

Epidermotropic Metastatic Prostate Adenocarcinoma With Florid Squamous Transformation/Differentiation And Associated Acantholysis. An Unusual Clinicopathologic Entity.

Sara Hoffman, D.O.¹, Narciss Mobini, M.D.^{2, 3}

¹UC Davis Health, Department of Pathology and Laboratory Medicine, Sacramento, CA, ²Kirk Kerkorian School of Medicine, Las Vegas, NV and ³Associated Pathologists Chartered/Quest Diagnostics, Las Vegas, NV

**UC DAVIS
HEALTH**

Department of Pathology
and Laboratory Medicine

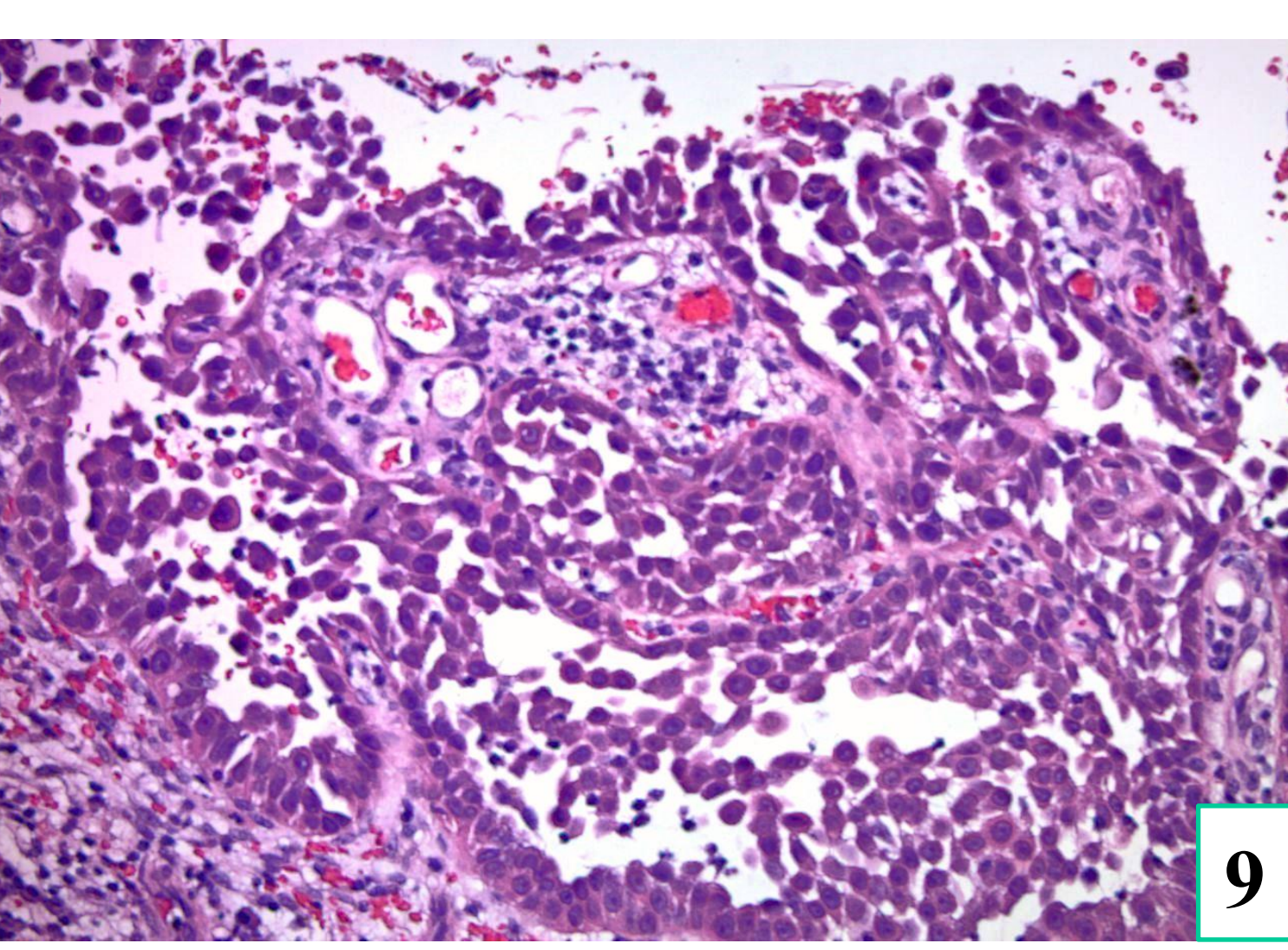
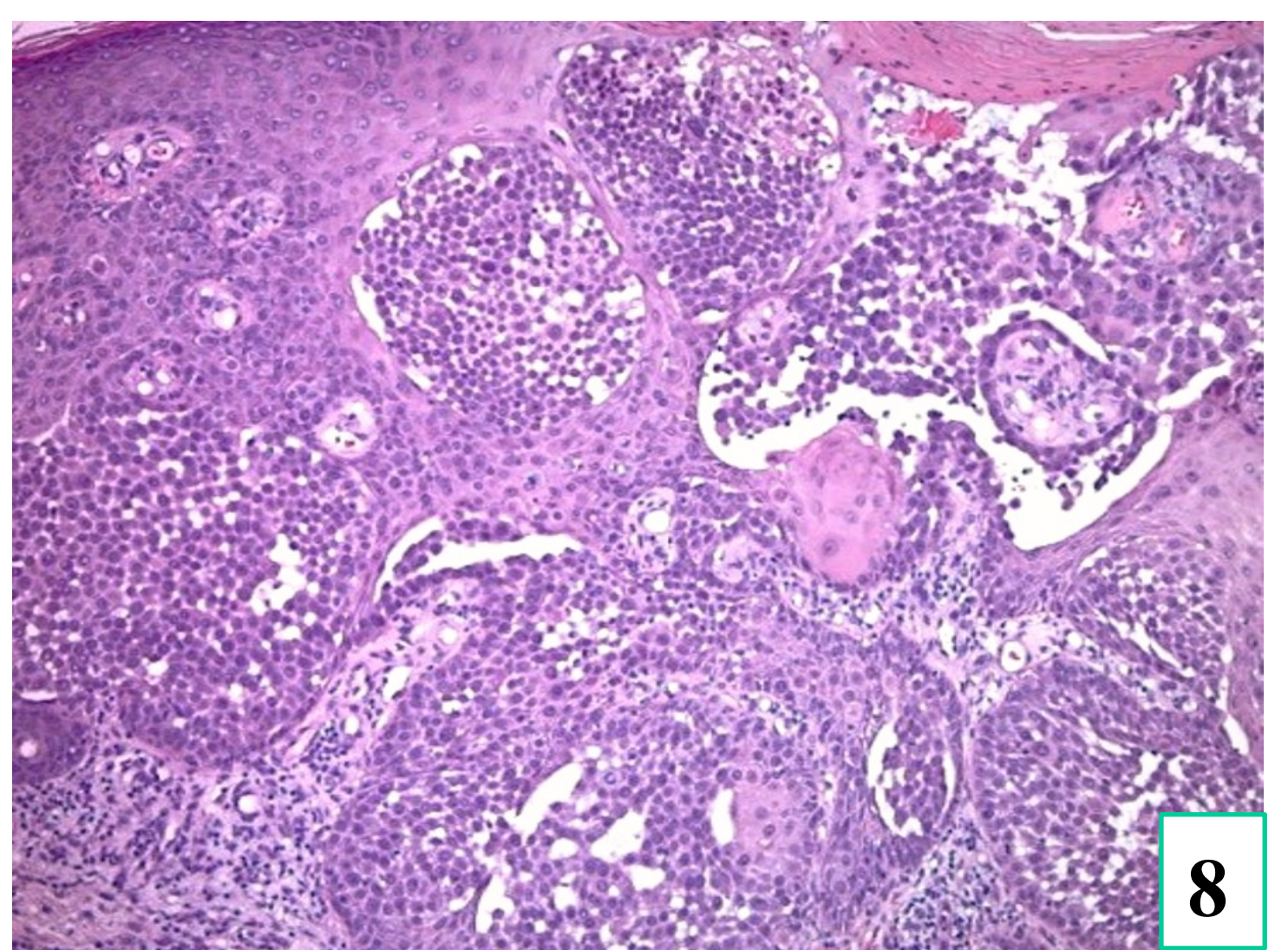
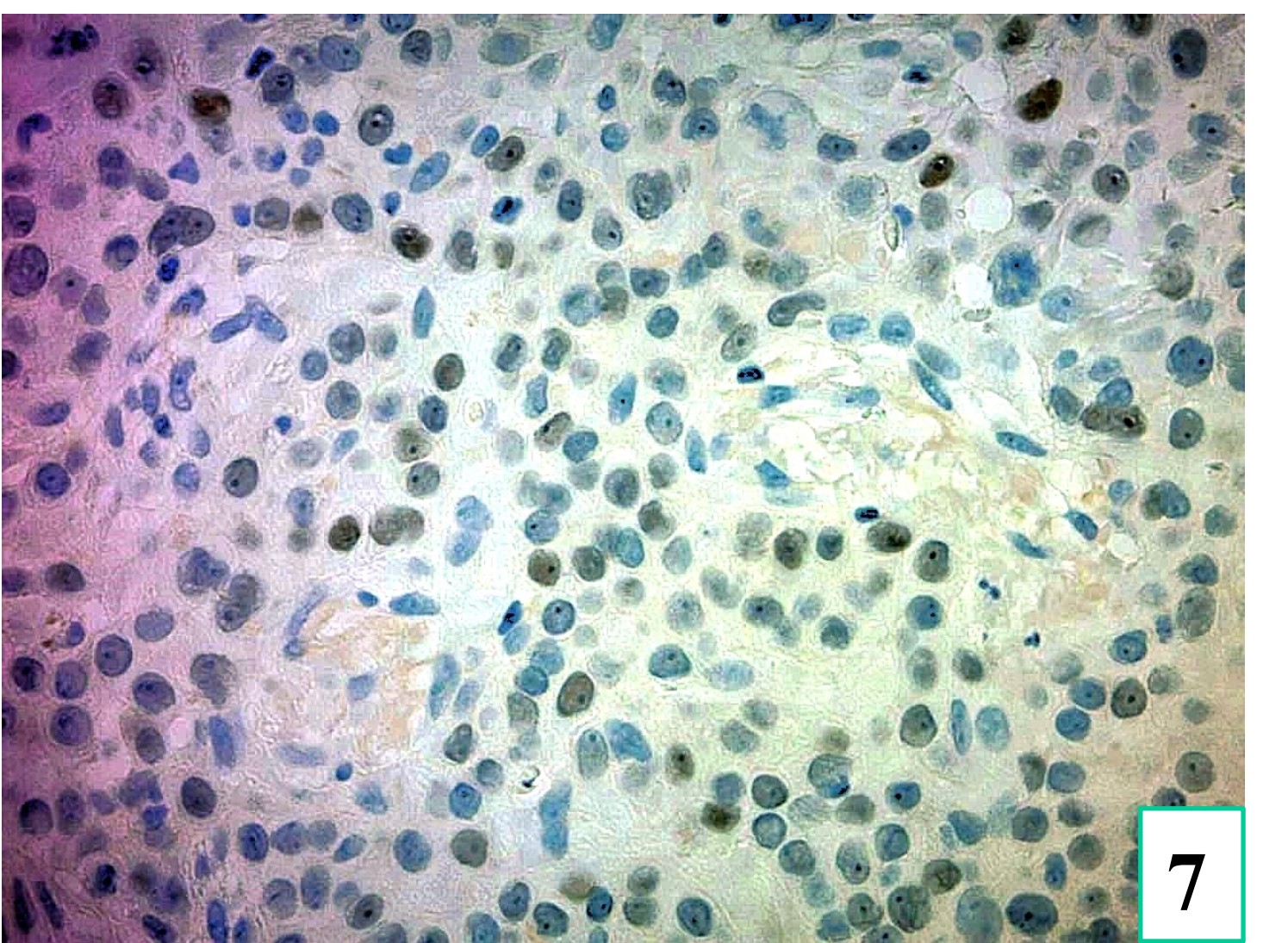
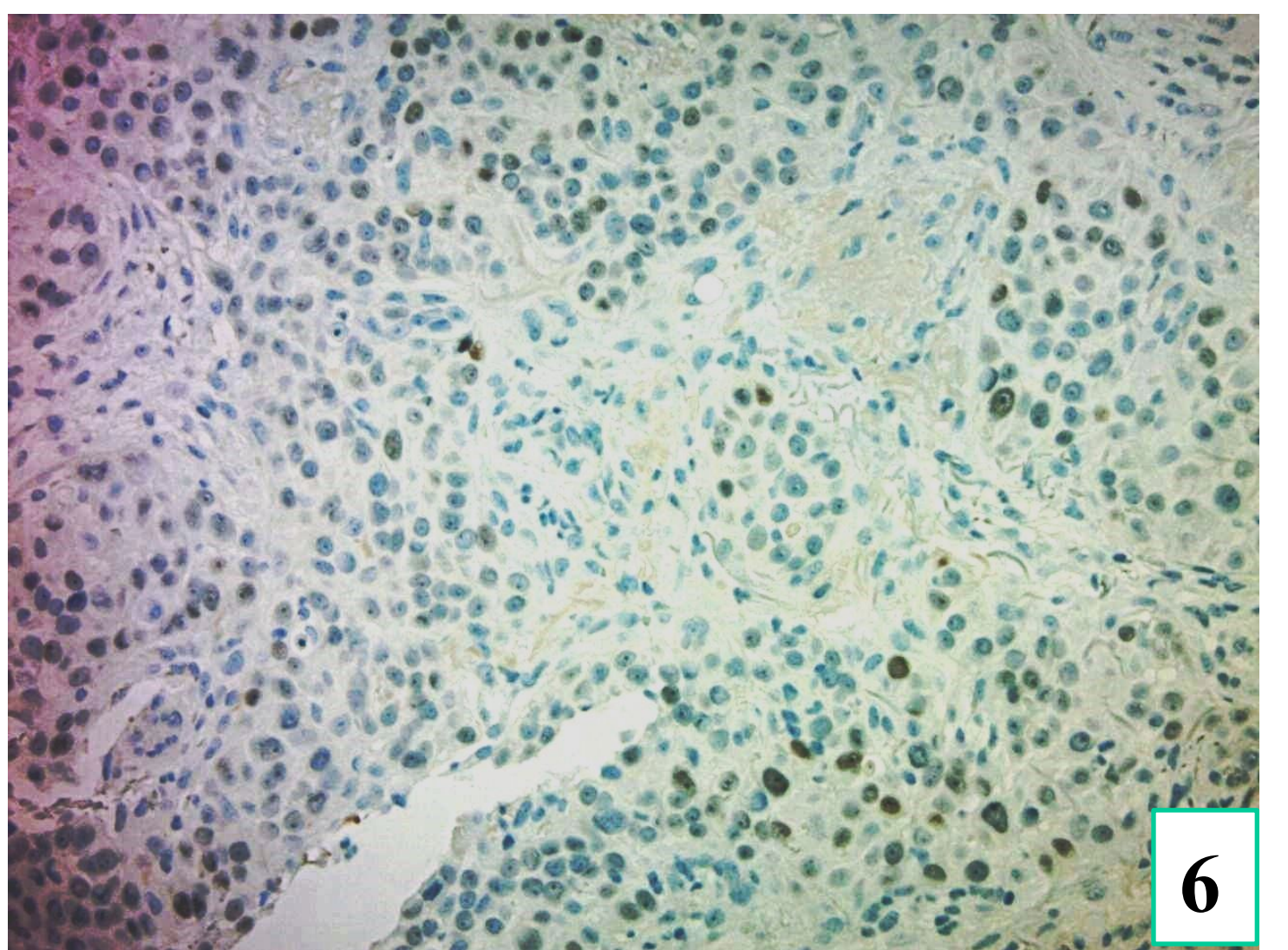
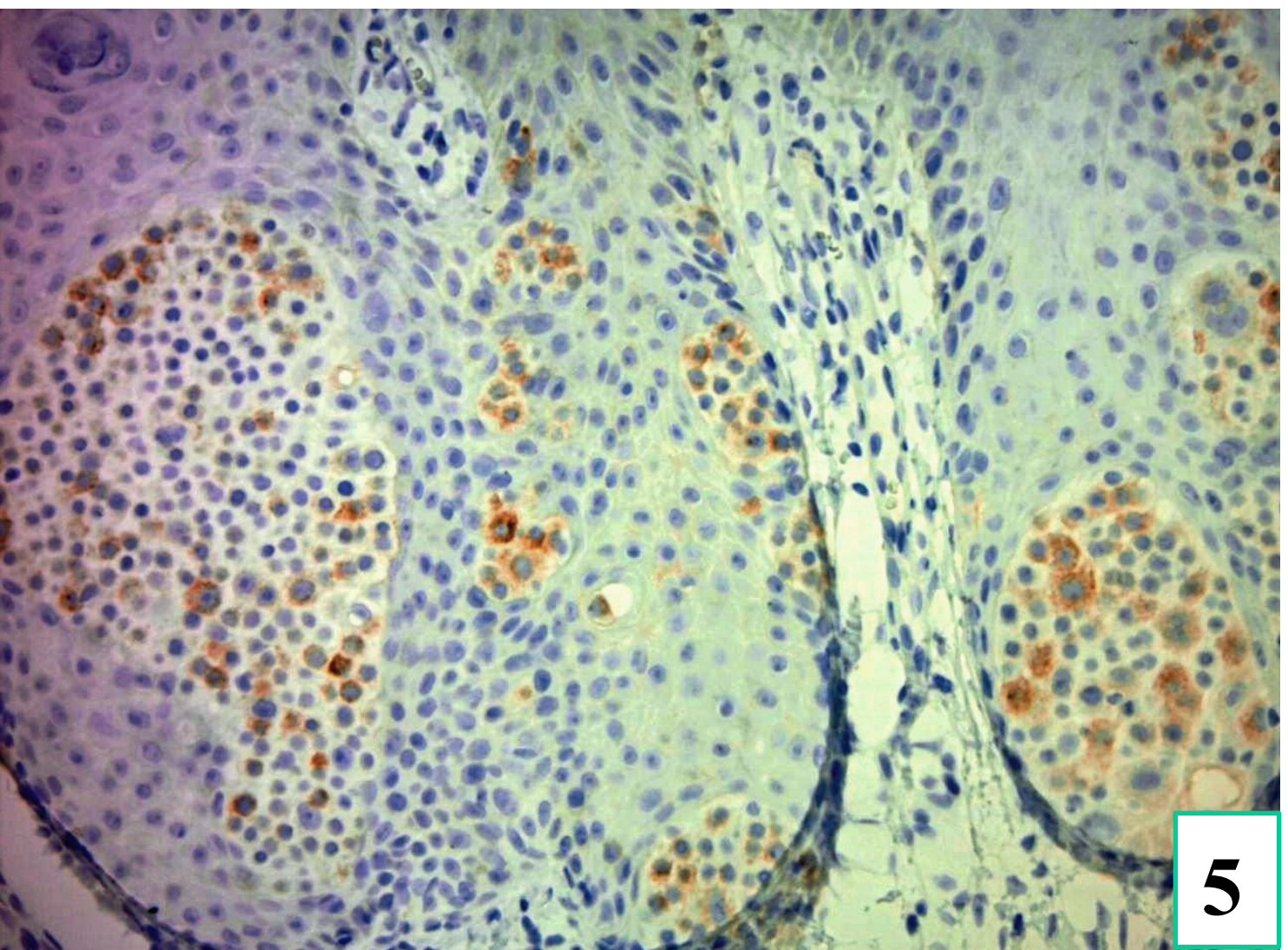
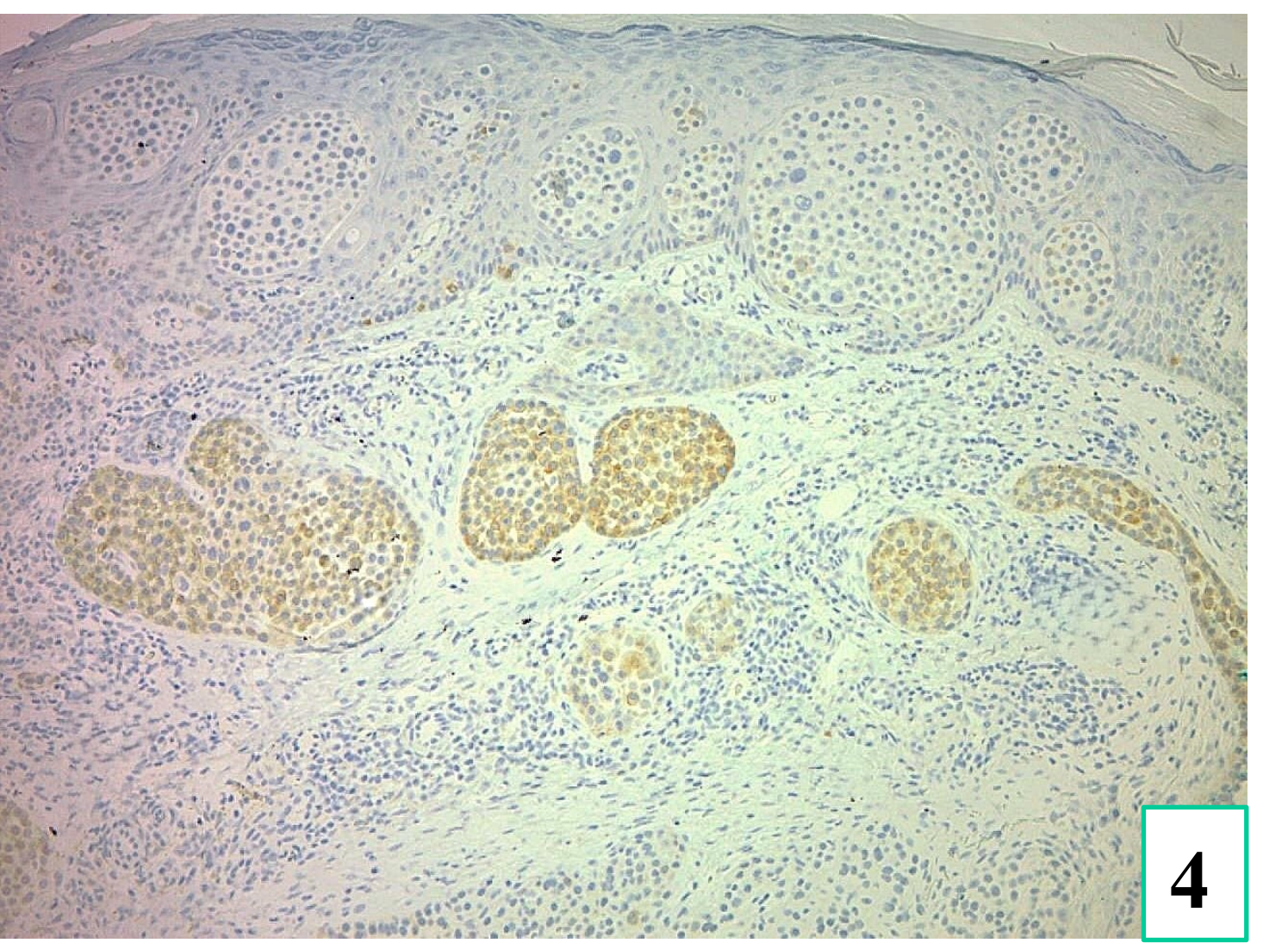
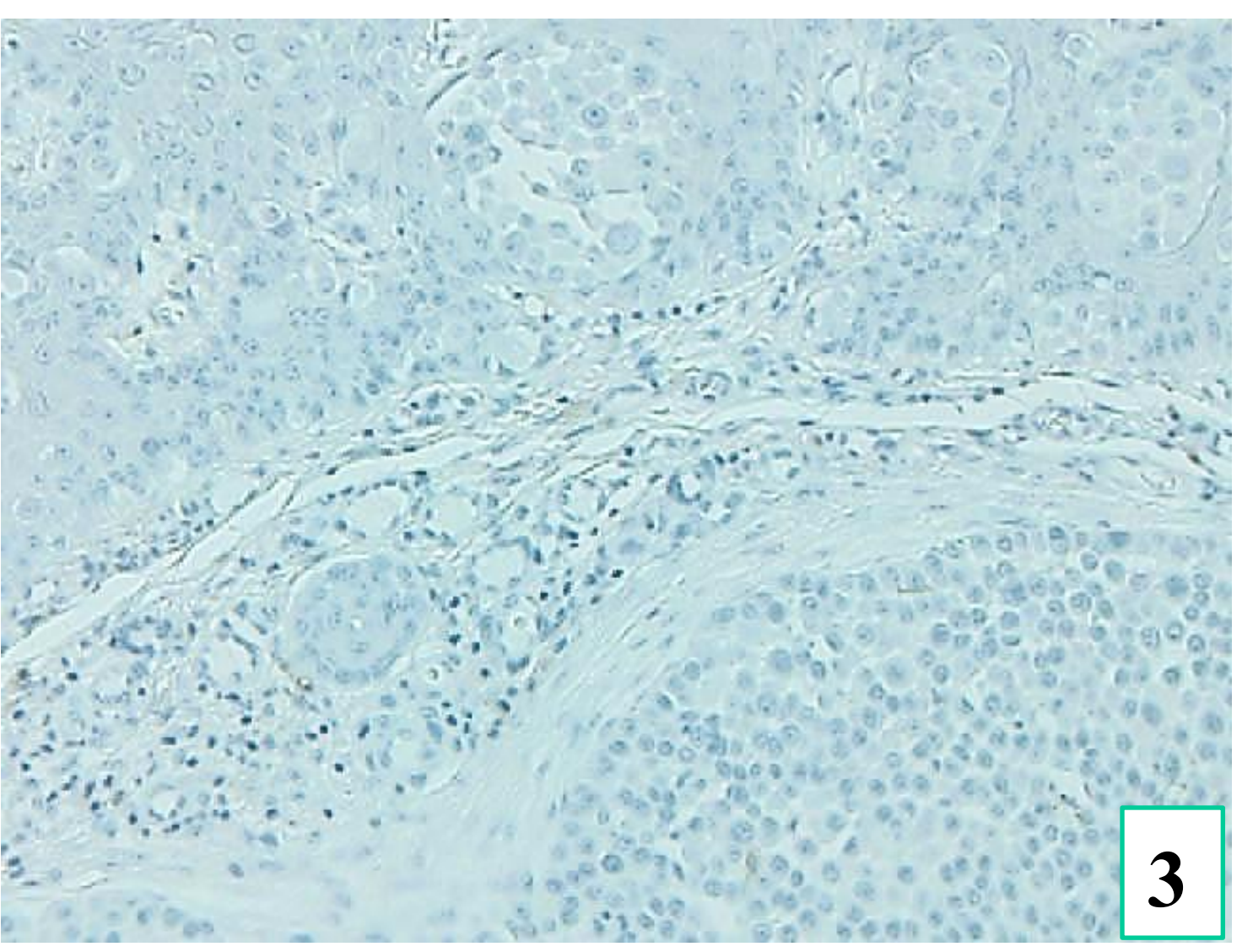
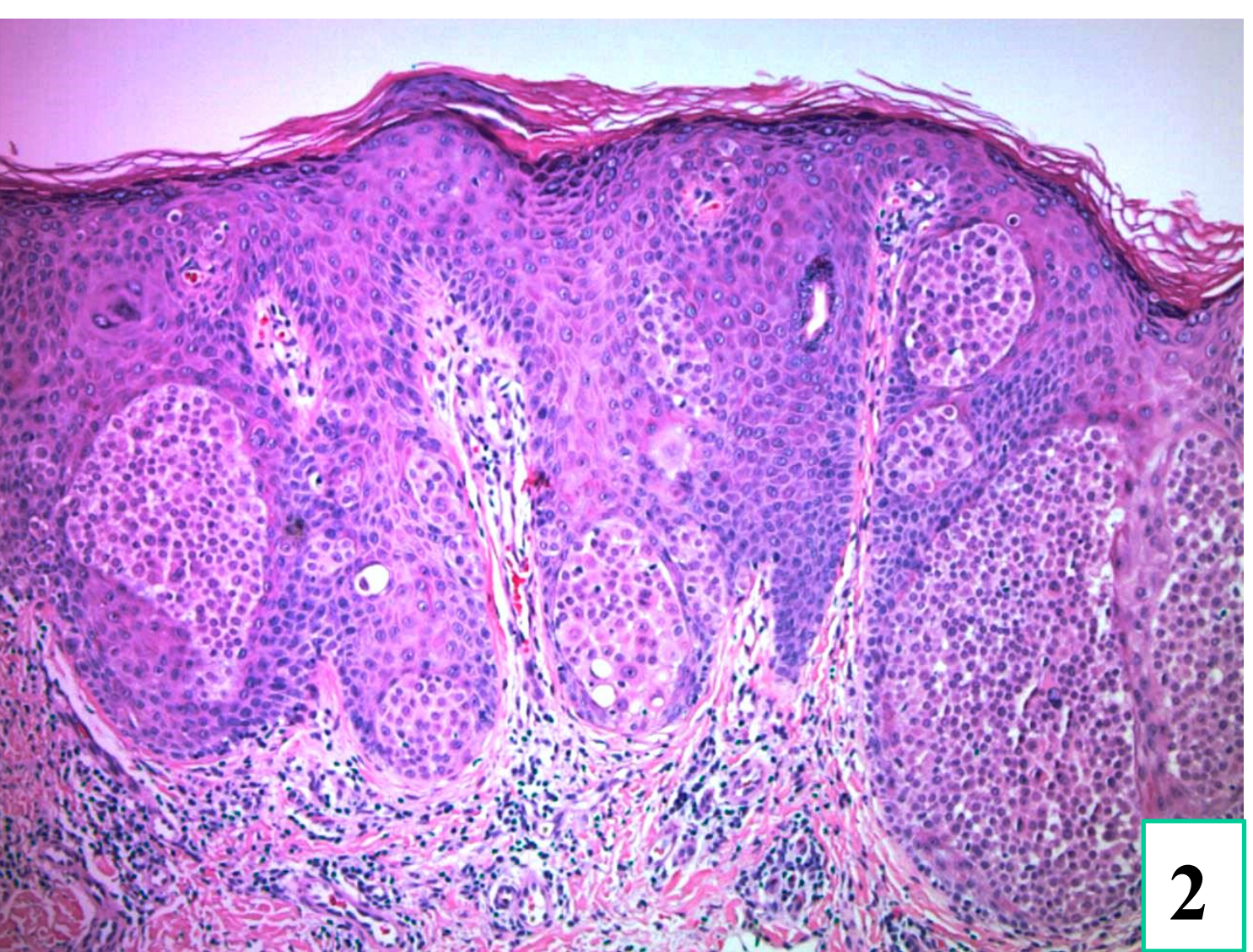
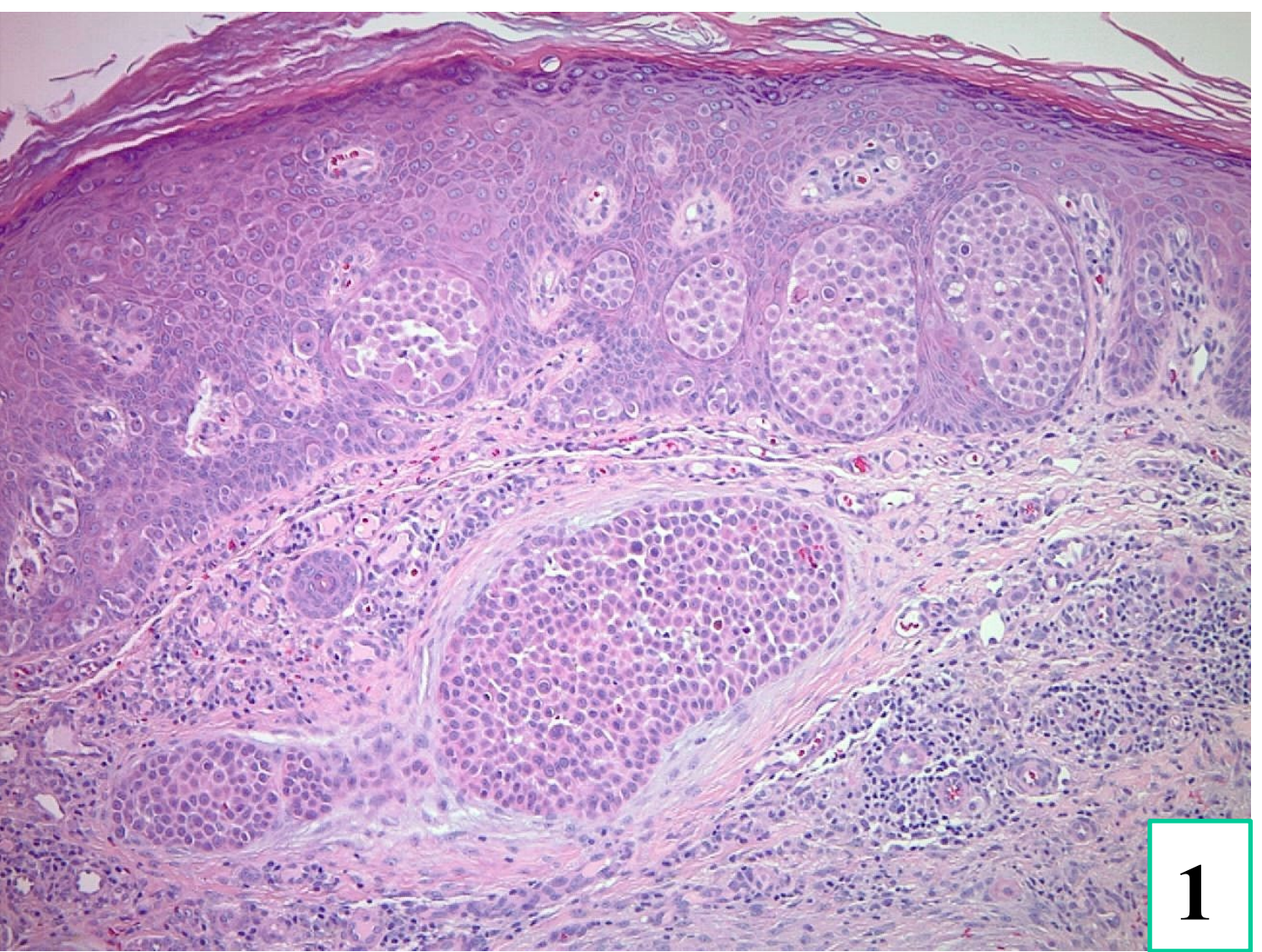
Background

- Prostate adenocarcinoma is the most common carcinoma in men, however, its cutaneous metastasis is rare, accounting for less than 1% of metastatic cutaneous carcinomas. (1)
- Squamous differentiation is very rare in prostate cancer. Only rarely, in metastatic prostate adenocarcinoma, squamous transformation may occur, especially when hormonal therapies are part of the systemic treatment. (2)
- We report an unusual presentation of cutaneous metastatic prostate adenocarcinoma with marked squamous differentiation/transformation and acantholysis, mimicking squamous cell carcinoma.
- IHC studies revealed negative PSA and PAP reactions, and positive PSMA and NKX3.1 staining, confirming the prostatic origin.

Case Report

- A 70-year-old male presented with a new-onset "keratotic appearing" plaque on his left shin.
- The biopsy showed a malignant epithelial neoplasm with prominent epidermotropic morphology, comprised of discrete nests and aggregates of cohesive epithelial cells in the dermis and epidermis, with enlarged vesicular nuclei, prominent nucleoli and pale eosinophilic to clear cytoplasm, typical and atypical mitoses, and foci of discohesiveness/acantholysis.
- Not typical for a primary carcinoma, further inquiry of patient history revealed a history of prostate adenocarcinoma four years prior, treated by radical prostatectomy, hormonal therapy and adjuvant radiotherapy.
- Histopathologically not typical for a metastatic prostate carcinoma, an extensive IHC panel was performed, showing positive reactions for CK AE1/AE3, and negative for CK7, CK20, CK 5/6, S100, and CEA. PSA and PSAP yielded negative results, while NKX3.1 and PSMA reacted positive, which confirmed prostatic origin of the neoplastic cells.
- The unusual features were squamoid features and acantholysis.
- Skin re-excision showed residual metastatic lesion, which was followed by local radiation.

Figures



- Poorly differentiated epidermotropic metastatic carcinoma. 100x, H&E.
- Poorly differentiated epidermotropic metastatic carcinoma. 100x, H&E.
- Negative PSA, 400X.
- Positive PSMA (cytoplasmic and membranous), 100X.
- Positive PSMA (cytoplasmic and membranous), 400X.
- Positive NKX3.1 (nuclear), 100X.
- Positive NKX3.1 (nuclear), 400X.
- Metastatic poorly differentiated epidermotropic prostate carcinoma with prominent acantholysis in the skin re-excision, 100x.
- Metastatic poorly differentiated epidermotropic prostate carcinoma with prominent acantholysis in the skin re-excision, 400x.

Discussion

- Our case is a highly unusual presentation of metastatic prostate adenocarcinoma in regards to anatomic location, histopathologic, and IHC features.
- Poorly-differentiated and high grade prostatic adenocarcinomas may show a lower sensitivity for PSA and PSAP, compared to well-differentiated ones where sensitivity for both markers is almost 100%. This may partially explain the unusual IHC pattern in our case. (3)
- NKX3.1 immunostain is highly sensitive for prostate carcinoma, that helped confirm the diagnosis in our case, along with PSMA.
- Squamous differentiation/transformation is a very rare phenomenon in prostate cancer.
- There are previously reported cases of prostate carcinoma with squamous transformation, associated with systemic hormonal therapy. (2, 4)
- Comprehensive genomic testing and molecular profiling of rare reported cases of metastatic SCC-transformed from prostatic adenocarcinoma, indicate that SCC may arise from multipotential prostate adenocarcinoma cells, affected by antecedent hormonal therapy and radiotherapy. (2, 4, 5, 6)

Conclusion

- When evaluating metastatic cutaneous carcinomas displaying epidermotropism and squamoid appearances, it is essential to maintain a high index of suspicion and inquire about a history of prostate carcinoma.
- This history is especially relevant if hormonal therapy was utilized as part of the patient's management.

References

- Choate EA, Nobori A, Worswick S. Cutaneous Metastasis of Internal Tumors. *Dermatol Clin*. 2019;37(4):545-554. doi:10.1016/j.det.2019.05.012.
- Autio K, McBride S. Oligometastatic squamous cell transformation from metastatic prostate adenocarcinoma treated with systemic and local therapy: A case report. *J Immunother Precip Oncol*. 2022; 5:79-83. Doi: 1036401/JPO-22-4.
- Torenbeek R, Lagendijk JH, Van Diest PJ, Brill H, van de Molengraft FJ, Meijer CJ. Value of a panel of antibodies to identify the primary origin of adenocarcinomas presenting as bladder carcinoma. *Histopathology*. 1998 Jan;32(1):20-7. doi: 10.1046/j.1365-2559.1998.00328.x.
- Lau HD, Clark M. Metastatic squamous cell carcinoma transformed from prostatic adenocarcinoma following androgen deprivation therapy: A case report with clinicopathologic and molecular findings. *Diagn Cytopathol*. 2020 Dec;48(12):E14-E17. doi: 10.1002/dc.24539.
- Zhang C, Jia Y, Kong Q. Case report: Squamous cell carcinoma of the prostate-a clinicopathological and genomic sequencing-based investigation. *Pathol Oncol Res*. 2023 Nov 28;29:1611343. doi: 10.3389/pore.2023.1611343. PMID: 38089646; PMCID: PMC10713708.
- Dizman N, Salgia M, Ali SM, Wu H, Arvanitis L, Chung JH, Pal SK. Squamous Transformation of Prostate Adenocarcinoma: A Report of Two Cases With Genomic Profiling. *Clin Genitourin Cancer*. 2020 Jun;18(3):e289-e292. doi: 10.1016/j.clgc.2019.11.020.

Disclosures

I do not have any relevant financial relationships to disclose.