

# Case of the month

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# Clinical history

- 70 years-old male. A PET-CT showed a hypermetabolic pulmonary uptake.
- A ROSE-EBUS of mediastinal lymph nodes was performed.

# Cytology

- During the intervention the pulmonologist told the cytopathologist the patient had a recent diagnosis of “something urothelial” carcinoma (no anteriority in our laboratory).
- A preliminary ROSE cytological diagnosis of «lymphocytes and neoplastic cells» was made.

# Cytology

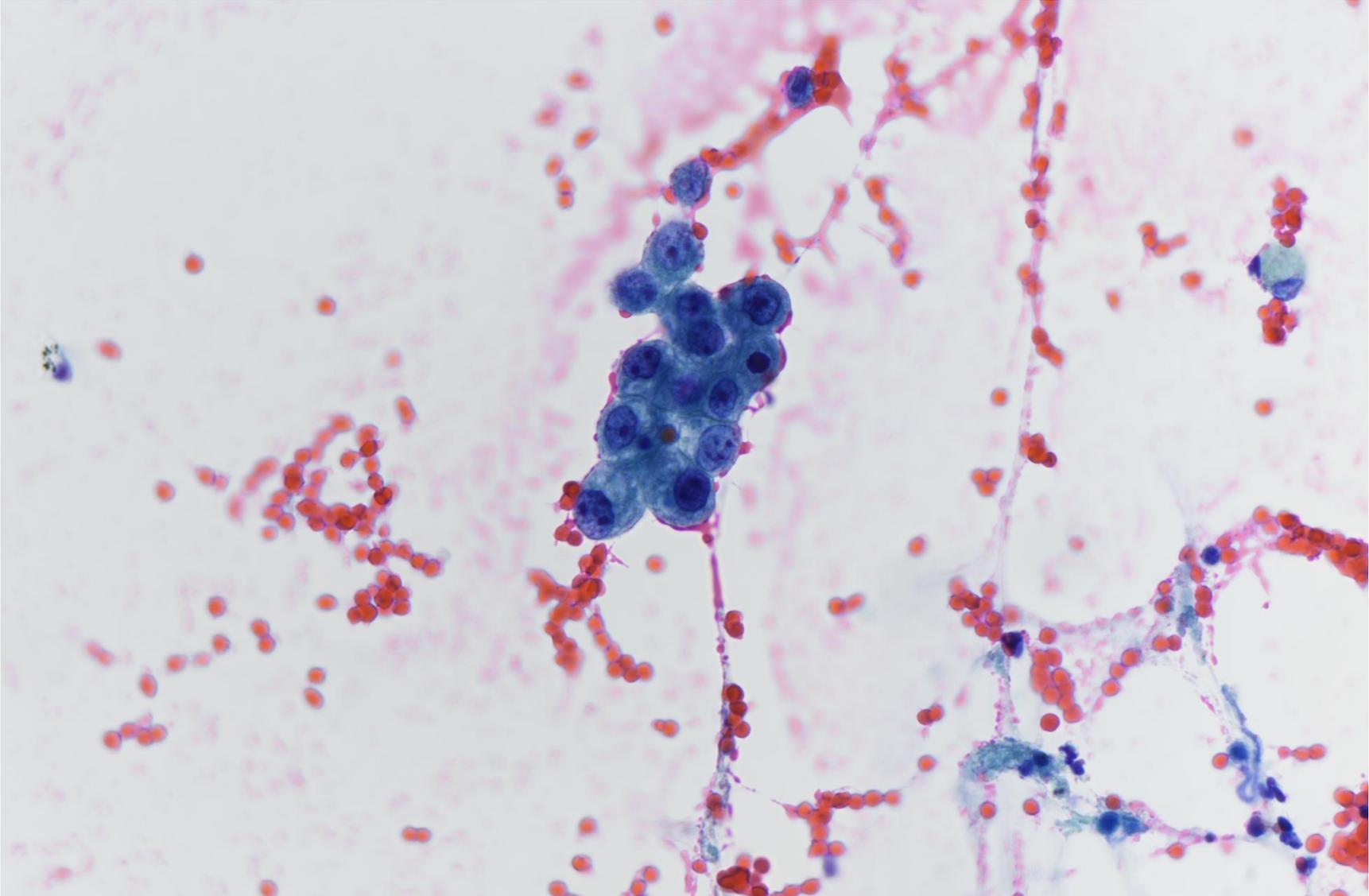
- Cytologic examination showed a markedly cellular sample with many tumoral cells arranged in flat groups or isolated.

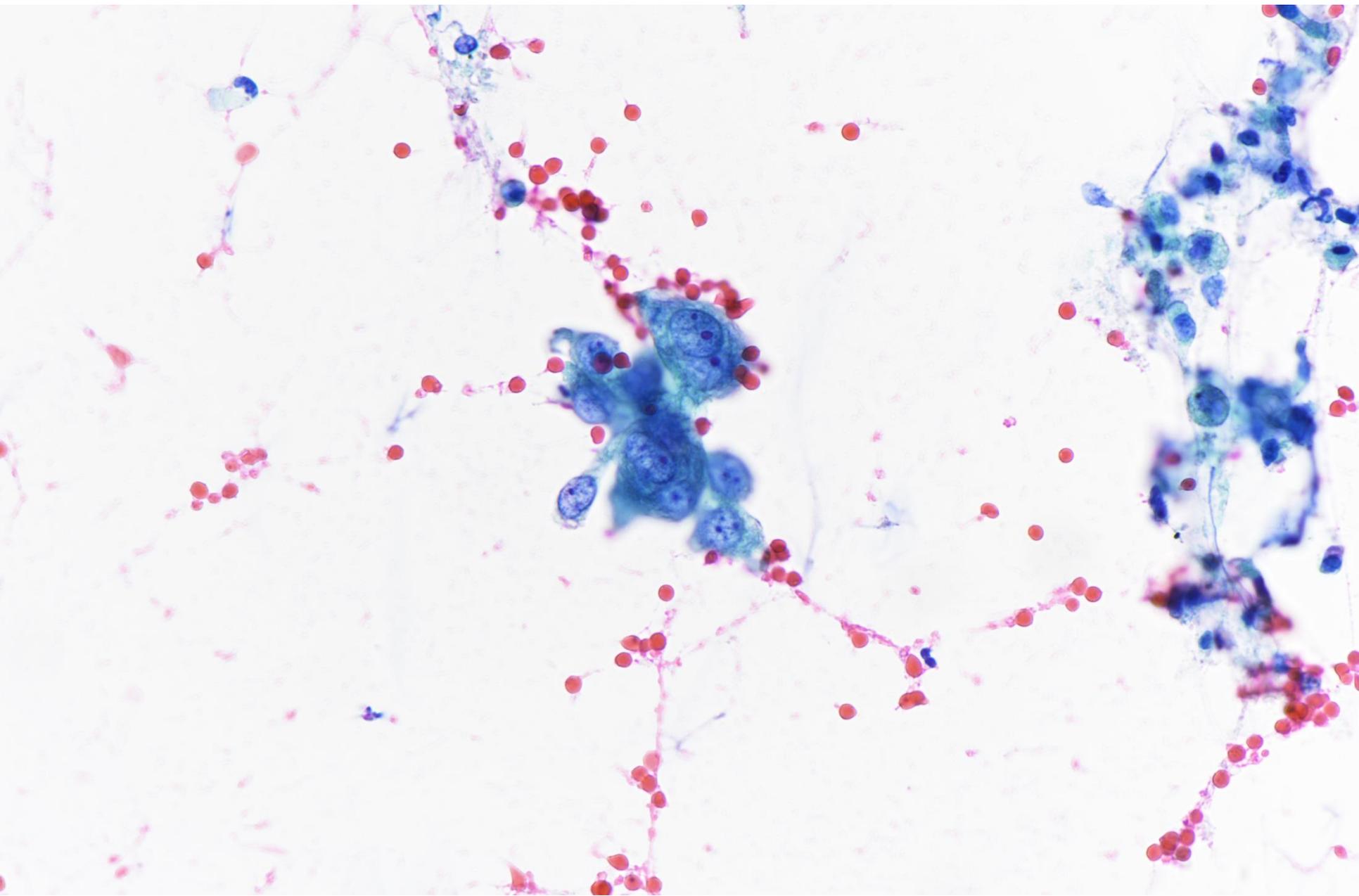
# Cytology

- Cells have dense, well-defined and finely vacuolated cytoplasm, often associated with neutrophils and large nuclei with prominent nucleoli, sometimes multiples.

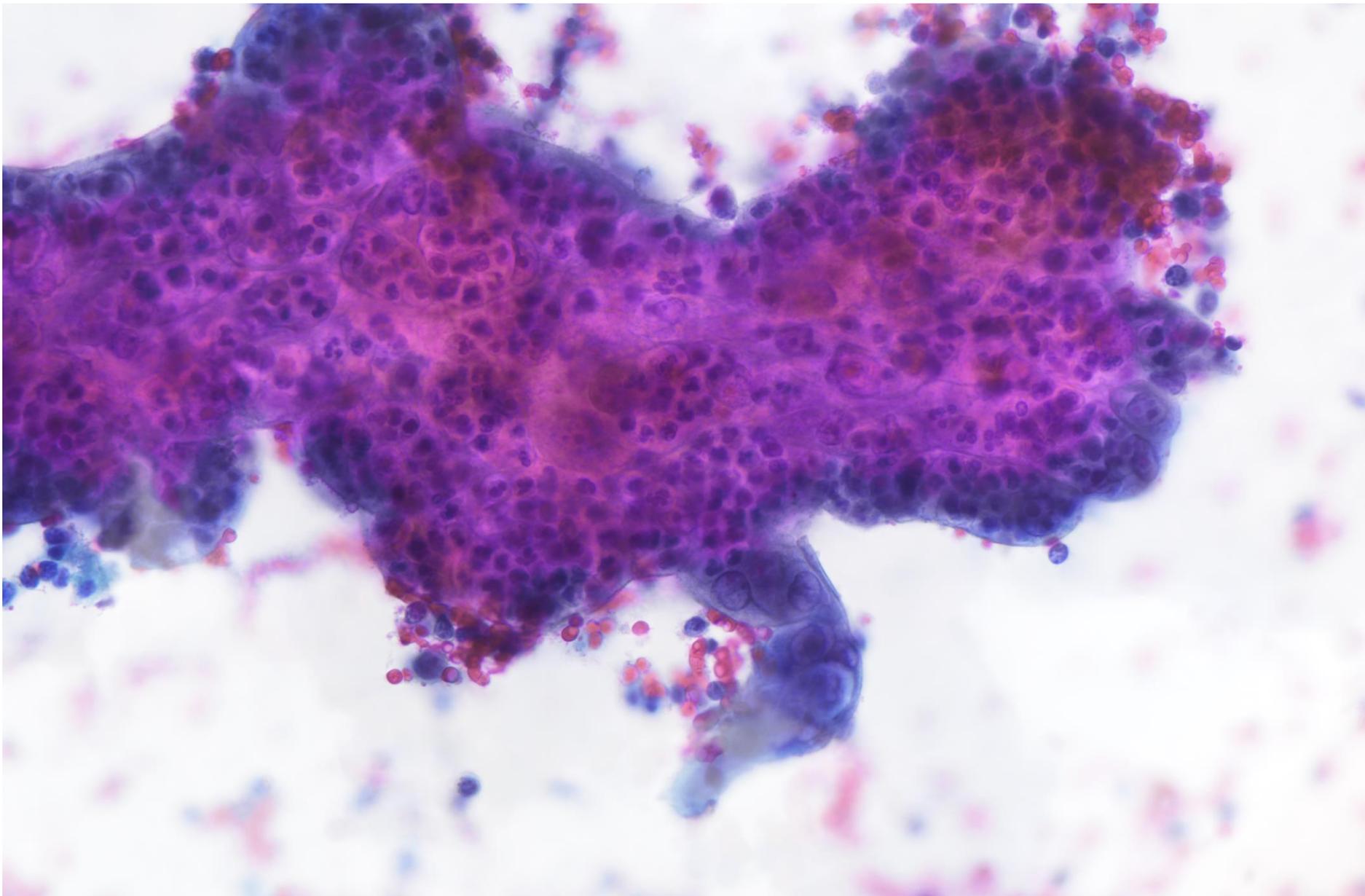
# Cytology

Pap 400x. Flat groups with finely vacuolated cytoplasm, large nuclei with prominent nucleoli.

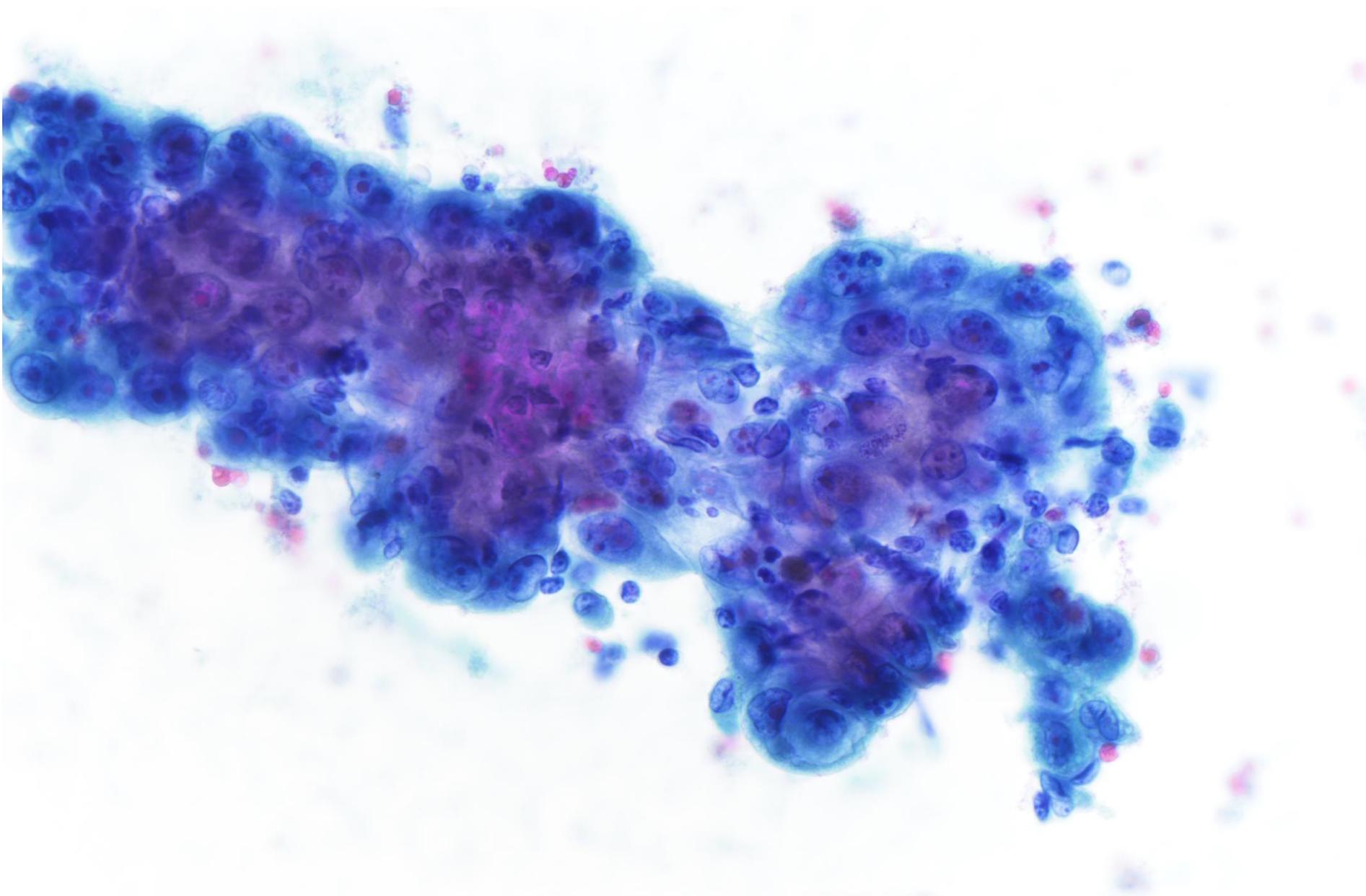




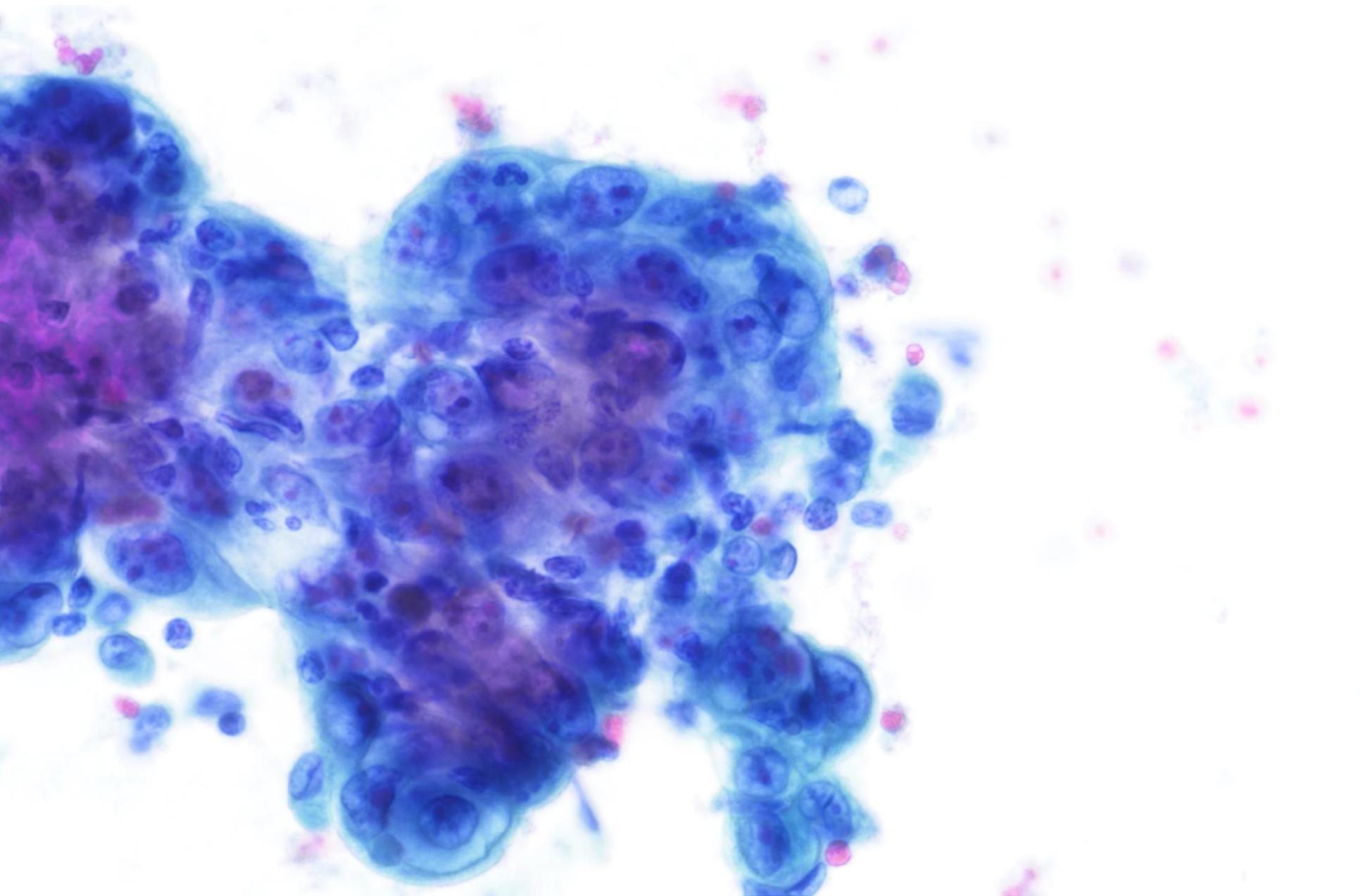
Pap 400x



Pap 400x. Well-defined cytoplasm. Many neutrophils associated.

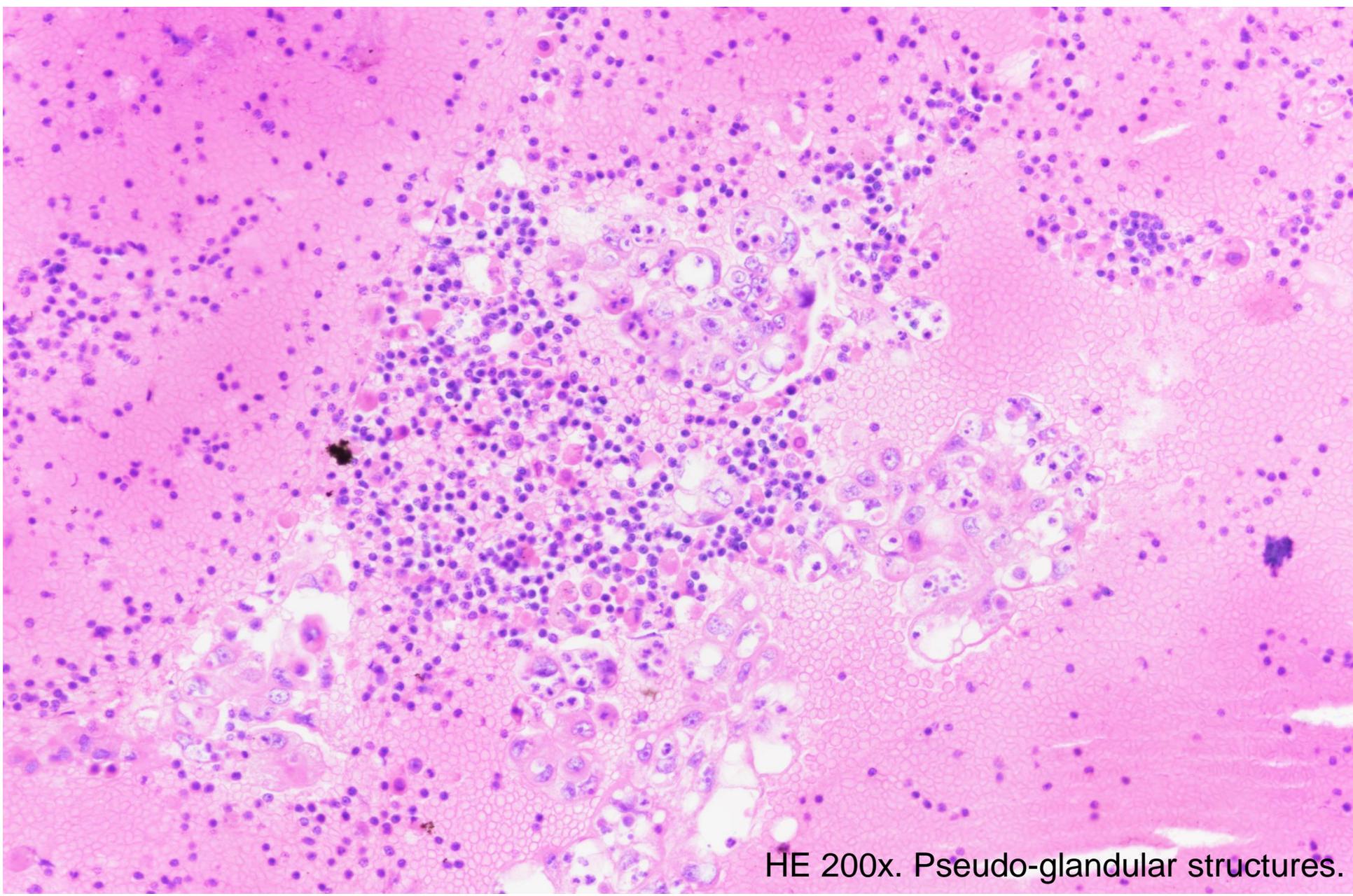


Pap 400x.



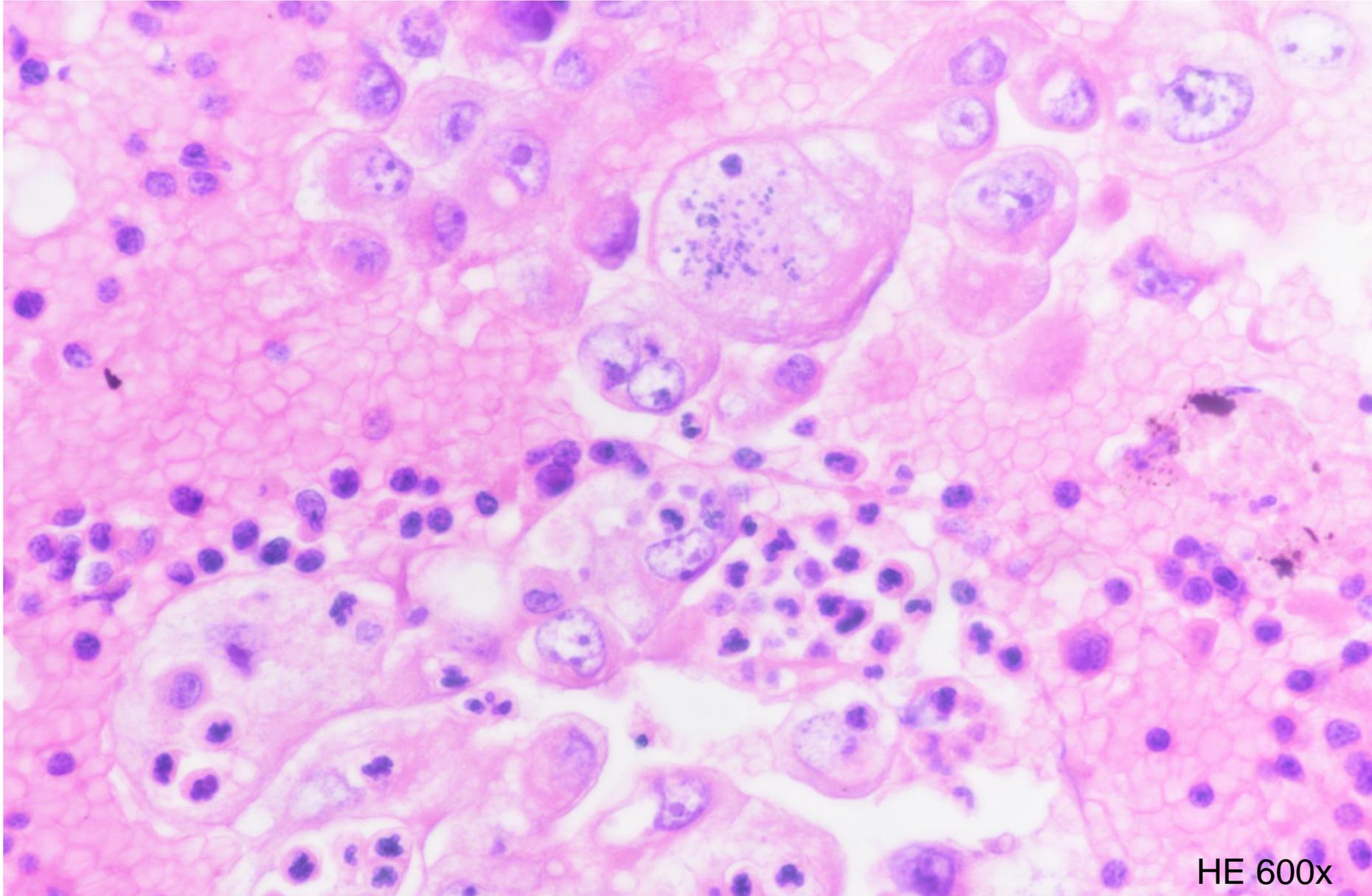
Pap 600x. Dense, well-defined and finely vacuolated cytoplasm, associated with neutrophils and large nuclei with prominent nucleoli.

# Cell-block



HE 200x. Pseudo-glandular structures.

# Cell-block



HE 600x

# Immunocytochemistry

First immunocytochemical panel  
was negative for:

- TTF-1, Napsine A
- P40
- GATA-3, p63





We found a recent diagnosis for this patient of

# **Collecting Duct Carcinoma (of Bellini)**

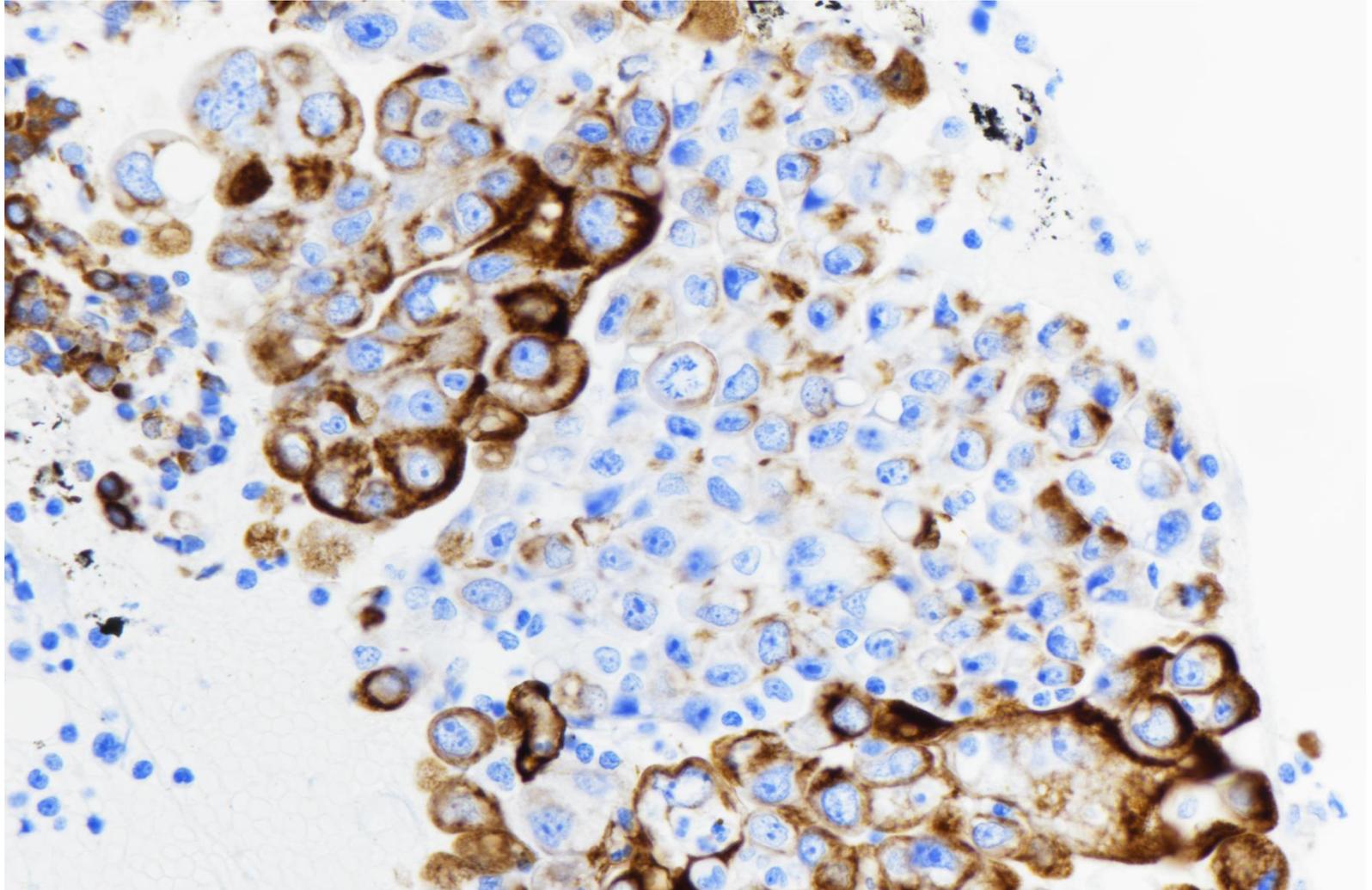
in another laboratory...

# Immunocytochemistry

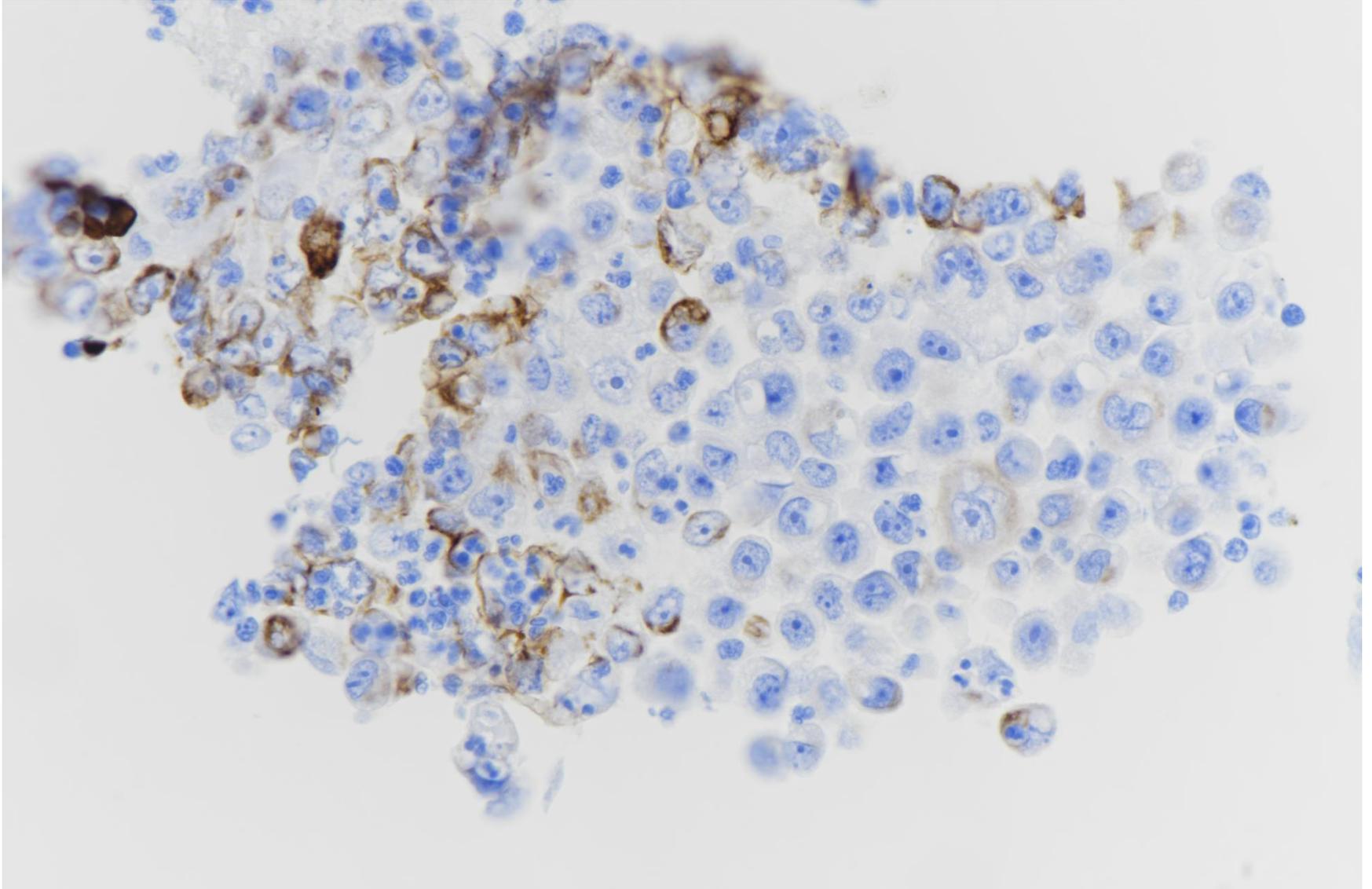
New immunocytochemical panel:

- **CK7**
- **CK19**
- **PAX8**
- **Vimentin**

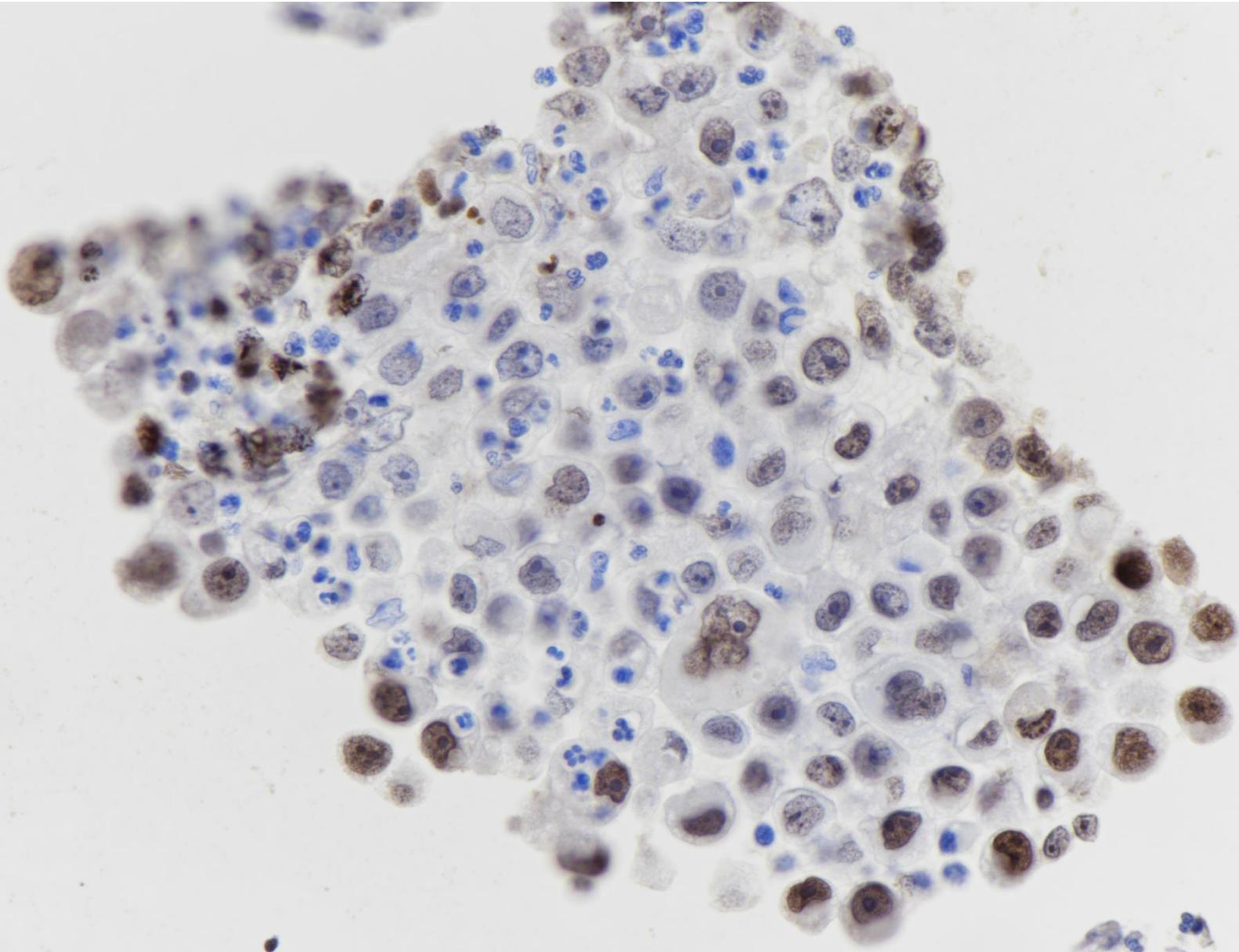
# Immunocytochemistry, CK7 (400x)



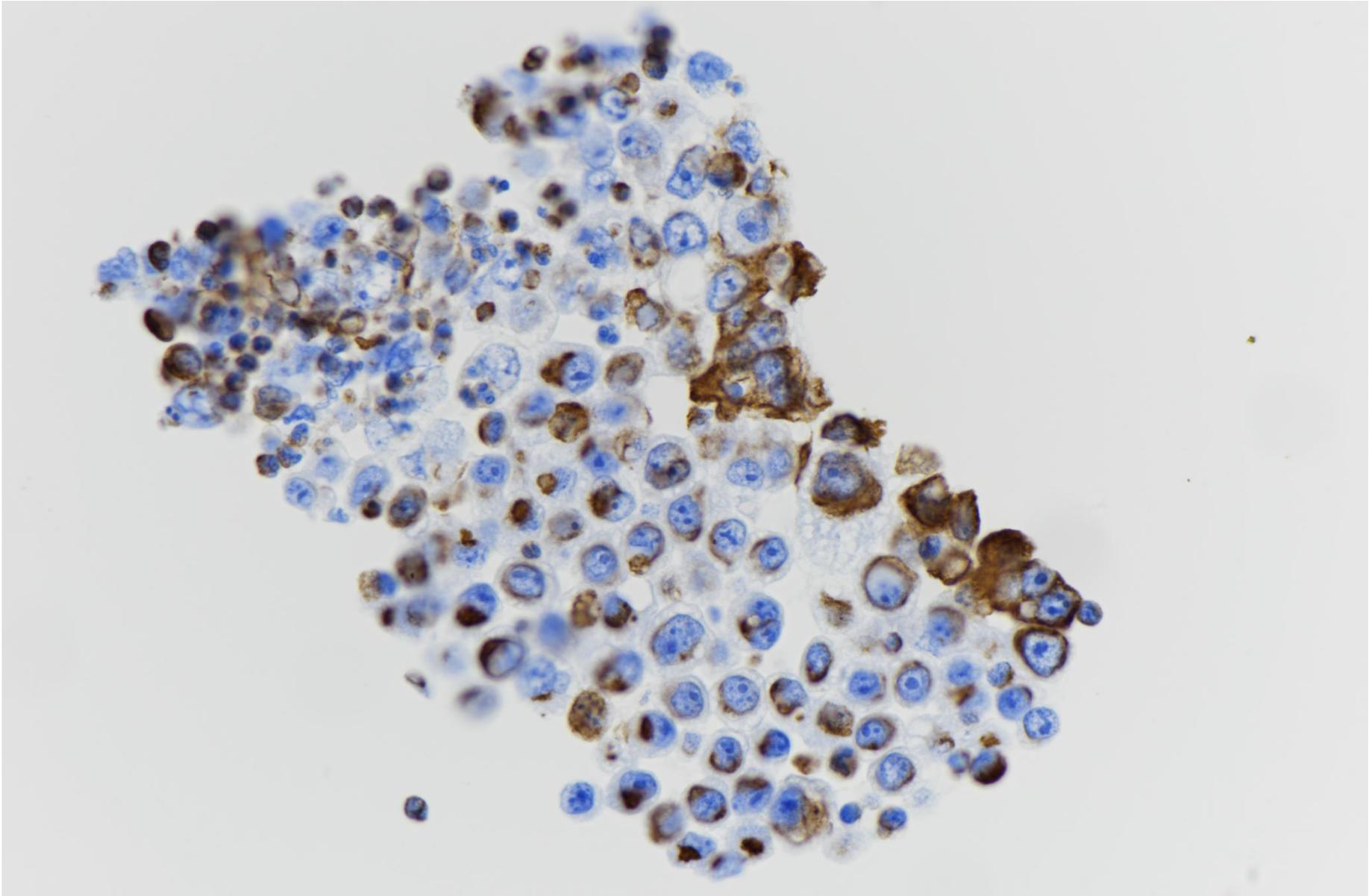
# Immunocytochemistry, CK19 (400x)



# Immunocytochemistry, PAX8 (400x)



# Immunocytochemistry, Vimentine (400x)



# Definitive Cytological Diagnostic

**Lymph node metastasis of Collecting  
Duct Carcinoma (of Bellini)**

# Collecting Duct Carcinoma (of Bellini)

- Is a rare neoplasm: 1-2% of renal tumours.
- Wide patient age range: 13-85 years (median 43-63 y).
- ♂/♀ = 2:1

# Collecting Duct Carcinoma (of Bellini)

- Has the poorest prognosis
- Distant metastases in most patients either **at presentation** or **after nephrectomy**
- Metastases **are usually to lymph nodes**, in liver, lungs, bones or contralateral kidney

# Cytological description

- ✓ Aspirate may contain cohesive nests of tumor cells or isolated cells with glandular features
- ✓ Eosinophilic, vacuolated cells with intracytoplasmic mucin
- ✓ Nuclei are large, irregular, hyperchromatic, with vesicular chromatin and large nucleoli
- ✓ Ductal / tubular differentiation with benign, dysplastic and malignant features, **prominent neutrophils**

# Collecting Duct Carcinoma (of Bellini)

## Immunohistochemistry:

- **PAX8 : +**
- High-molecular weight cytokeratins: **CK19, 34βE12: +**
- **CK7: +**
- **CEA: +**
- **Ulex europaeus agglutinin (UEA): +**
- **Vimentin: + / -**
- **CD10 negative!**

# **CONCLUSION**

## **Collecting Duct Carcinoma (of Bellini)**

Rare cytodiagnostic challenge!

When the cytological diagnosis is considered  
→ necessary to perform immunocytochemistry  
and correlate the clinical history and imaging  
studies.

# References

- WHO Classification of Tumours of the Urinary System and Male Genital Organs, 4th Edition. 2016: 29, 30.
- Hiroyuki Ohsaki, Eiichiro Hirakawa, Yoshio Kushida, Kyuichi Kadota, Masashi Ishikawa and Reiji Haba. Cytological Features of Carcinoma of the Collecting Ducts of Bellini in Voided Urine Cytology. Diagnostic Cytopathology 2009; Vol 37 (No 9): 676-679.
- Gia-Khanh Nguyen and G. Berry Schumann. Cytopathology of Renal Collecting Duct Carcinoma in Urine Sediment. Diagnostic Cytopathology 1997; Vol 16 (No 5): 446-449.