



International Academy of Pathology
Malaysian Division

FINAL REPORT

QUALITY ASSURANCE PROGRAM
GENERAL DIAGNOSTIC HISTOPATHOLOGY
CYCLE 01/2024

NOTES FROM THE COORDINATOR

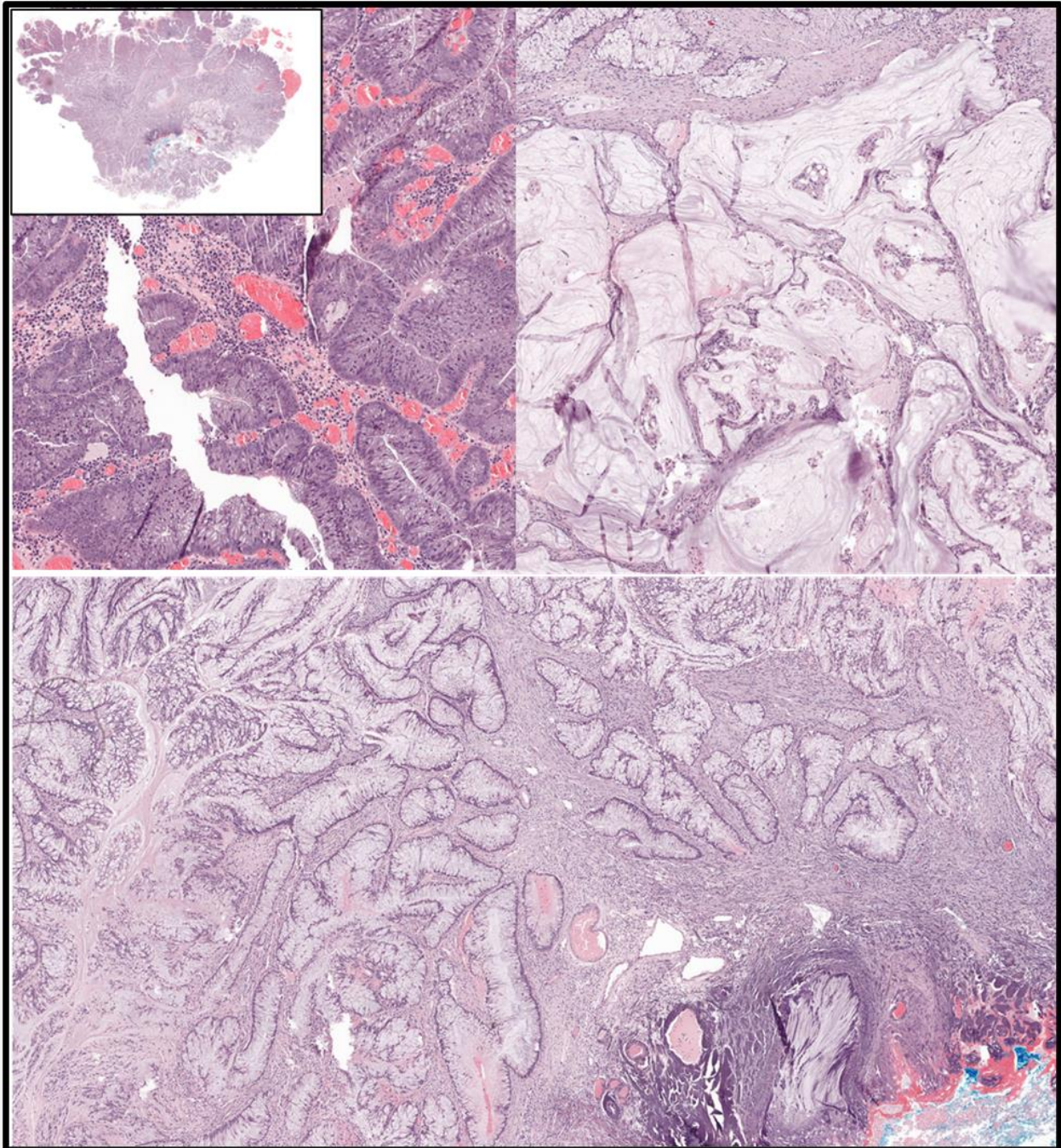
1. For this cycle 01/2024, a total of 30 institutions responded online by the closing date of 15 June 2024.
2. Excerpts of previously circulated information about this quality assurance program are reproduced here:
 - **IAP-MD QAP provides a platform via the evaluation reports to compare and identify diagnostic insufficiency based on the outcomes of submitted diagnoses and targeted diagnoses.**
 - **In the evaluation reports of each cycle, the targeted diagnosis for each case is provided, followed by a tabulated list of diagnoses submitted by participating laboratories and followed by discussion and possible differential diagnoses on the case.**
 - **Evaluation of performance of each laboratory is conducted by participating laboratory by comparing own submitted diagnoses with the diagnoses provided in the evaluation reports. Evaluation of performance shall be the responsibility of each participating laboratory.**
3. Any queries regarding this final report for cycle 01/2024 could be directed to Dr. Ch'ng Ewe Seng, e-mail: iapmdgap@gmail.com.
4. The coordinator would like to acknowledge the contributions from Prof. Emerita Dr. Nor Hayati Othman, Prof. Dato Dr. Norain Karim, Datin Dr. Nik Raihan Nik Mustapha, Dr. Razmin Ghazali, Dr. Noraini Mohd Dusa, PM Dr. Nor Haizura Abd Rani, Dr. Nurul Akmar Misron, Dr Khairunisa binti Ahmad Affandi and Dr Nurwahyuna Binti Rosli.

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Case 1: A 68-year-old woman. Colonic polypectomy.

Targeted Diagnosis: **Serrated adenocarcinoma arising from sessile serrated lesion with dysplasia.**



Submitted Diagnoses by Participating Institutions	Number	
Mucinous adenocarcinoma/Adenocarcinoma with mucinous differentiation with tubulovillous adenoma/ villous adenoma/adenomatous polyp with high grade dysplasia	15	Acceptable
Mucinous carcinoma/Adenocarcinoma with mucinous differentiation arising from Peutz-Jeghers polyp with foci of high-grade dysplasia	3	Acceptable
Mucinous carcinoma in a sessile serrated polyp/adenoma	2	Acceptable
Mucinous adenocarcinoma, arising from traditional serrated adenoma	1	Acceptable
Mucinous adenocarcinoma/Adenocarcinoma with mucinous differentiation arising from polyp.	4	Acceptable
Adenocarcinoma/ Adenocarcinoma with mucinous differentiation/ Mucinous carcinoma	4	Acceptable
Traditional serrated adenoma with focal high-grade dysplasia.	1	

Educational notes:

1. This polypoid mass shows overall crypt distortion with crypt crowding, complex branching, and villous architecture accompanied by a varied morphologies of dysplasia including an adenomatous dysplasia on the top. At the base, crypt dilation and irregularly shaped crypts are observed. There is definite invasion beyond the muscularis mucosa as evidenced by proximity of the crypts to the dilated blood vessels in the submucosa. In addition, an area of mucinous component composed of pools of mucin with floating dysplastic epithelial clusters is observed. These features are consistent with a serrated adenocarcinoma arising from sessile serrated lesion with dysplasia.
2. Serrated adenocarcinoma (SAC) is a distinct type of adenocarcinoma associated with malignant transformation of serrated polyps, including sessile serrated lesions and traditional serrated adenomas. SAC is defined by morphological similarities with serrated polyps according to the 5th edition WHO Classification. Makinen specifically defined SAC as adenocarcinoma with the following features: epithelial serrations, clear or eosinophilic cytoplasm, abundant cytoplasm, vesicular nuclei, absence of or <10% necrosis of the total surface area, mucin production, and cell balls and papillary rods in the mucin.
3. The underlying sessile serrated lesion (SSL) of this mass is recognized by the overall distorted crypt architecture. Dysplastic component in SSL with dysplasia shows complex crypt architecture with cytological atypia appearing as conventional intestinal adenomatous dysplasia, serrated dysplasia, minimal deviation dysplasia and dysplasia, not otherwise specified.
4. Although there is mucin production, SAC is distinguished from mucinous adenocarcinoma as the latter is designated only if more than 50% of the lesion is composed of pools of extracellular mucin that contain overt malignant epithelium.

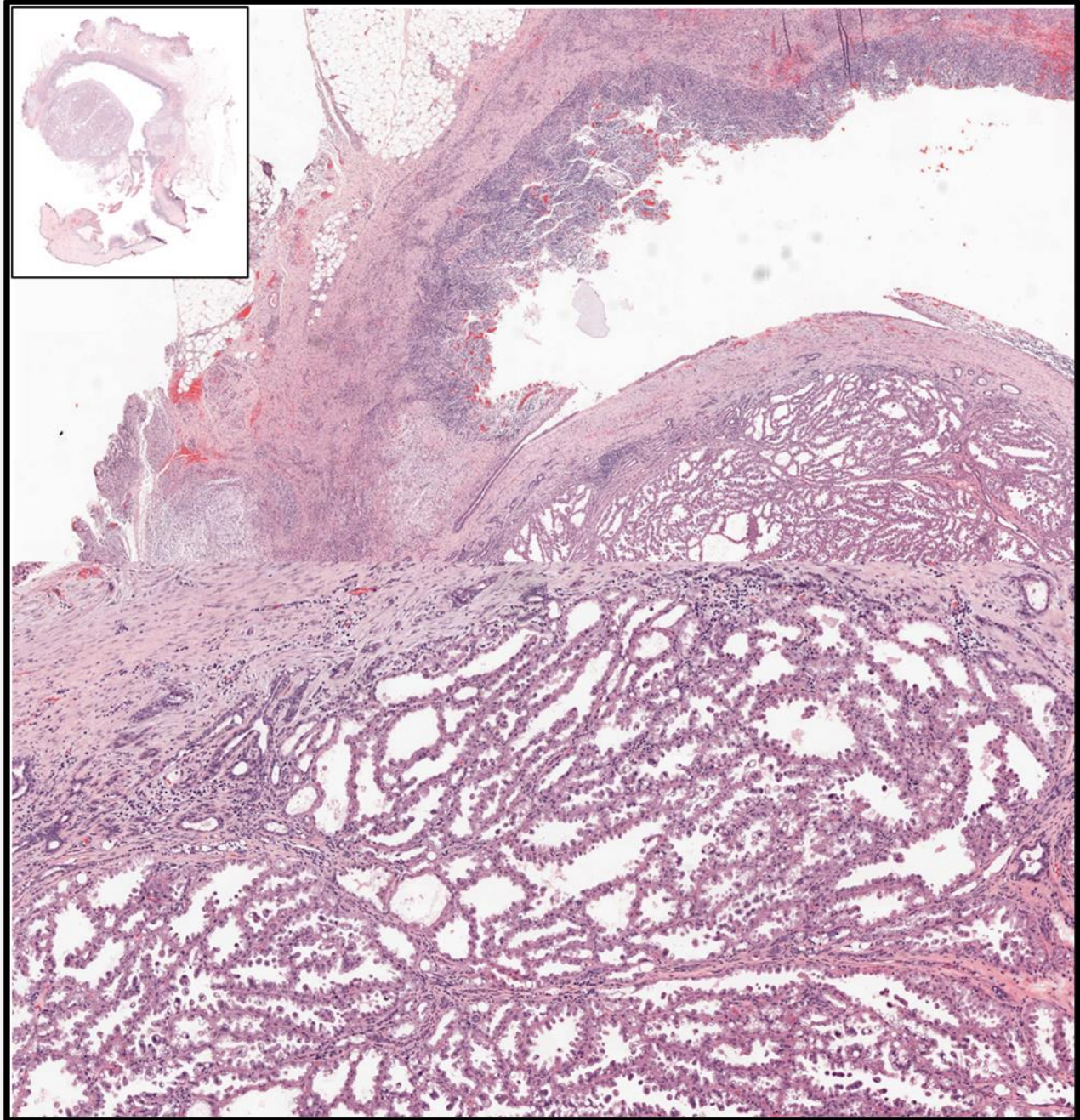
Reference:

1. WHO Classification of Tumours Editorial Board. Digestive system tumours: WHO Classification of Tumours, 5th ed.; IARC: Lyon, France (2019).

2. Mäkinen, M. J. (2007). Colorectal serrated adenocarcinoma. *Histopathology*, 50(1), 131-150.

Case 2: A 35-year-old woman with a breast lump.

Targeted Diagnosis: Lactational adenoma in a galactocele



Submitted Diagnoses by Participating Institutions	Number	
Lactating adenoma with ruptured galactocele	11	Acceptable
Lactating adenoma	13	Acceptable
Lactating adenoma with granulomatous inflammation/ foreign body giant cell reaction	4	Acceptable
Lactating adenoma with fat necrosis	1	Acceptable
Galactocele previously ruptured with lactational changes	1	

Educational notes:

1. There is a ruptured galactocele with surrounding foamy histiocytic infiltrates mixed with histiocytes and lymphoplasmacytic infiltrates. Within this galactocele, there is a circumscribed lactating adenoma composed of expanded mammary acini separated by thin fibrous septa. The ductal epithelium lining the acini shows marked lactational changes with vacuolated cytoplasm.
2. Lactating adenoma is most encountered in the third trimester of pregnancy and less frequently during the postpartum period.
3. Histologically, during the first and second trimesters, lactating adenoma resembles tubular adenoma. Lactating adenoma differs from fibroadenoma with secretory activity as the latter shows preserved fibroepithelial architecture, prominent stroma and limited focal secretory activity.

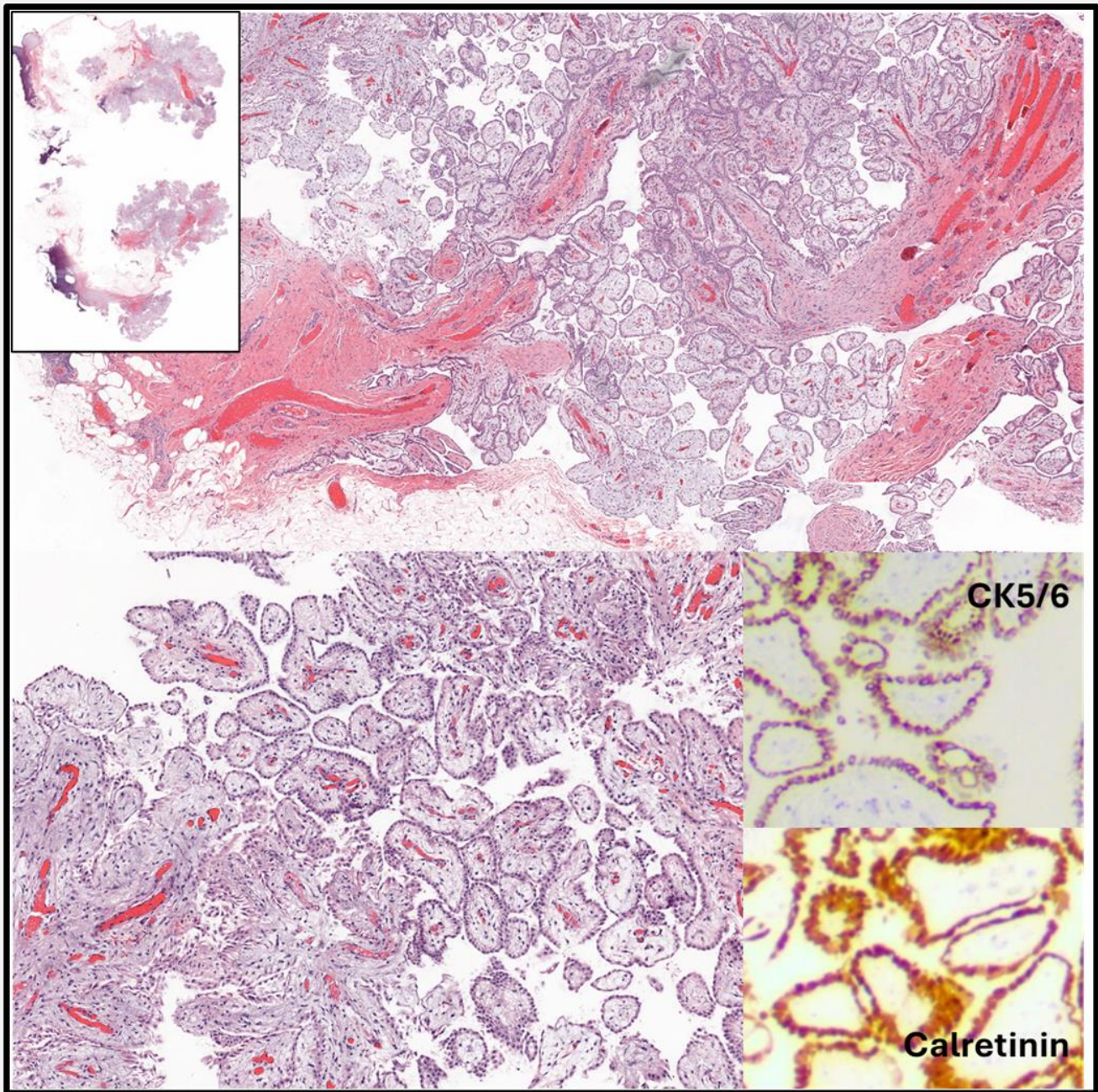
Reference

1. WHO Classification of Tumours Editorial Board. Breast Tumours: WHO Classification of Tumours, 5th ed.; IARC: Lyon, France (2019).

Case 3

Case 3: A 45 -year-old man with a 5mm peritoneal nodule found incidentally during hernial repair.
IHC provided: calretinin and CK5/6.

Targeted Diagnosis: Well-differentiated papillary mesothelial tumor



Submitted Diagnoses by Participating Institutions	Number	
Well-differentiated papillary mesothelial tumor, For BAP1 IHC for confirmation.	27	Acceptable
Well-differentiated papillary mesothelioma	2	Acceptable
Papillary mesothelial hyperplasia	1	

Educational notes:

1. This 10mm-tumor is composed of papillae with myxoid cores containing small, congested blood vessels. These papillae are covered by a layer of cuboidal to flattened epithelium. The nuclei of the epithelium are small, round to oval, and contain occasional inconspicuous nuclei without mitosis. This tumor is attached to the fibro-fatty tissue without invasion. The covering epithelium is positive for calretinin and CK5/6. These features are consistent with well-differentiated papillary mesothelial tumor.
2. Well-differentiated papillary mesothelial tumor (WDPMT, formerly called well-differentiated papillary mesothelioma, is often an incidental surgical finding in peritoneum. This tumor is unifocal and small (<2cm), characterized by papillae with hyalinized to myxoid cores lined by a single layer of bland mesothelial cells.
3. This tumor differs from mesothelioma by absence of invasion into the underlying soft tissue. It differs from mesothelial hyperplasia associated with inflammation by formation of discrete nodules. Histologically, the papillae of WDPMT are slender with rare or absence of inflammatory infiltrates.
4. WDPMTs may show invasive foci, characterized by confluent papillary growth and/or mesothelial nests/cords within papillary stroma confining to the WDPMT. In such situation, differentiation from mesothelioma in situ with WDPMT-like morphology and/or early epithelioid mesotheliomas with WDPMT-like foci must be considered. BAP1 immunohistochemistry should be performed for lesions discovered during clinical workup for effusion or associated with multifocal or diffuse serosal involvement. Loss of BAP1 supports a diagnosis of WDPMT-like mesothelioma or mesothelioma in situ

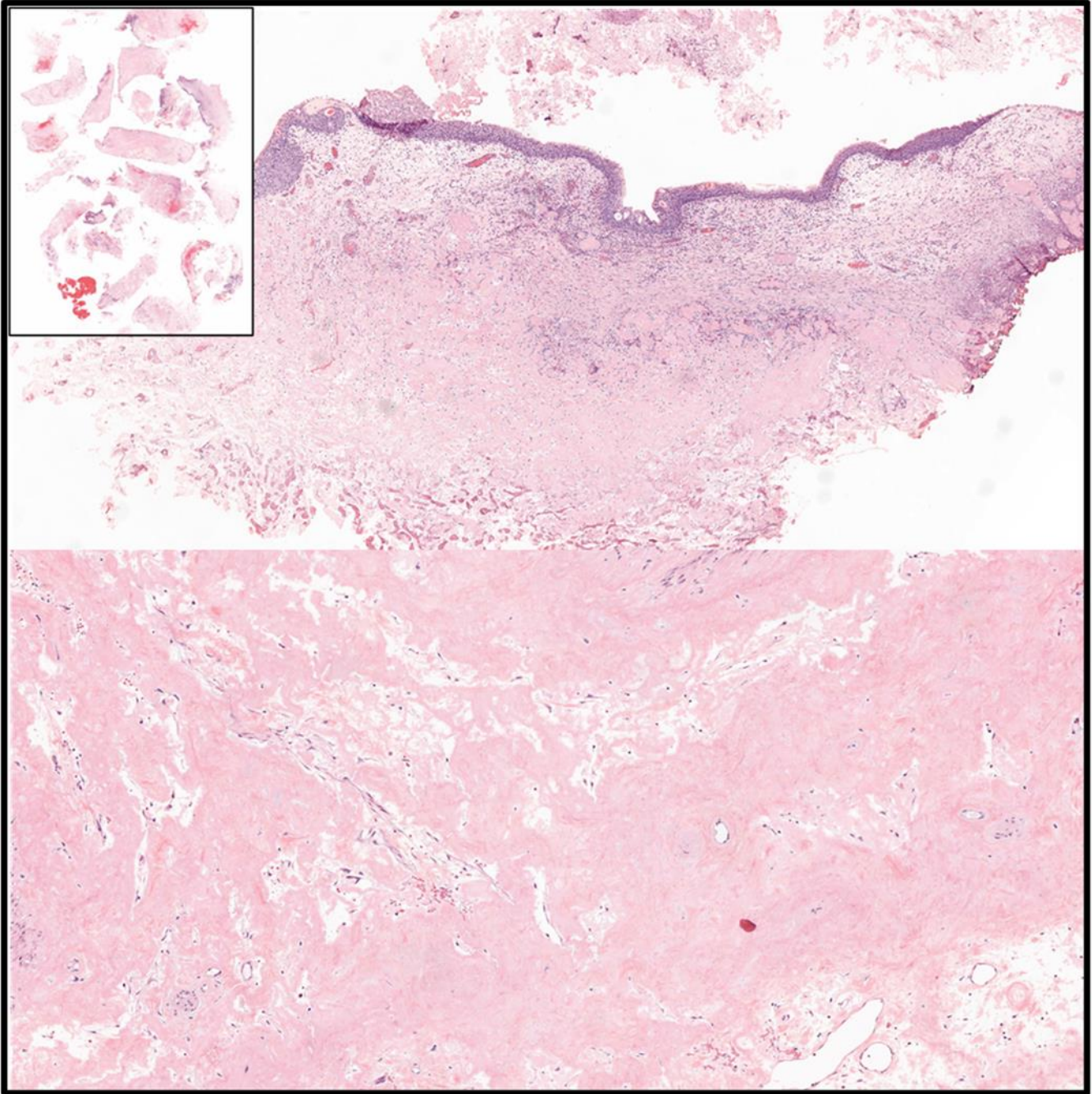
Reference

1. Husain, Aliya N., et al. "Guidelines for pathologic diagnosis of mesothelioma: 2023 update of the consensus statement from the international mesothelioma interest group." Archives of Pathology & Laboratory Medicine (2024).

Case 4

Case 4: A 60-year-old woman presented with hematuria. Bladder biopsy.

Targeted Diagnosis: **Bladder amyloidosis and cystitis cystica**



Submitted Diagnoses by Participating Institutions	Number	
Amyloidosis with cystitis cystica/ cystitis glandularis/ chronic cystitis/ acute on chronic cystitis	23	Acceptable
Amyloidosis	7	Acceptable

Educational notes:

1. There are urothelial tissue fragments with diffuse deposition of amorphous and pale eosinophilic materials in the lamina propria, consistent with amyloid. The urothelial epithelium shows reactive proliferation associated with focal cystic change and chronic and acute inflammatory infiltrates. These features are those of bladder amyloidosis and cystitis cystica.
2. Bladder amyloidosis presents similarly as bladder cancer with predominant symptoms of hematuria (76%), irritative or obstructive lower urinary tract symptoms (32%), and cystitis-like symptoms (24%). The cystoscopic findings of bladder amyloidosis mimics bladder cancer, including mucosal irregularity, submucosal plaques, diffuse wall thickening, polypoid masses, yellowish tumors, and erythematous, hemorrhagic, necrotic or ulcerative lesions.
3. Transurethral resection of the lesions provides diagnostic materials and serves therapeutic purposes for bladder amyloidosis as well. Microscopic examination with special stains such as Congo red helps establish the diagnosis.
4. Amyloid light-chain amyloidosis is the most common type accounting for about 70%. It is associated with both systemic and localized amyloidosis. As such, patients need to be evaluated for presence of systemic amyloidosis before a localized form is established.

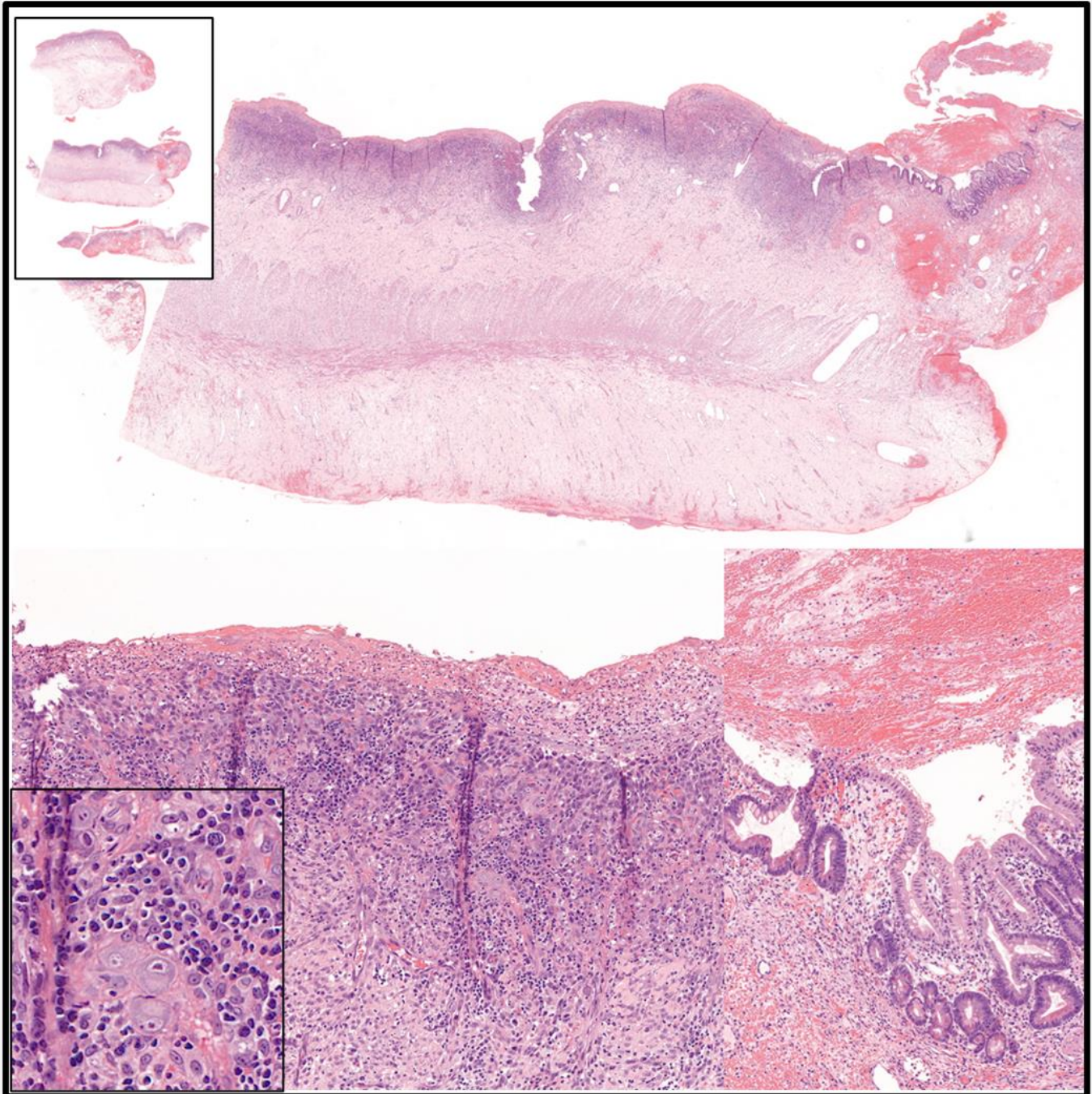
Reference

1. Pyrgidis, N., Mykoniatis, I., Pegios, V. F., Sokolakis, I., Hatzichristodoulou, G., Bourdoumis, A., ... & Sountoulides, P., 2021. Amyloidosis of the urinary bladder: a systematic review and a proposed management algorithm. *Urology*, 156, e12-e19.

Case 5

Case 5: A 34-year-old woman presented with rectal bleeding. Section from the rectum.

Targeted Diagnosis: **Cytomegalovirus proctitis.**



Submitted Diagnoses by Participating Institutions	Number	
Cytomegalovirus proctitis.	23	Acceptable
CMV colitis with chronicity features, inflammatory bowel disease cannot be excluded/possibly due to prolonged infection or underlying inflammatory bowel disease/Possible concomitant inflammatory bowel disease (IBD)	4	Acceptable
CMV proctitis in a background of ulcerative colitis, severe activity/ suggestive of IBD	3	

Educational notes:

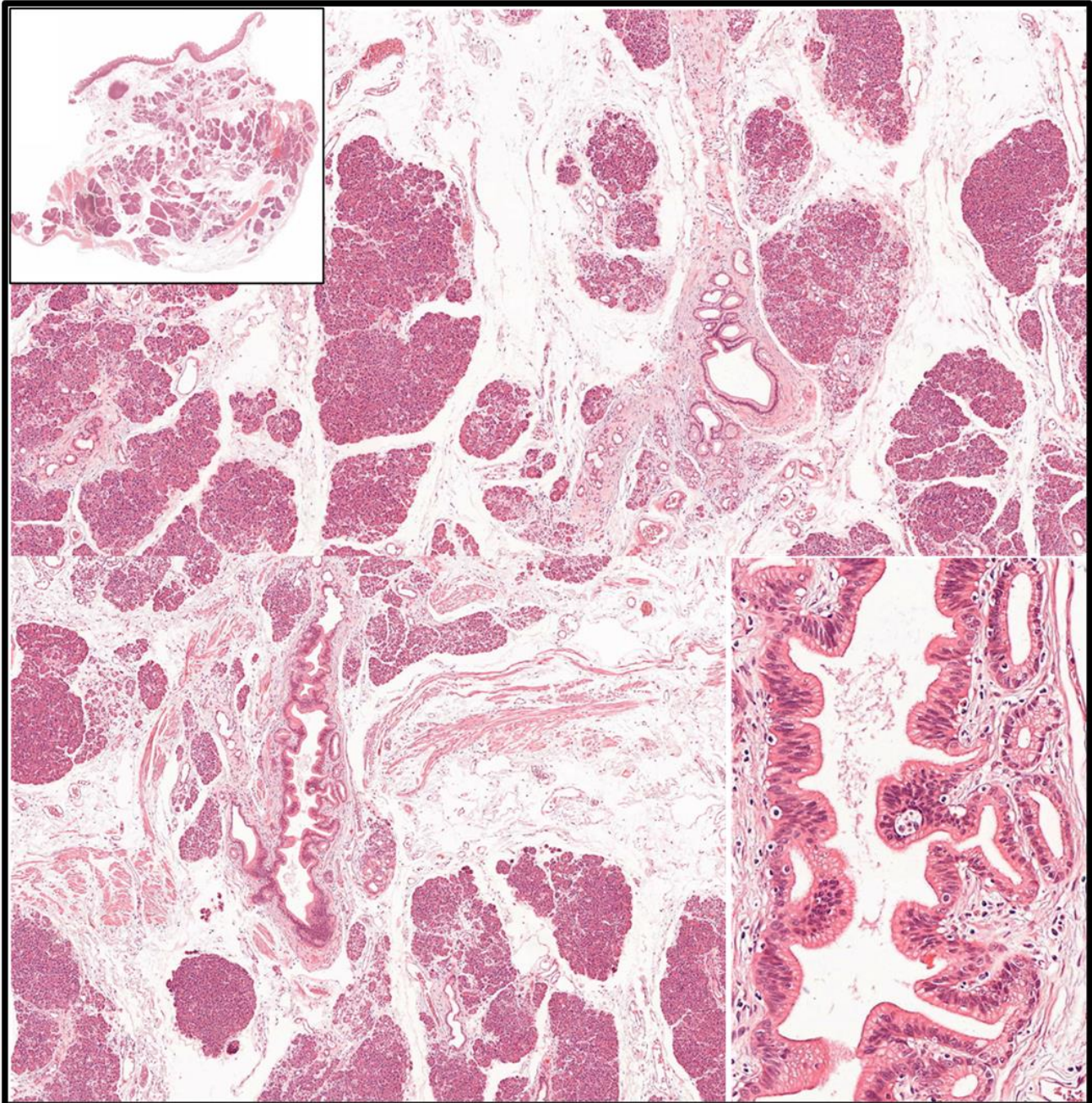
1. Sections from the rectum show extensive ulceration of the mucosa with dense mixed inflammatory infiltrates. Among the inflammatory infiltrates, there are infected enlarged histiocytoid cells displaying both nuclear and cytoplasmic inclusions characteristic of cytomegalovirus (CMV) infection. Remnant mucosa adjacent to the ulceration shows mild crypt distortion.
2. Primary CMV disease can be asymptomatic or present with infectious mononucleosis-type symptoms. After the initial infection, CMV usually enters a latency phase. Active disease may return as the result of reactivation of latent virus anywhere along the gastrointestinal tract with the predilection of the colon, causing colitis in both immunocompromised and immunocompetent hosts.
3. Confirmation of CMV relies on typical inclusions observed in H&E-stained slides, which are highly specific. Immunohistochemistry provides a higher sensitivity of 78-93%. CMV DNA real time PCR allows viral load quantification.
4. Although the relationship between existing inflammatory bowel disease, especially ulcerative colitis, and superimposed CMV infection is known, when the patients present as de novo CMV infection without existing diagnosis of IBD, cautious interpretation of histological features to suggest co-existing underlying IBD is warranted. Histological features due to CMV-induced ulceration such as crypt distortion and inflammatory cells rich in plasma cells can simulate IBD.

Reference

1. Feakins RM, ed. Non-Neoplastic Pathology of the Gastrointestinal Tract: A Practical Guide to Biopsy Diagnosis. Cambridge University Press; 2020.
2. Baniak, N. and Kanthan, R., 2016. Cytomegalovirus colitis: an uncommon mimicker of common colitides. Archives of pathology & laboratory medicine, 140(8), pp.854-858.

Case 6: A 67-year-old woman with an incidental finding of a small bowel nodule, 10cm distal to duodenojejunal junction.

Targeted Diagnosis: **Pancreatic heterotopia with low-grade pancreatic intraepithelial neoplasia (low-grade PanIN)**



Submitted Diagnoses by Participating Institutions	Number	
Pancreatic heterotopia with PanIN low grade	1	Acceptable
Pancreatic heterotopia; heterotopic pancreas; ectopic pancreas	29	Acceptable

Educational notes:

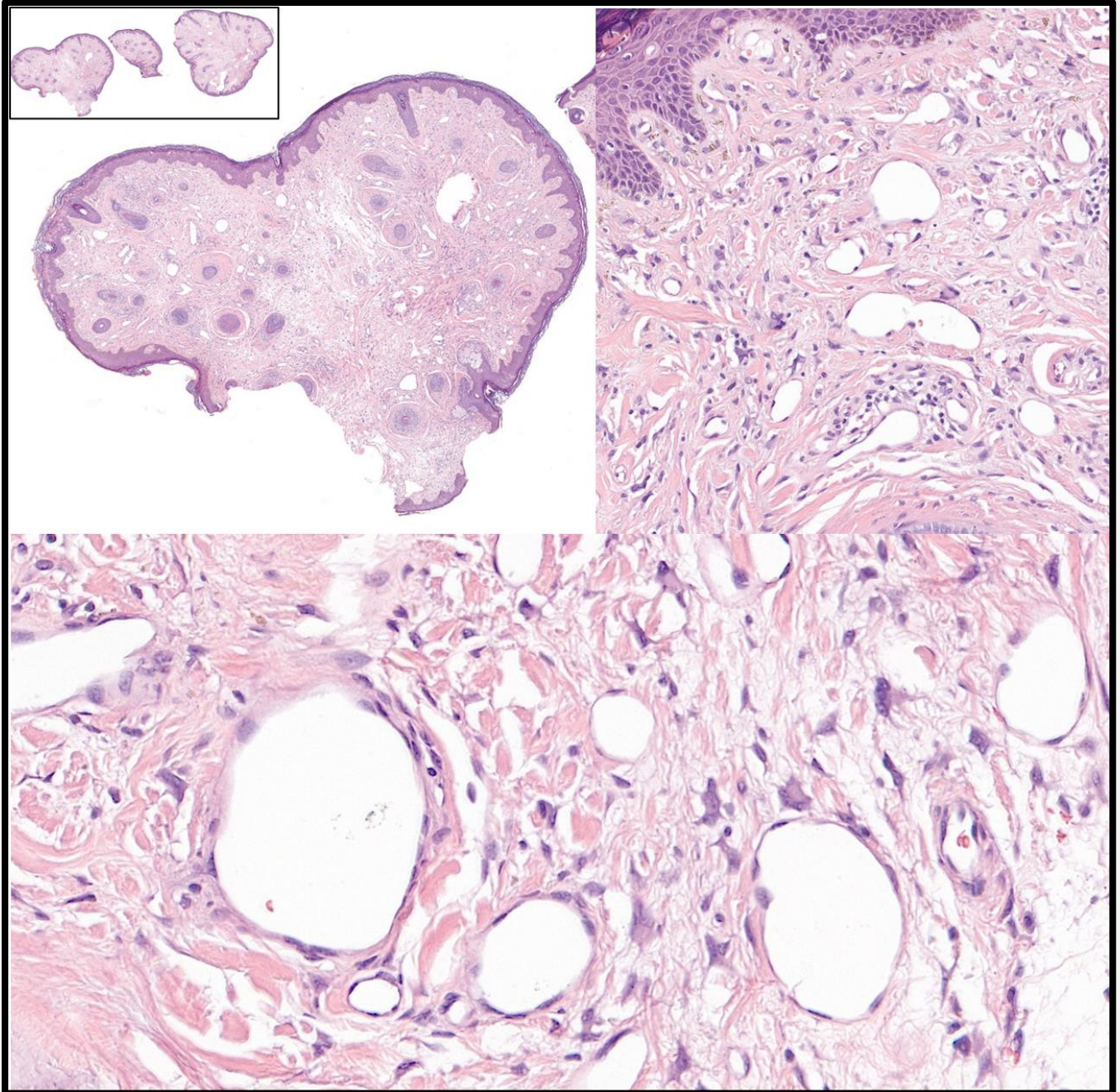
1. There is a nodular lesion within the small intestinal submucosa composed of ectopic pancreatic tissue. One of the glands exhibits low-grade dysplastic epithelium characterized by pseudostratified, basally located, pencillate and hyperchromatic nuclei with mucin depletion. The features are diagnostic of low grade pancreatic intraepithelial neoplasia (low-grade PanIN) arising within a pancreatic heterotopia.
2. Heterotopic pancreatic tissue shares similar physiological function, genetic make-up and local environment of the normal pancreas and is therefore susceptible to similar pathological conditions. Pancreatitis, cysts, low and high-grade PanIN, intraductal papillary mucinous neoplasm and adenocarcinoma have been reported.
3. Low-grade PanIN (previously PanIN-1 and PanIN-2 categories) is a common incidental finding in the normal pancreas and bears little risk of malignant transformation. They form flat or papillary lesions with low to moderate nuclear atypia and infrequent mitosis. In contrast, high-grade PanIN (previously PanIN-3) is considered carcinoma in situ. It forms papillary, cribriform or tufting pattern with luminal necrosis and severe cytological atypia.
4. Although low-grade PanIN bears no clinical significance, high-grade PanIN, when it is found in isolation, may serve as a surrogate marker for invasive carcinoma elsewhere.

Reference:

1. Ma, C., Gocke, C. D., Hruban, R. H., & Belchis, D. A., 2016. Mutational spectrum of intraepithelial neoplasia in pancreatic heterotopia. *Human pathology*, 48, 117-121.
2. Andea, A., Sarkar, F., & Adsay, V. N., 2003. Clinicopathological correlates of pancreatic intraepithelial neoplasia: a comparative analysis of 82 cases with and 152 cases without pancreatic ductal adenocarcinoma. *Modern pathology*, 16(10), 996-1006.

Case 7: A 39-year-old woman with a right nasal alae skin tag.

Targeted Diagnosis: **Fibrous papule / angiofibroma of the nose**



Submitted Diagnoses by Participating Institutions	Number	
Fibrous papule/ angiofibroma	8	Acceptable
Hair follicle naevus with differential diagnosis of angiofibroma; Benign cutaneous lesion differentials include angiofibroma/fibrous papule of nose)	2	Acceptable
Hair follicle nevus; Perifollicular fibroma differential diagnosis include hair follicle naevus	17	
Fibroepithelial polyp; Hemangioma; Pleomorphic fibroma	3	

Educational notes:

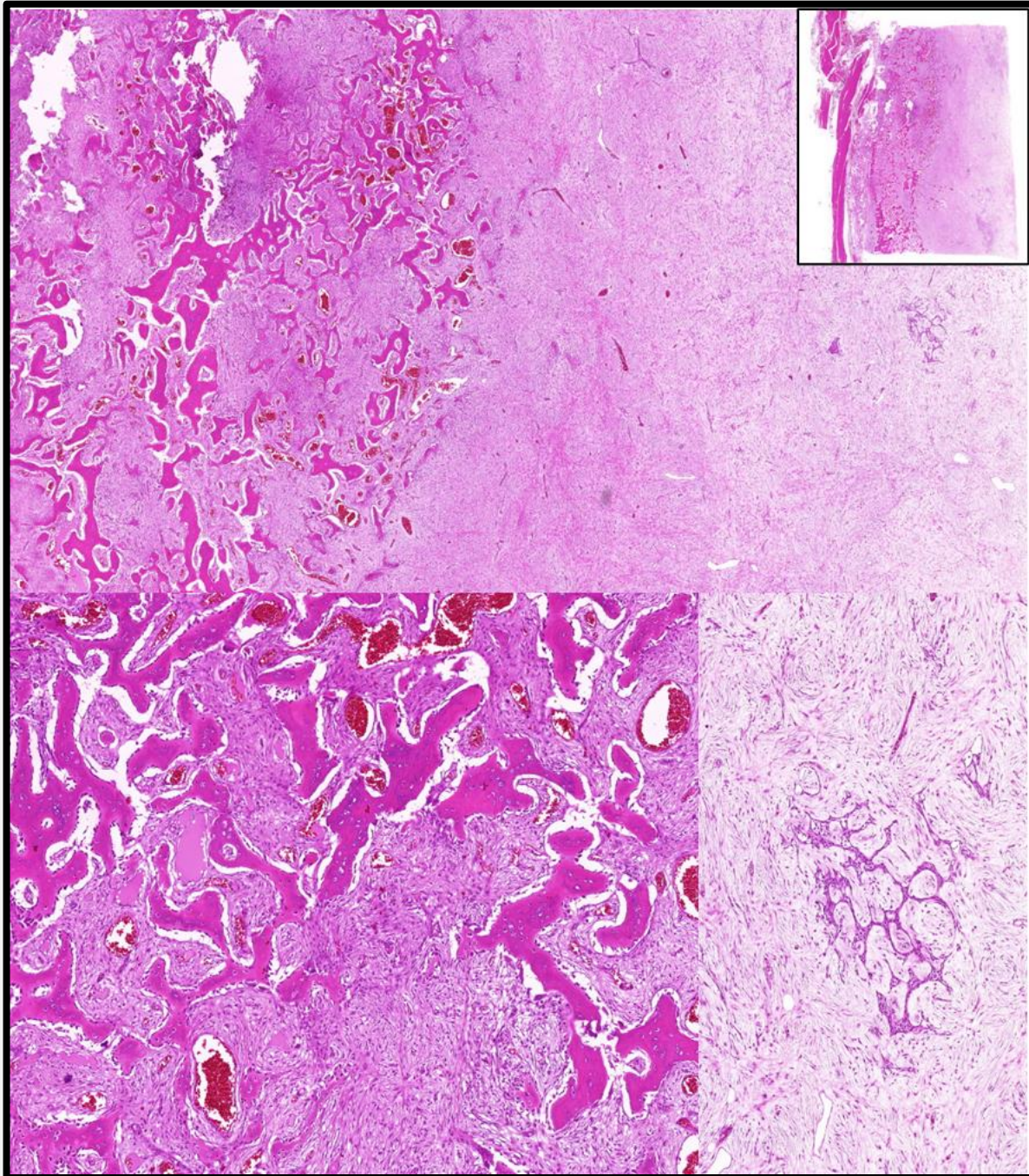
1. The polypoidal skin tissue is composed of fibrocollagenous stroma made up of plump, spindled, multinucleated and stellate cells. There is an increase in dilated thin-walled blood vessels. The vellus hair follicles are surrounded by thick collagen in an onion skin fashion. The features are diagnostic of fibrous papule (also known as angiofibroma) of the nose.
2. Fibrous papule is a benign lesion presumably of dermal fibroblastic or fibrohistiocytic origin. It is characterized by spindle to stellate fibroblasts within a dense collagenous stroma, forming a dome or polypoidal-shaped dermal lesion. Proliferation of ectatic blood vessels, concentric collagen fibers surrounding hair follicles and dermal mononuclear inflammatory cell infiltrates are described. The overlying epidermis may show hyperkeratosis, hypergranulosis, flattening of rete ridges or increased melanin pigment. Hypercellular, inflammatory, pigmented, clear-cell, and pleomorphic variants have been described.
3. Solitary fibrous papule occurring in middle-aged adults is typically sporadic. Multiple papules and those presenting in children should raise the suspicion of underlying tuberous sclerosis. Other less common associations include Birt-Hogg-Dube syndrome and Multiple Endocrine Neoplasia type 1.
4. Hair follicle nevus is a rare congenital hamartoma characterized by numerous vellus hair follicles with perifollicular fibrous thickening. They usually present at birth or early childhood. Perifollicular fibroma is another type of hamartoma showing dense concentric fibers surrounding a normal hair follicle. Proliferating ectatic thin vessels are not a feature of these conditions.

Reference

1. Chan, J. Y. L., Wang, K. H., Fang, C. L., & Chen, W. Y., 2014. Fibrous papule of the face, similar to tuberous sclerosis complex-associated angiofibroma, shows activation of the mammalian target of rapamycin pathway: evidence for a novel therapeutic strategy?. *PLoS One*, 9(2), e89467
2. Lee, J. S., Yang, J. H., Park, H., Yoon, H. S., & Cho, S., 2019. Hair follicle nevus located on the neck: comparison with accessory tragus, cervical chondrocutaneous branchial remnants and trichofolliculoma. *Annals of Dermatology*, 31(6), 662-665.
3. Nam, J. H., Min, J. H., Lee, G. Y., & Kim, W. S., 2011. A case of perifollicular fibroma. *Annals of Dermatology*, 23(2), 236.

Case 8: A 48-year-old woman presented with swelling of left lower limb. Imaging reported a lytic lesion of distal third of tibia. Gross examination showed a circumscribed, 5cm tumour with cortical destruction.

Targeted Diagnosis: **Osteofibrous dysplasia-like adamantinoma**



Submitted Diagnoses by Participating Institutions	Number	
Osteofibrous dysplasia-like adamantinoma; Adamantinoma, favours osteofibrous dysplasia-like variant.	20	Acceptable
Fibrous dysplasia-like adamantinoma	1	
Adamantinoma, Adamantinoma of long bones	9	

Educational notes:

1. The tumor is composed of predominantly osteofibrous component made up of bland spindle cells in a storiform pattern intermingled with irregular, curvilinear woven bony trabeculae rimmed by osteoblasts. Scattered tiny clusters of epithelial cells of squamous differentiation are focally observed. The epithelial cells are highlighted by CK AE1/AE3 immunohistochemistry (image not provided). There is no demonstrable mitotic activity, necrosis or marked cellular atypia. The diagnosis is osteofibrous dysplasia (OFD)-like adamantinoma.
2. Adamantinoma of the long bone is a primary biphasic fibro-osseous tumor of bone characterized by variable epithelial and osteofibrous components. Subclassification of adamantinoma is important as each subtype shows distinct clinical behavior.
3. Classic adamantinoma contains prominent epithelial components with inconspicuous fibro-osseous areas. Considered malignant, it has an almost 30% risk of metastasis and a high mortality rate. Aggressive resection with wide margins is essential as there is up to 90% risk of recurrence following incomplete surgery. In contrast, OFD-like adamantinoma is predominated by OFD-like fibro-osseous tissue, with only small clusters of epithelial cells. Considered as a 'locally aggressive tumor', this subtype has a much better outcome as compared to that of the classic form. Extensive curettage and long-term follow-up are necessary as there are rare incidences of metastasis, tumor recurrence and occasional transformation into the classic form.

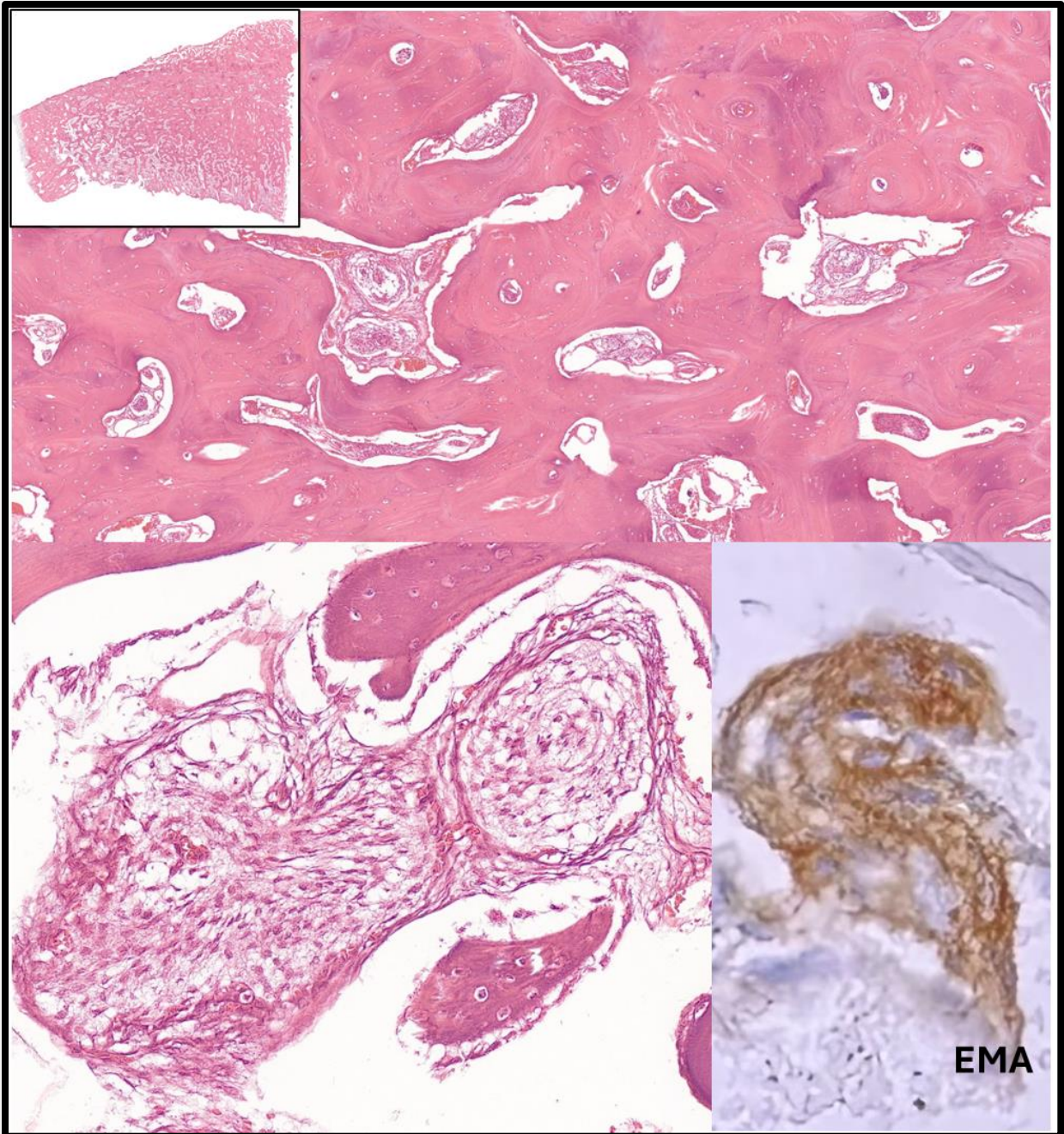
Reference

1. Petur Nielsen G., Pancras and Hogendoorn C.W. Adamantinoma of long bones. In: WHO Classification of Tumours Editorial Board. Soft tissue and bone tumours. Lyon (France): International Agency for Research on Cancer; 2020.
2. Deng, Z., Gong, L., Zhang, Q., Hao, L., Ding, Y., & Niu, X., 2020. Outcome of osteofibrous dysplasia-like versus classic adamantinoma of long bones: a single-institution experience. Journal of Orthopaedic Surgery and Research, 15, 1-9.

Case 9

Case 9: A 47-year-old woman presented with right temporal scalp swelling and right eye ptosis for 6 months. CT imaging reported hyperostosis of the bones. MRI reported an intraosseous mass with mildly thickened and enhancing dura, avid peripheral enhancement with patchy intralesional enhancement post contrast study, no intracranial extension. IHC provided: EMA. EMA is reported as positive.

Targeted Diagnosis: **Primary intraosseous meningioma, CNS WHO Grade 1**



Submitted Diagnoses by Participating Institutions	Number		
Intraosseous meningioma WHO Grade 1; Intraosseous meningiothelial meningioma WHO Grade 1; Primary intraosseous meningioma WHO CNS Grade 1.	24	Acceptable	
Meningioma WHO Grade 1; Microcystic meningioma WHO Grade 1, Meningioma; transitional subtype, WHO grade 1.	3	Acceptable	
Meningioma (No CNS WHO Grade)	1		
Invasive meningioma	1		
Chordoma	1		

Educational notes:

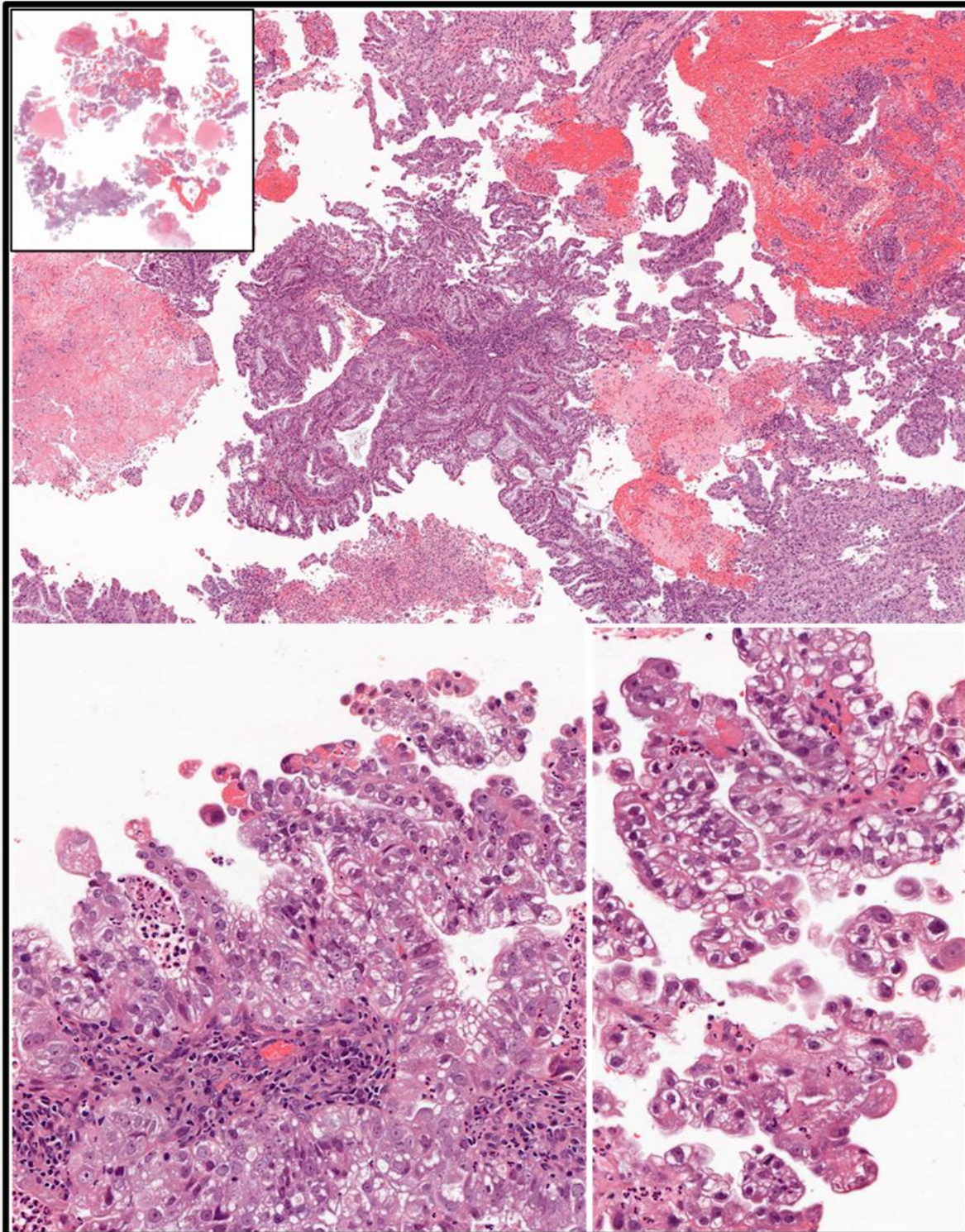
1. There is an intertrabecular proliferation of neoplastic meningothelial cells replacing the hematopoietic marrow. The lesional cells are arranged in a syncytial pattern with the formation of whorls. Mitotic activity, nuclear atypia and tumor necrosis are not seen. The tumor is positive for EMA. The diagnosis is primary intraosseous meningioma (PIM), WHO Grade 1.
2. PIM is a distinct subtype of primary extradural meningioma originating from within the cranial bone in the absence of dural origin. In contrast, bone invasive meningioma represents secondary involvement of bone when a dural originated meningioma infiltrates the overlying bone. Bone invasion does not confer a higher grade, but bone invasive meningioma is associated with worse prognosis in the setting of atypical meningioma. In addition, appropriate grading of meningioma is important as it is the most useful histopathological predictor of recurrence.
3. PIM has unique clinical, radiological, and pathological characteristics that distinguish it from both intracranial meningiomas and other skull lesions. PIM typically presents as a painless scalp mass with or without headache. Cranial nerve defects, disfigurement and epilepsy may be present depending on the site of the lesion. Computed tomography (CT) scan shows hyperostosis of the bones.
4. Chordoma is a primary malignant bone neoplasm arising within the axial skeleton, particularly in the skull base and the sacrococcygeal region. Histologically, it differs from meningioma as it is composed of cords or ribbons of physaliphorous cells displaying clear to eosinophilic cytoplasm with distinctive vacuolated or bubbly appearance. The lesional cells are set in a myxoid matrix in conventional chordoma or hyaline cartilage-like extracellular matrix in chordoid chordoma.

Reference

1. Elwatidy, S., Alanazi, A., Alanazi, R. F., & Alraddadi, K. K., 2022. Intraosseous meningioma, a rare presentation of a common brain tumor: illustrative case. *Journal of Neurosurgery: Case Lessons*, 4(15).
2. Clynch, A. L., Norrington, M., Mustafa, M. A., Richardson, G. E., Doherty, J. A., Humphries, T. J., ... & Brodbelt, A. R., 2023. Cranial meningioma with bone involvement: surgical strategies and clinical considerations. *Acta neurochirurgica*, 165(5), 1355-1363.

Case 10: A 50-year-old woman presented with abnormal menstrual bleed. Endometrial biopsy.

Targeted Diagnosis: Clear cell carcinoma



Submitted Diagnoses by Participating Institutions	Number	
Clear cell carcinoma	19	Acceptable
Endometrial carcinoma favors clear cell carcinoma; High grade carcinoma favor/differential includes clear cell carcinoma; Adenocarcinoma with clear cell features, differential includes clear cell carcinoma; Endometrioid carcinoma (Grade 2) with secretory pattern, rule out clear cell carcinoma with immunohistochemistry	9	Acceptable
Endometrioid endometrial carcinoma with clear cell changes	1	
Endometrioid adenocarcinoma, secretory variant, FIGO grade 1.	1	

Educational notes:

1. There are multiple tumor fragments with tumor cells forming tubulocystic and short papillary structures. The tumor cells are cuboidal and polygonal displaying abundant clear to eosinophilic cytoplasm and large nuclei and prominent nucleoli. Hobnail cells are present. The features are diagnostic of clear cell carcinoma (CCC) of the uterine corpus.
2. CCC of the uterus is a type II, estrogen-independent endometrial cancer. Compared with endometrioid carcinoma, CCC shows a more aggressive clinical behavior with older patient age, higher stage at presentation, deep myometrial invasion, propensity for extrauterine spread and disease relapse beyond the pelvis.
3. Mere presence of clear cells is not diagnostic of CCC. CCC is characterized by an admixture of typical major architectural patterns (tubulocystic, papillary, and solid). The composing tumor cells range from cuboidal to low columnar, to polyhedral to flattened configuration with high-nuclear grade.
4. In contrast, the major contender, endometrioid carcinoma with secretory pattern in the uterus, is characterized by the presence of supra and/or subnuclear glycogen vacuoles. The tumor cells are exclusively composed of a uniform population of columnar cells with less striking nuclear atypia. Cytoplasmic clearing in endometrioid carcinoma can also be due to glycogen-rich squamous differentiation. In this case, the cells are either polygonal or rounded, and conventional areas of squamous differentiation are typically present within the vicinity.

Reference

1. Abdulfatah, E., Sakr, S., Thomas, S., Al-Wahab, Z., Mutch, D. G., Dowdy, S., ... & Ali-Fehmi, R., 2017. Clear cell carcinoma of the endometrium: evaluation of prognostic parameters in a multi-institutional cohort of 165 cases. *International Journal of Gynecologic Cancer*, 27(8).
2. Malpica, A., 2016 How to approach the many faces of endometrioid carcinoma. *Modern Pathology*, 29, S29-S44.

