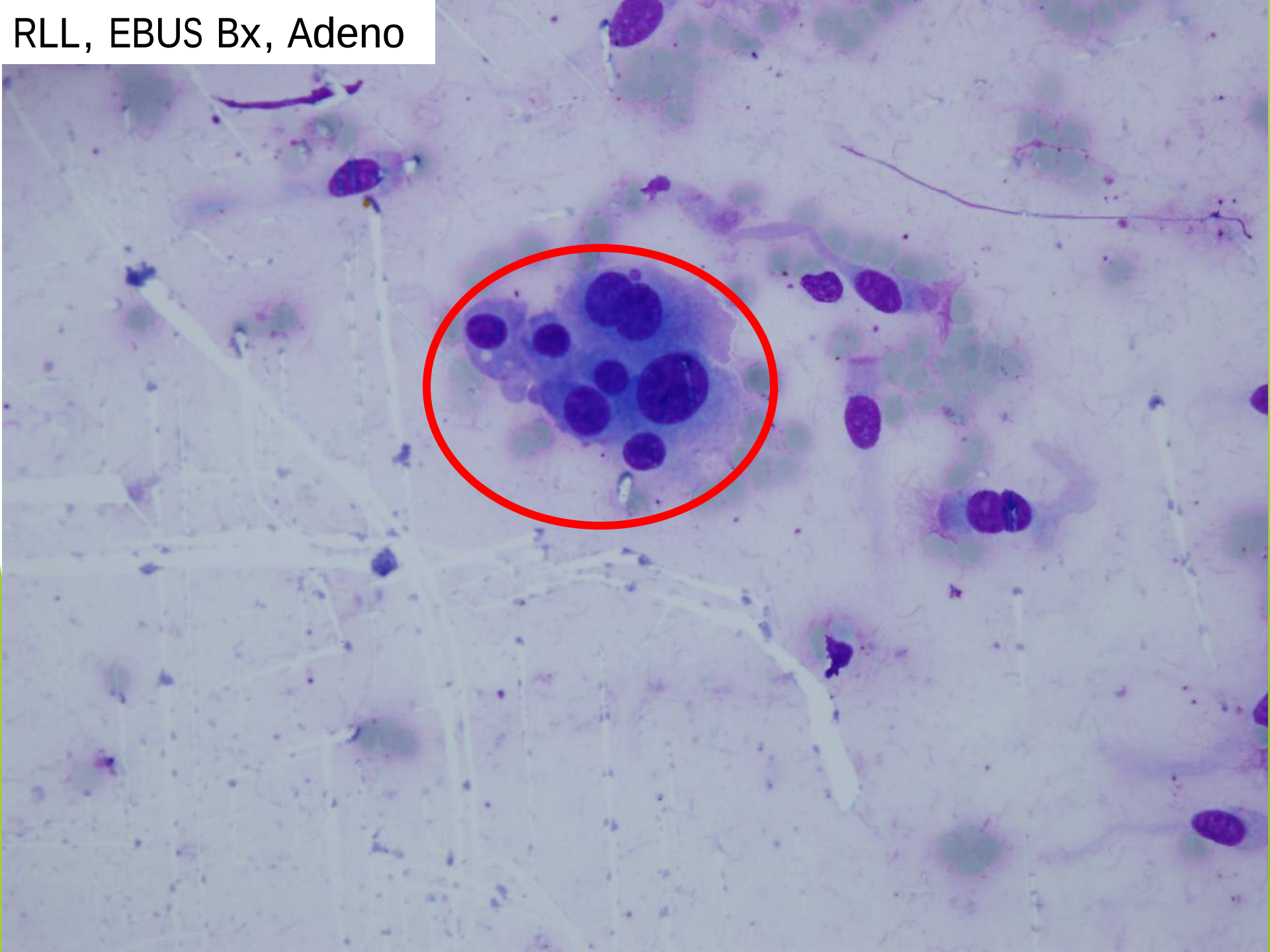
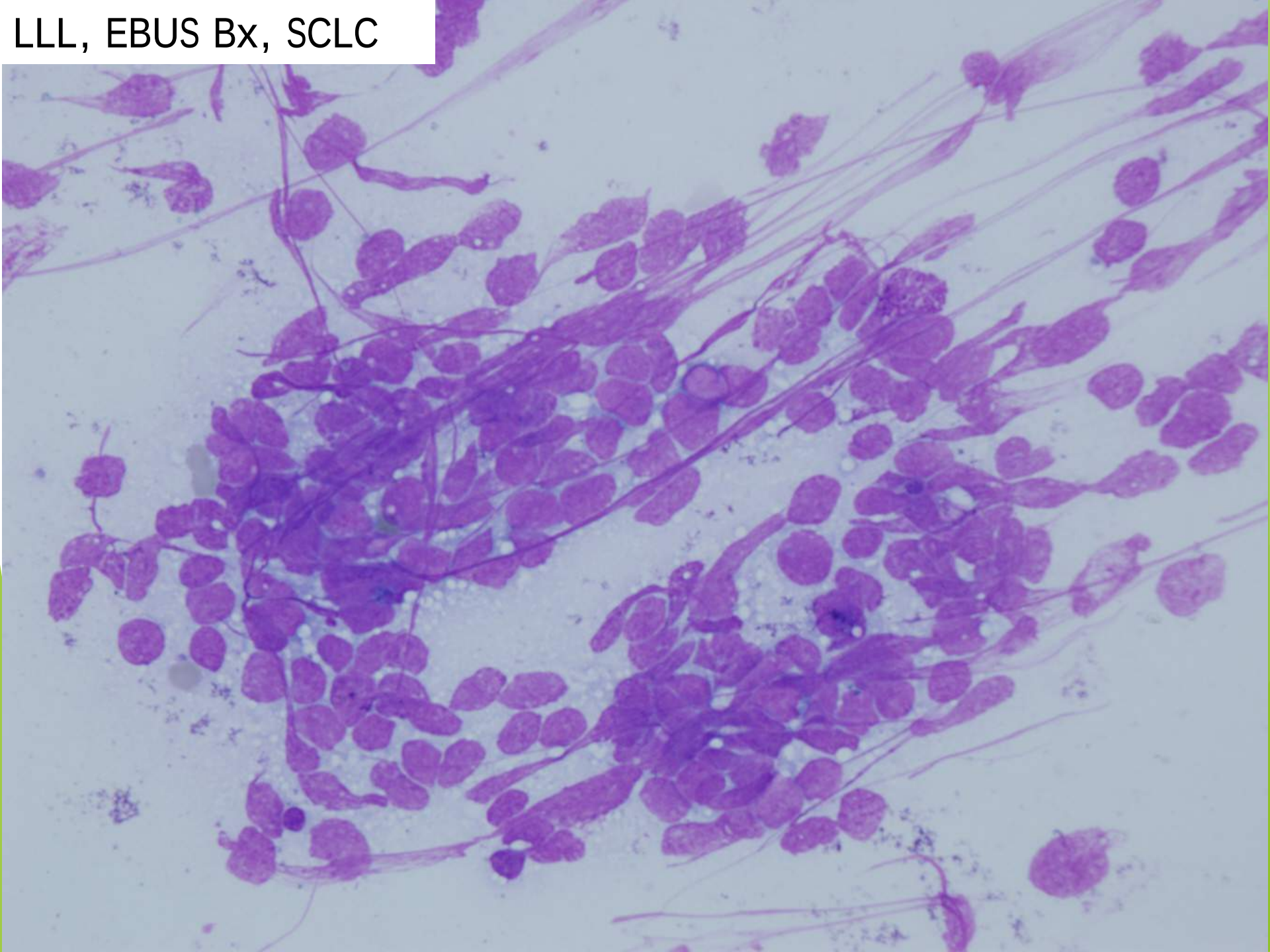

LUL, EBUS Bx, SCC


RLL, EBUS Bx, Adeno


LLL, EBUS Bx, SCLC

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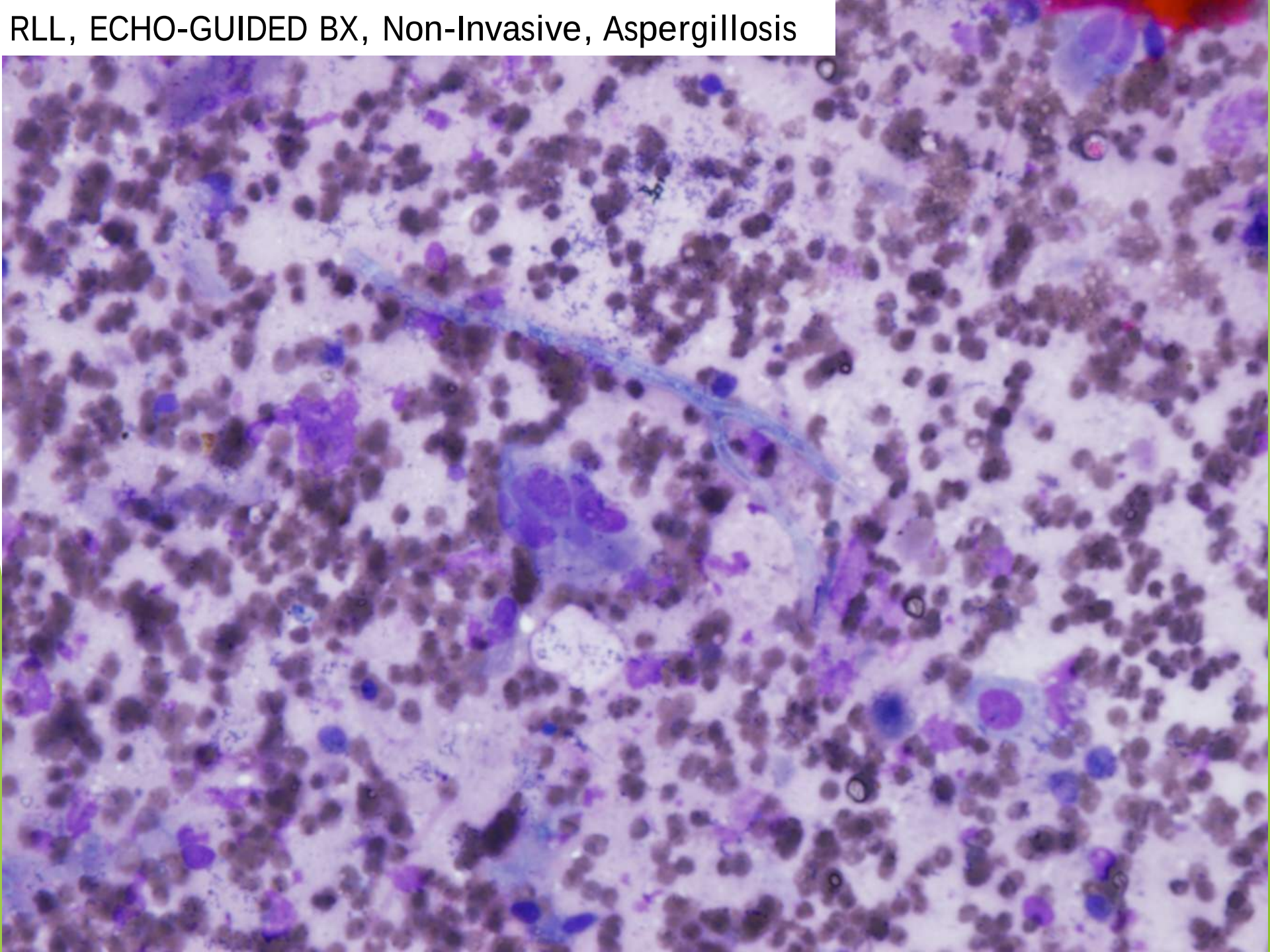
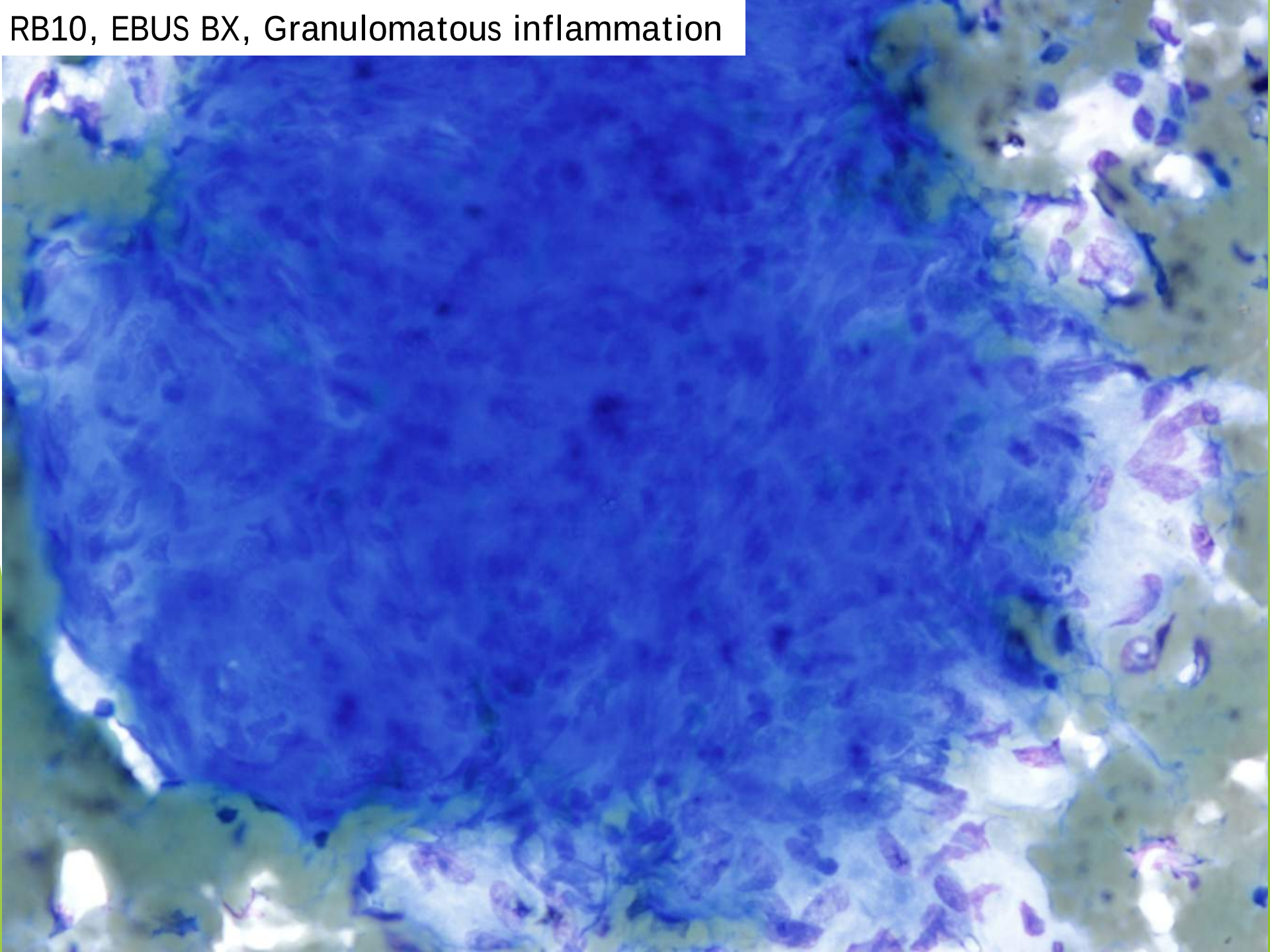
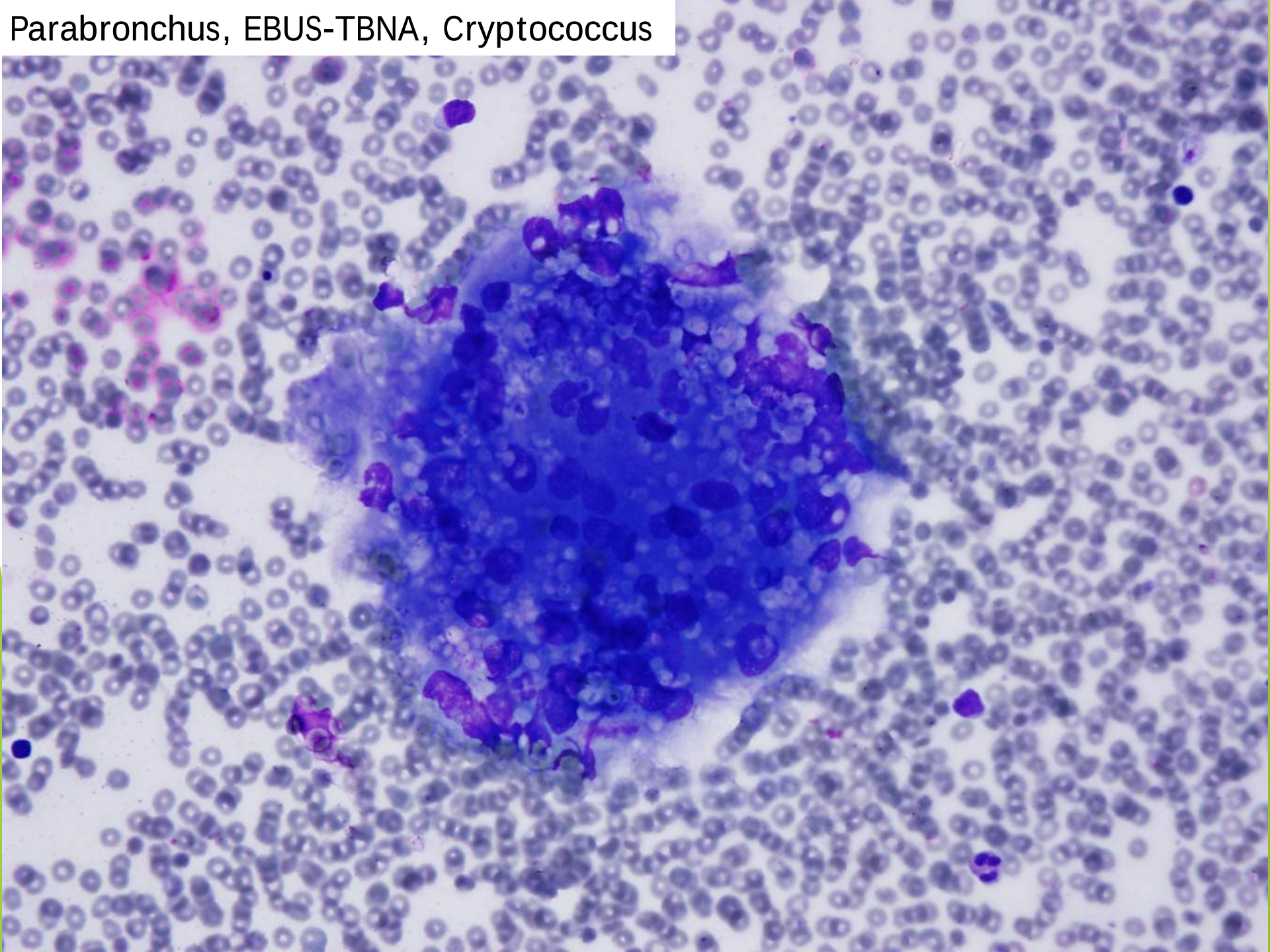
RLL, ECHO-GUIDED BX, Non-Invasive, Aspergillosis



RB10, EBUS BX, Granulomatous inflammation



Parabronchus, EBUS-TBNA, Cryptococcus



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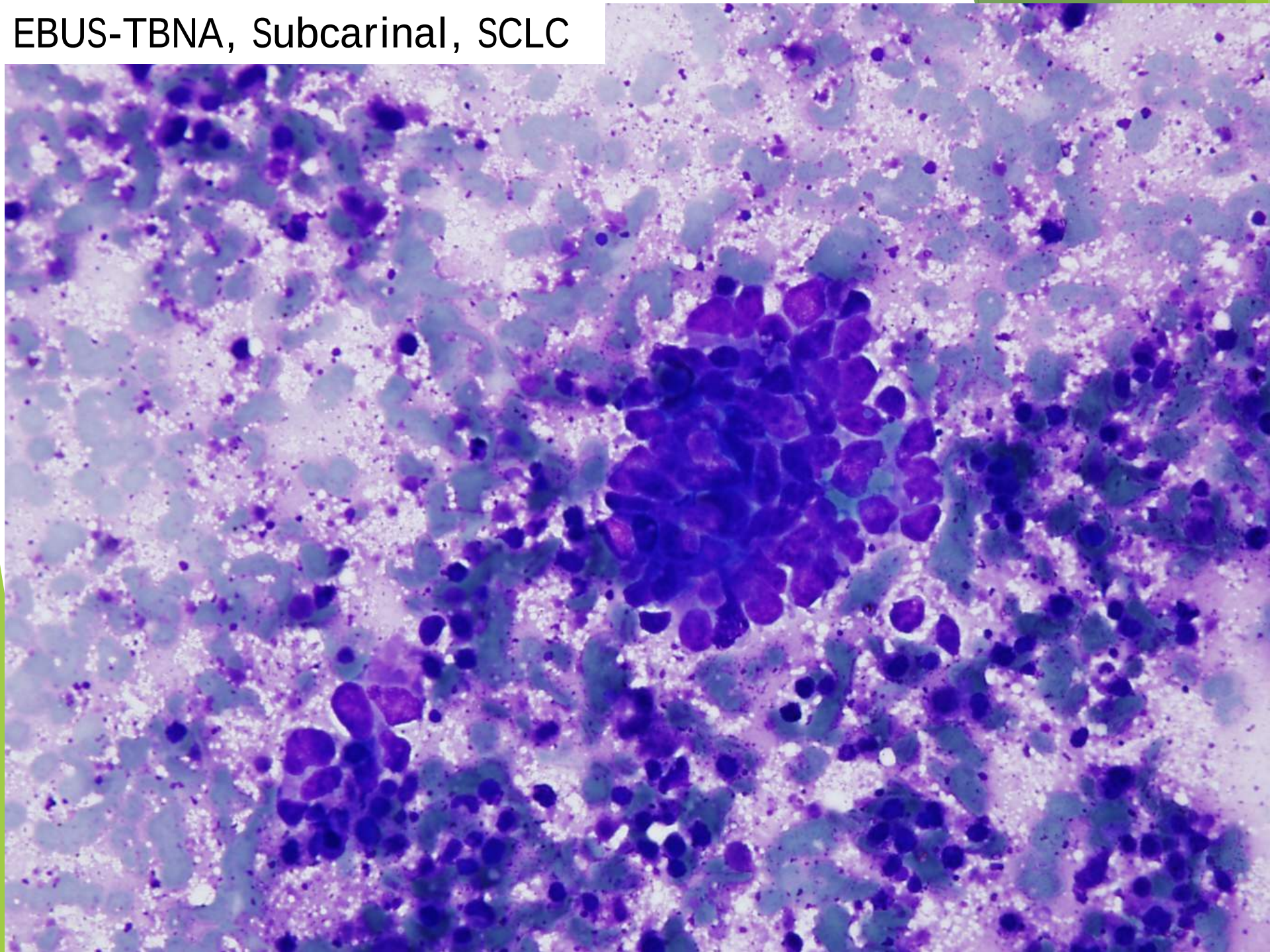
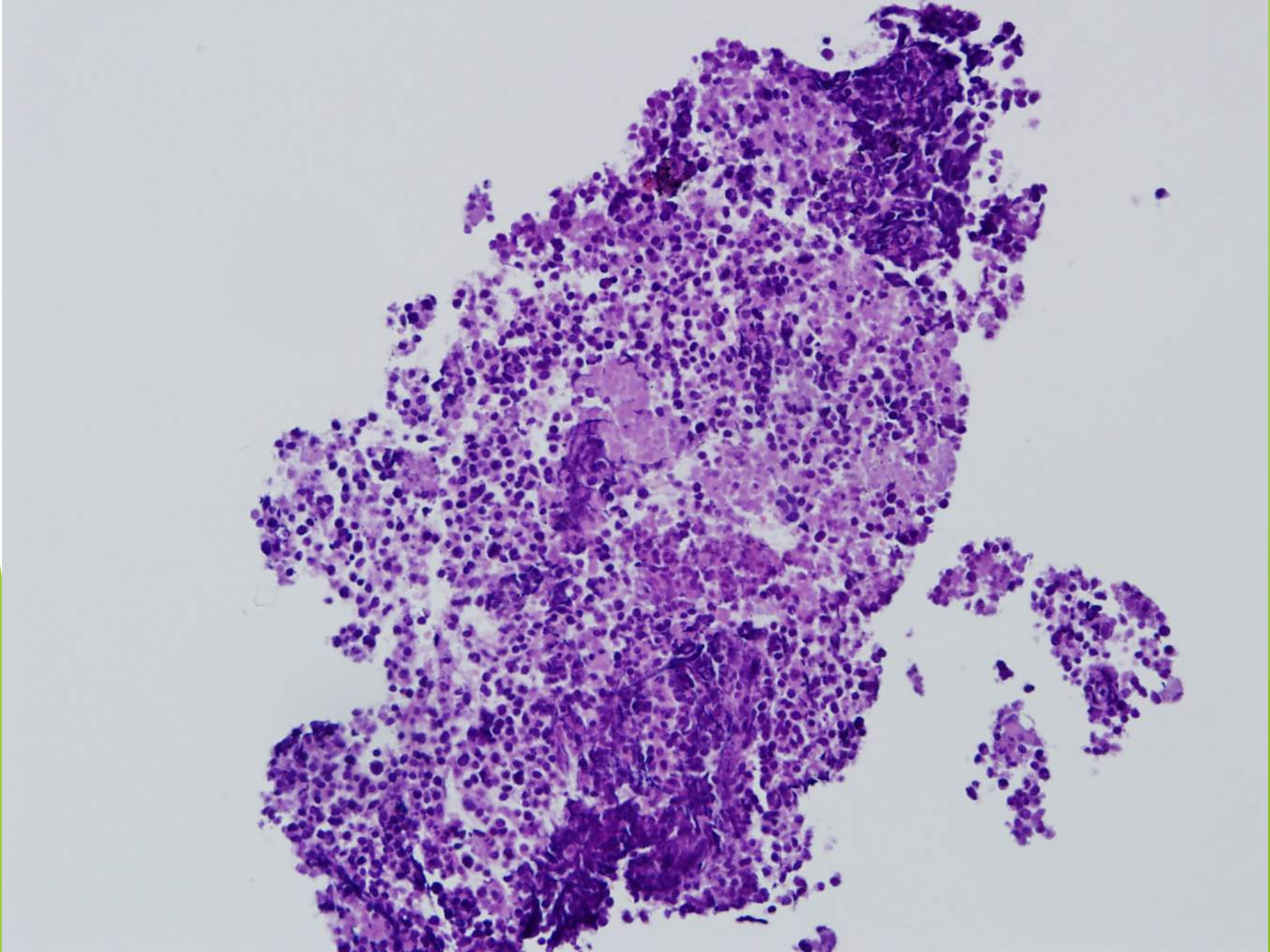
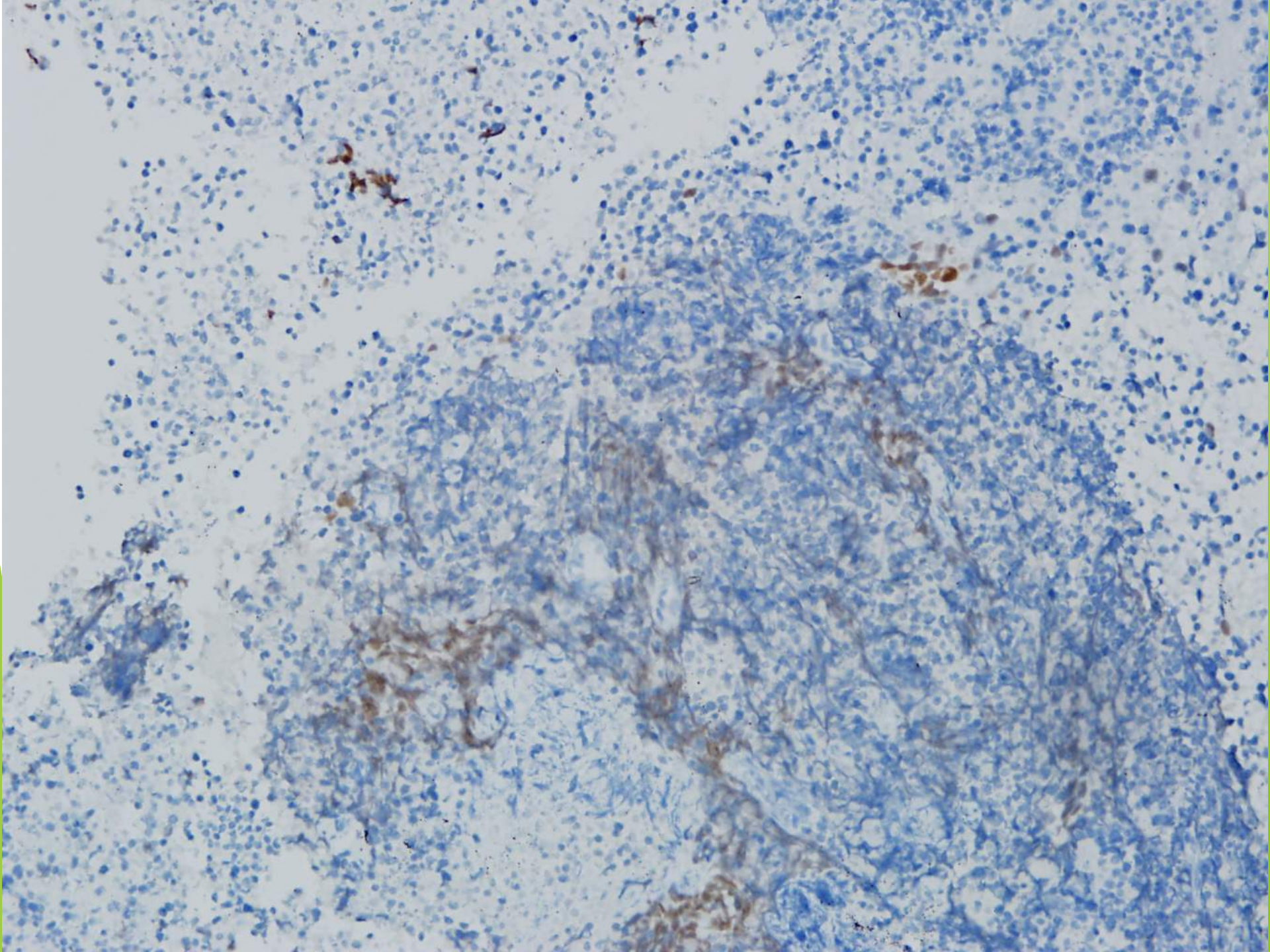
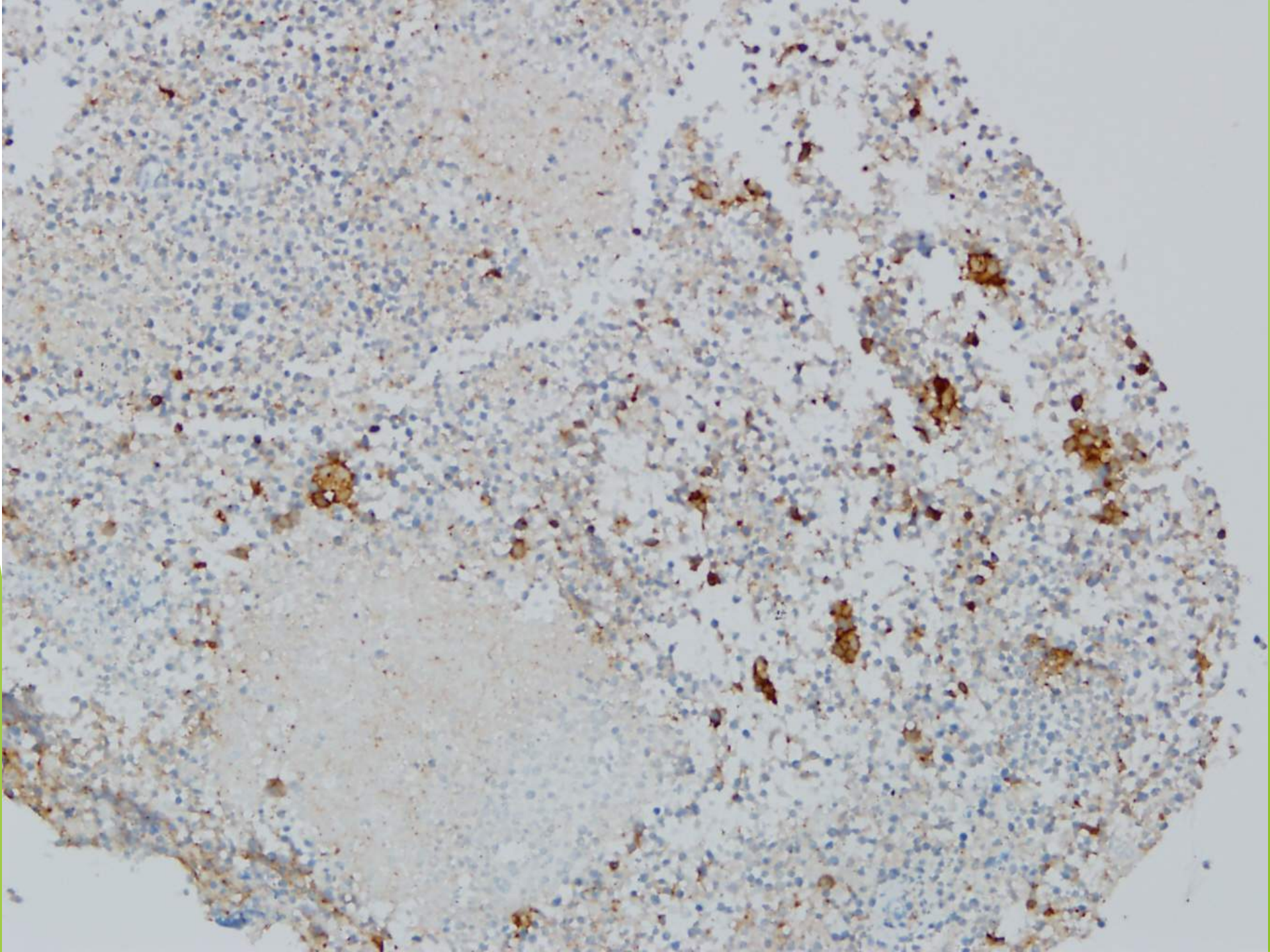
EBUS-TBNA, Subcarinal, SCLC

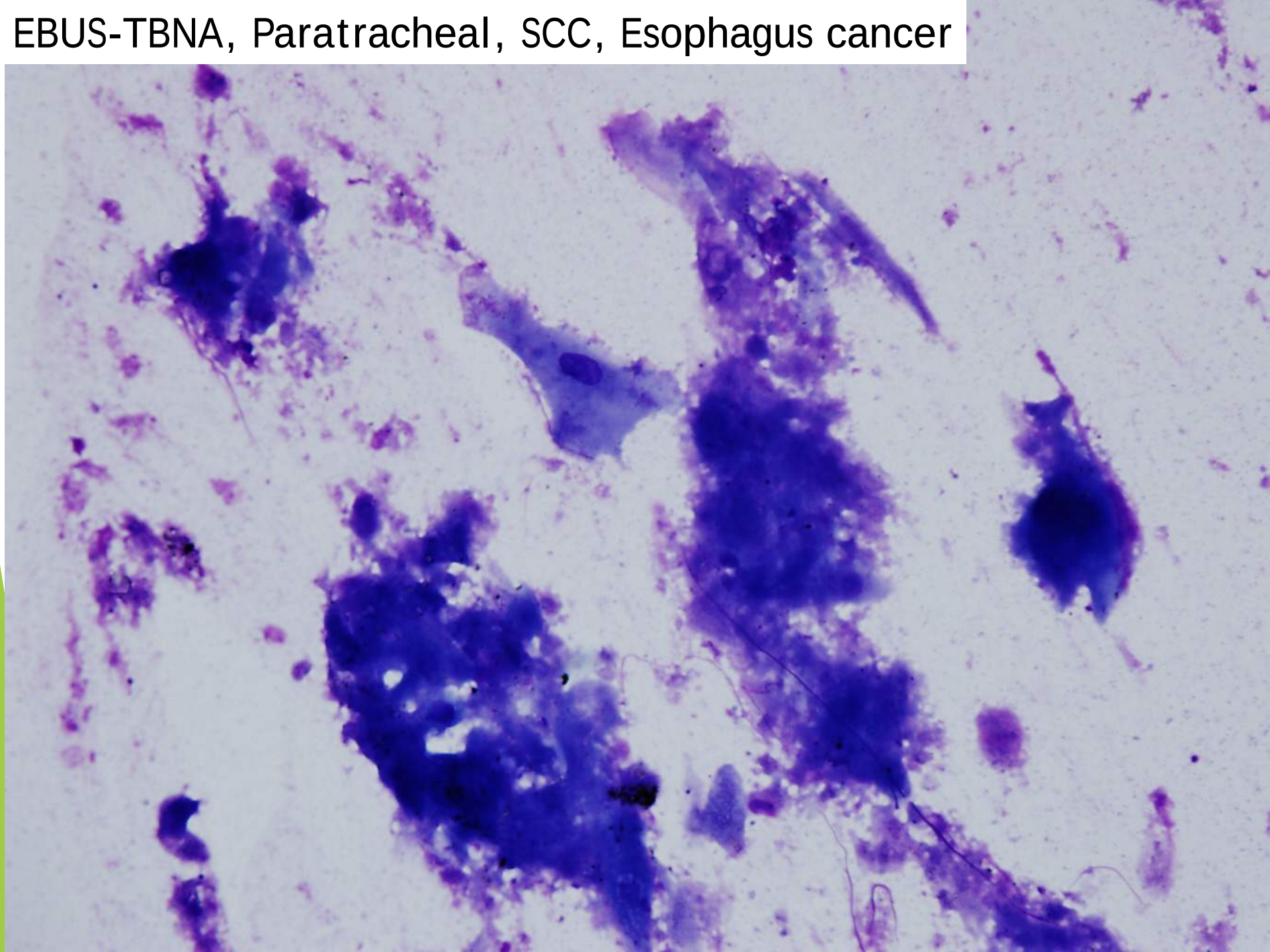




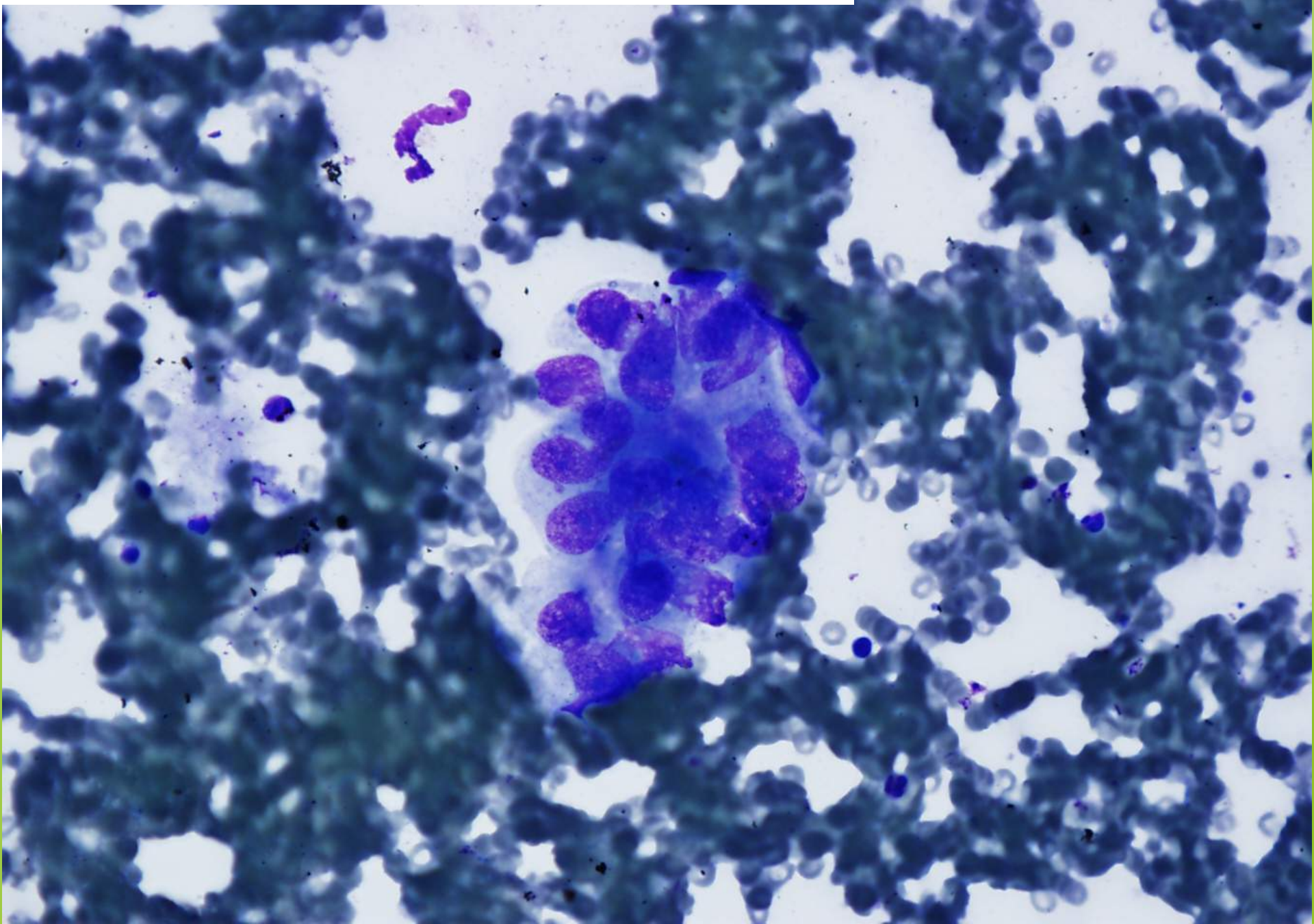


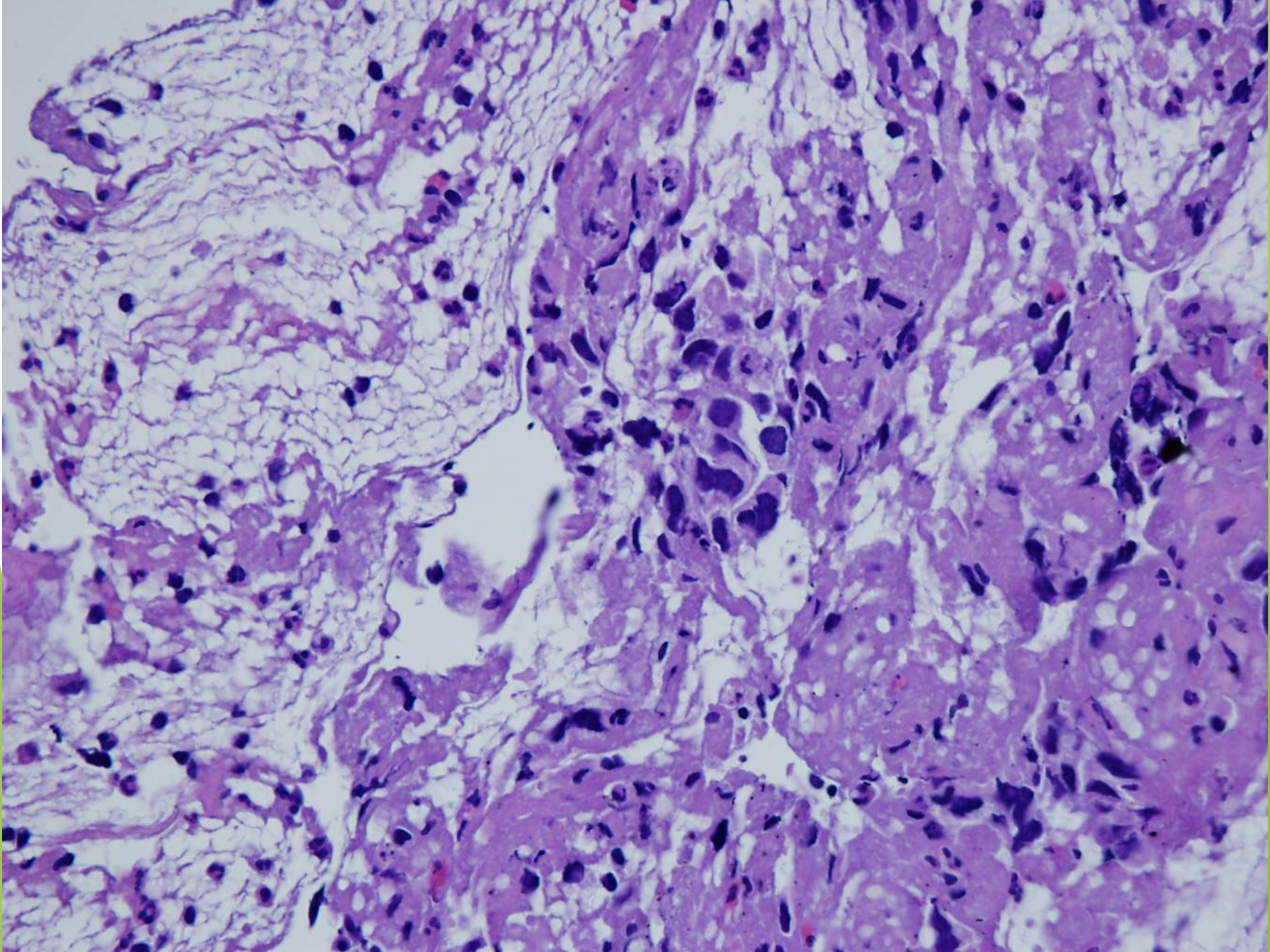


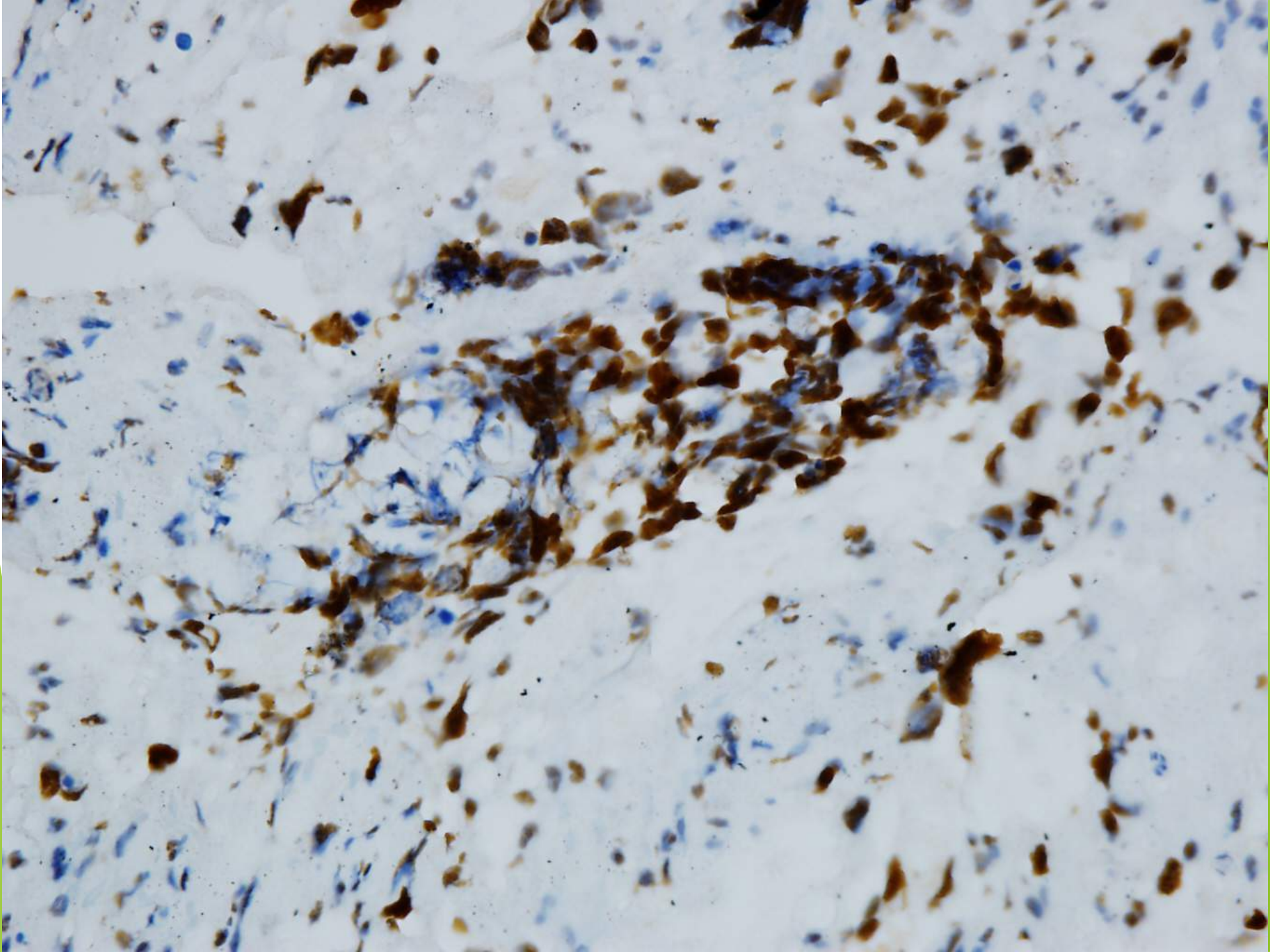
EBUS-TBNA, Paratracheal, SCC, Esophagus cancer

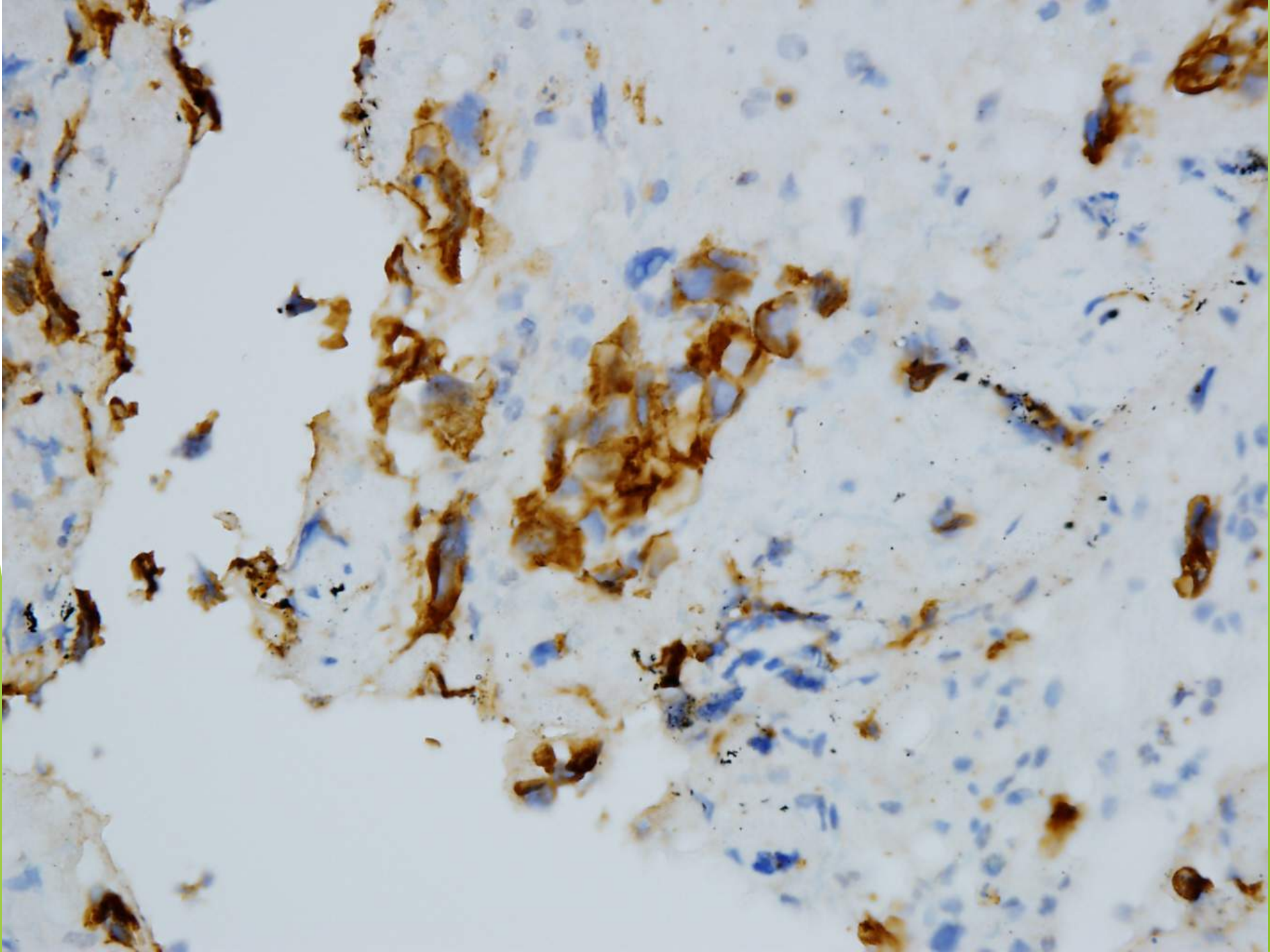


Paratracheal, EBUS-TBNA, Adeno, Lung

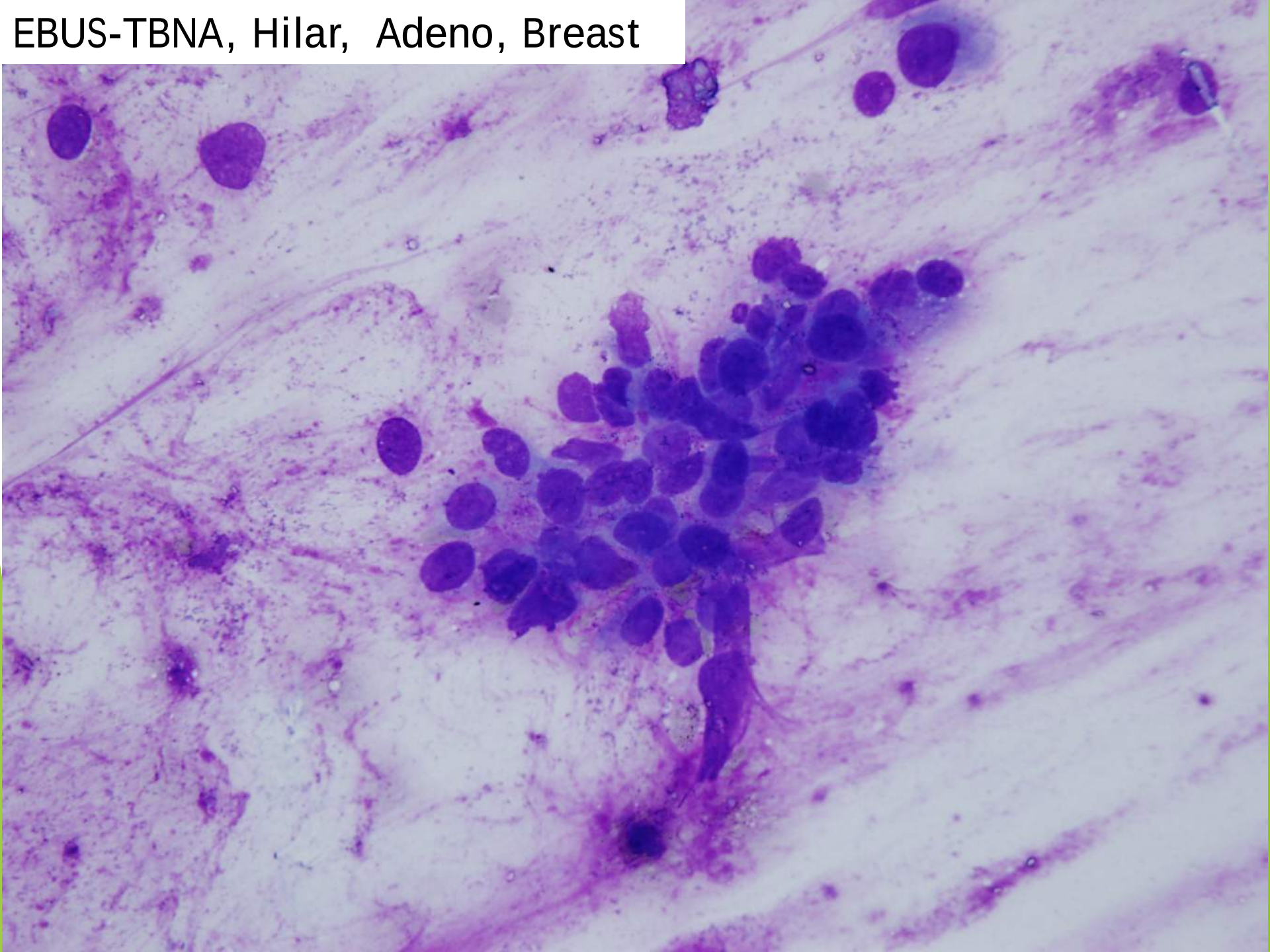


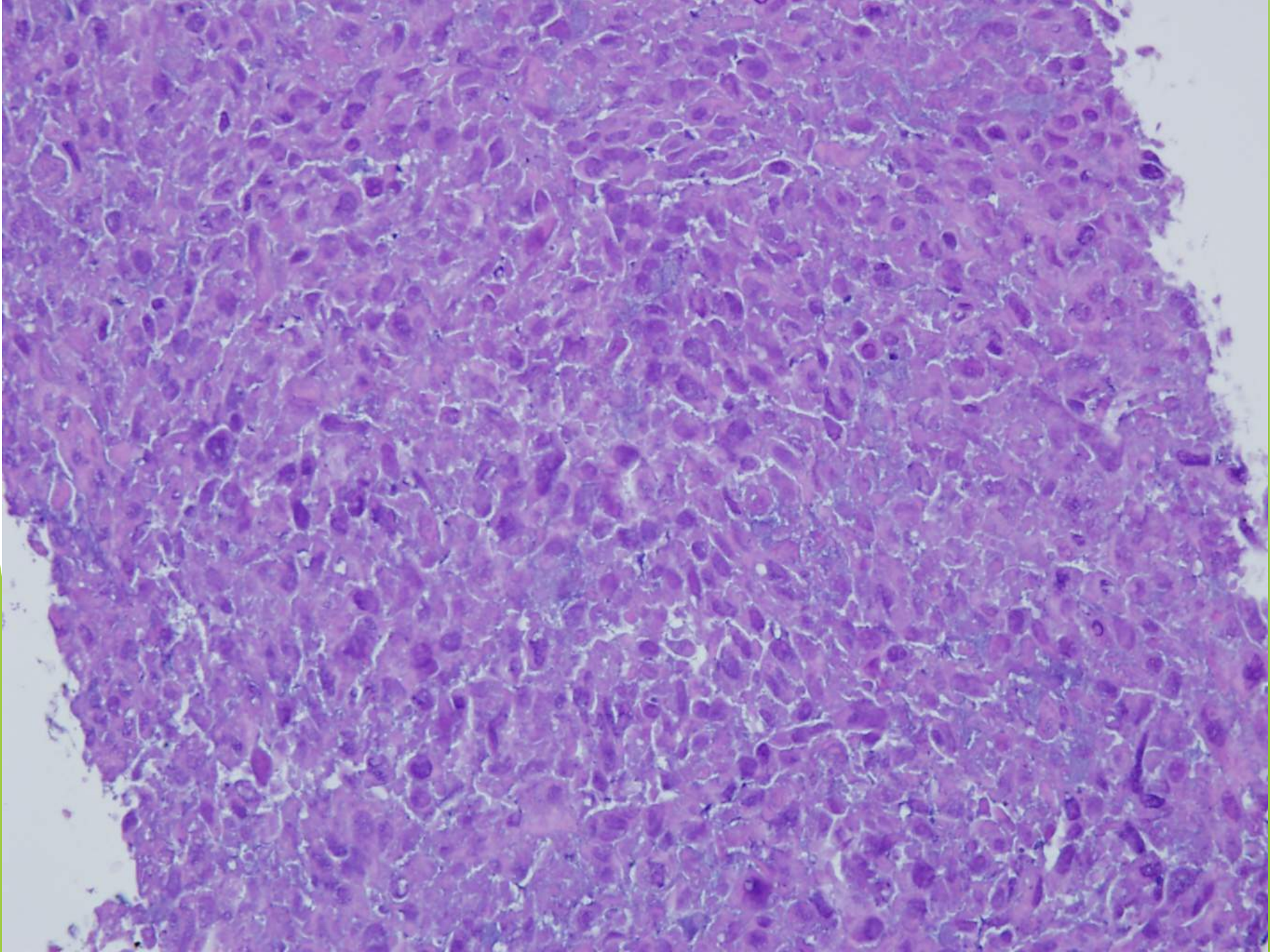


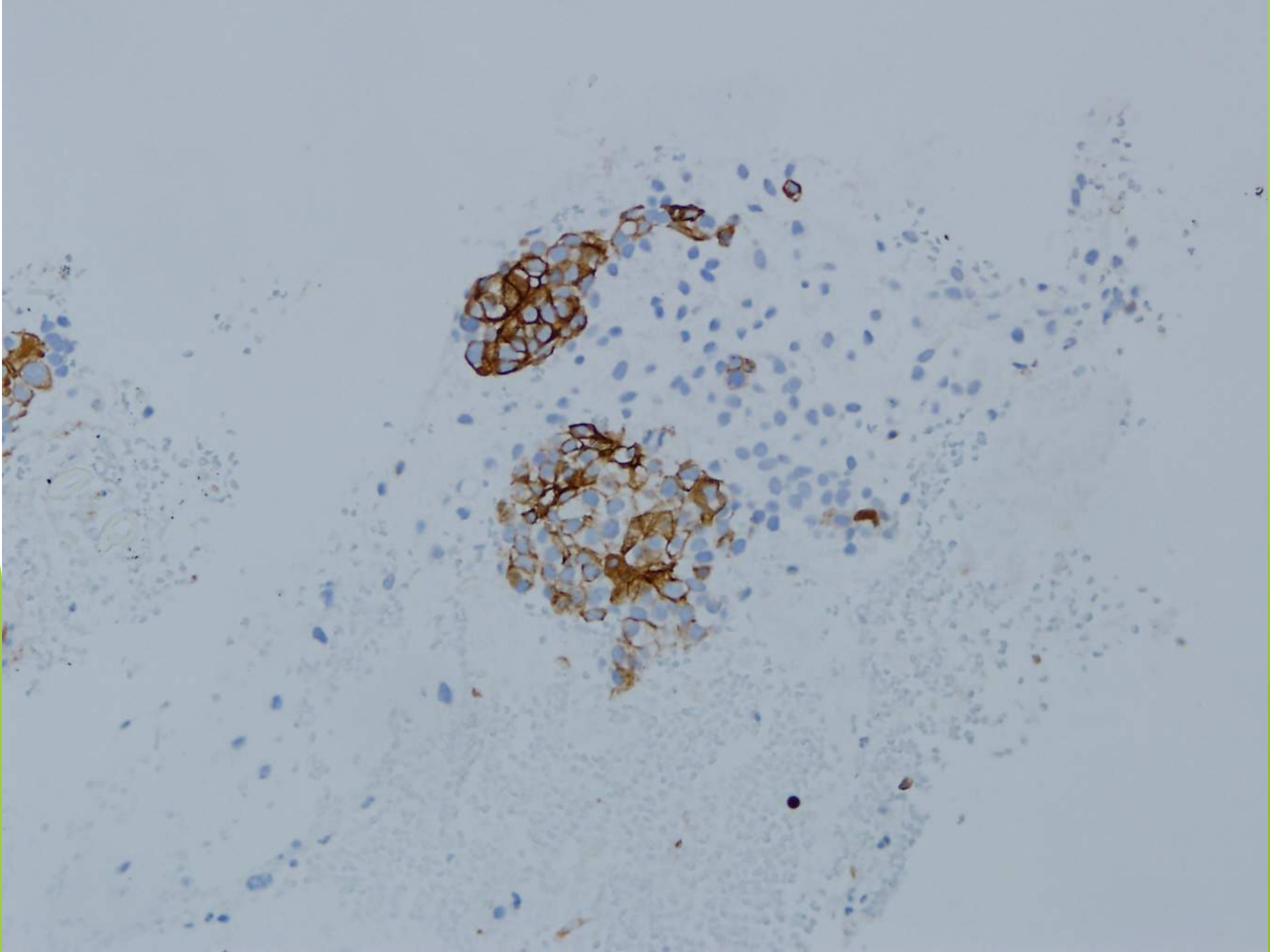




EBUS-TBNA, Hilar, Adeno, Breast







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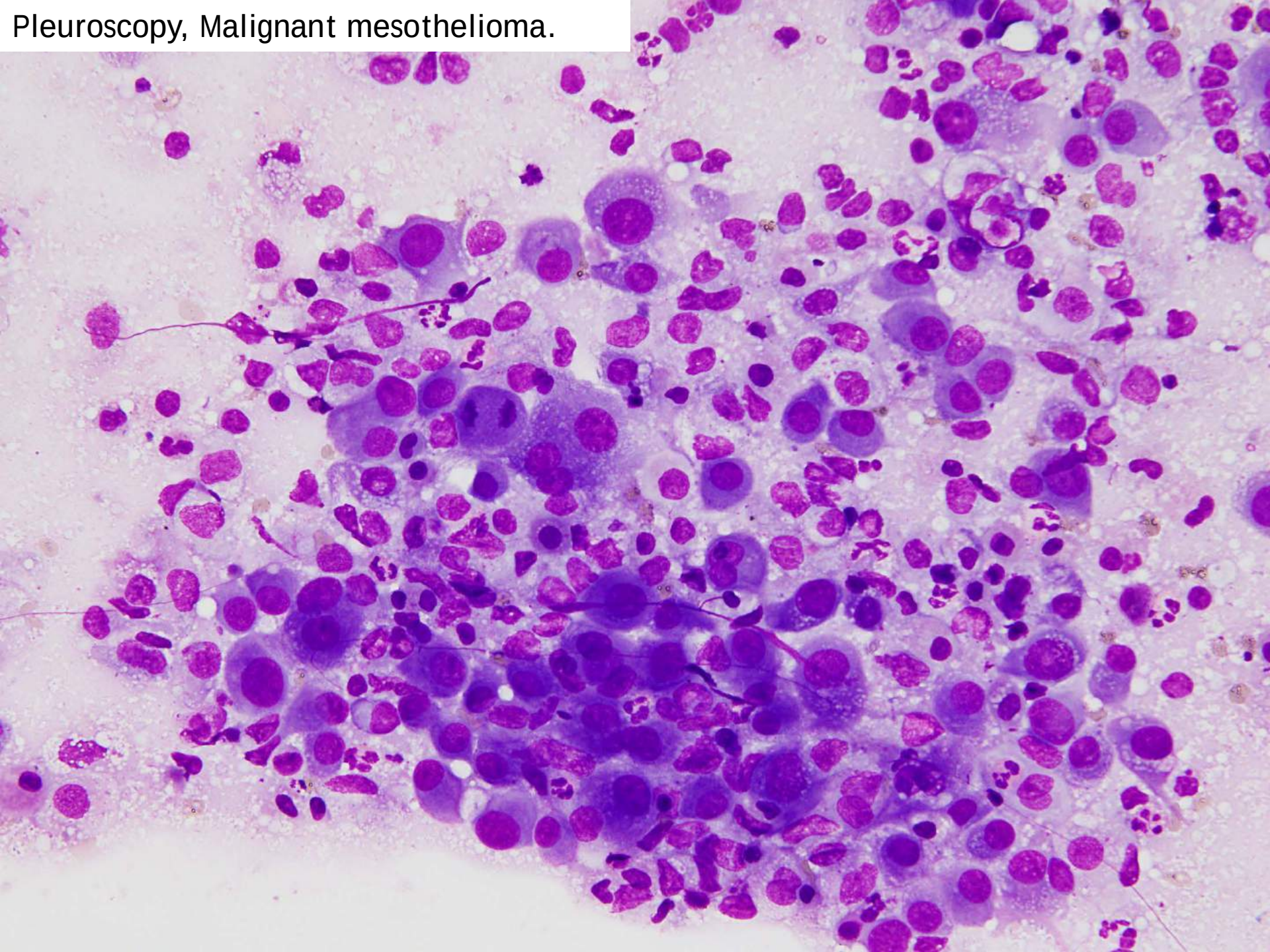
Pleuroscopy, Malignant mesothelioma.



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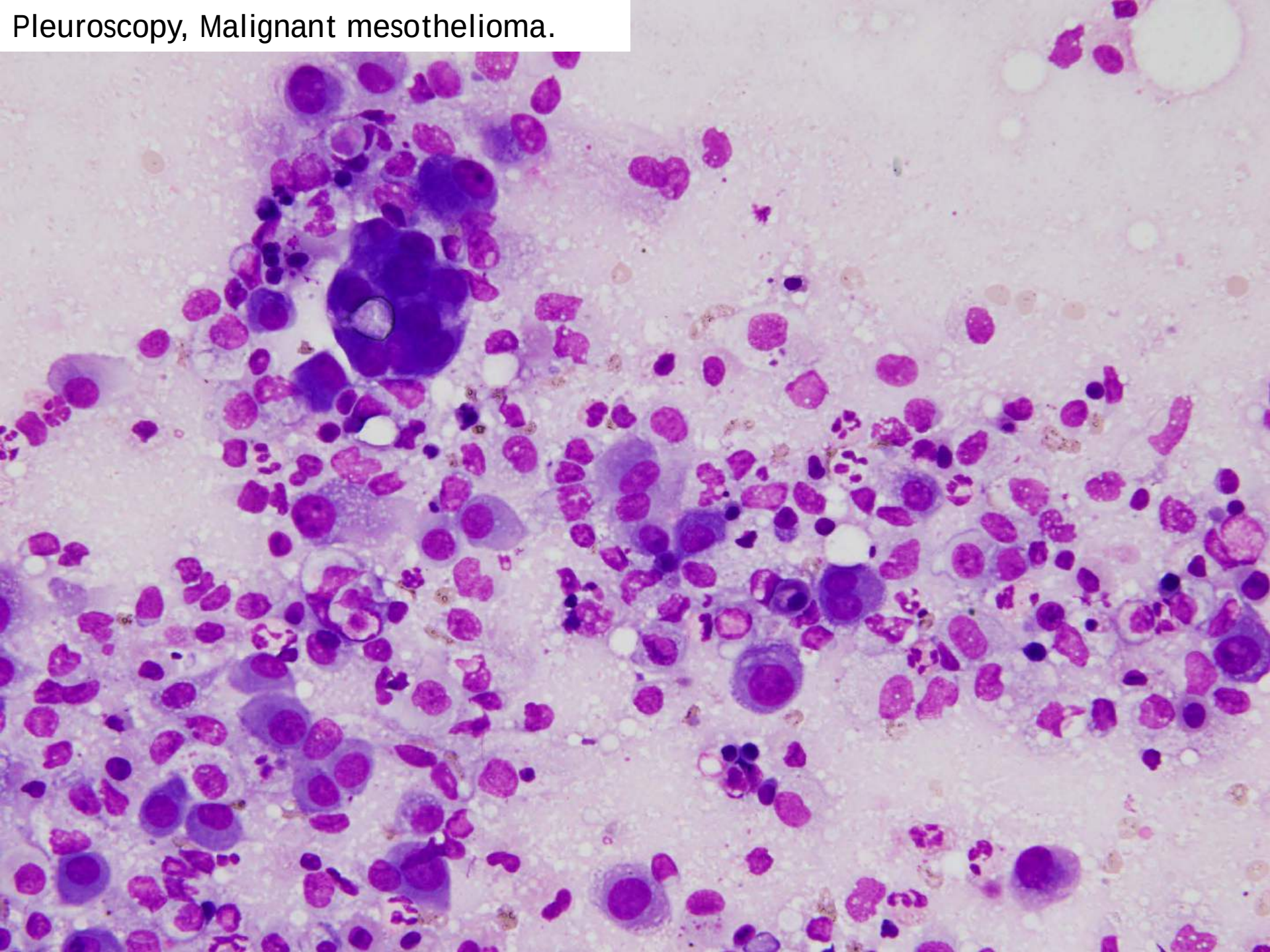

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