International Academy of Pathology
Malaysian Division

FINAL REPORT

QUALITY ASSURANCE PROGRAM
GENERAL DIAGNOSTIC HISTOPATHOLOGY
CYCLE 02/2019

NOTES FROM THE COORDINATOR

1. For this cycle 02/2019, a total of 23 institutions responded online by the closing date of 15 November 2019.

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 02/2019 could be directed to Dr. Ch'ng Ewe Seng, e-mail: iapmdqap@gmail.com.

4. The coordinator would like to acknowledge the contributions from Prof. Dr. Nor Hayati Othman, Dato Dr. Norain Karim, Dr. Hakimah Mahsin, Datin Dr. Nik Raihan Nik Mustapha, Dr. Yusri Yusuf, Dr. Fazilah Hassan, and Dr. Suhaila Abdullah.

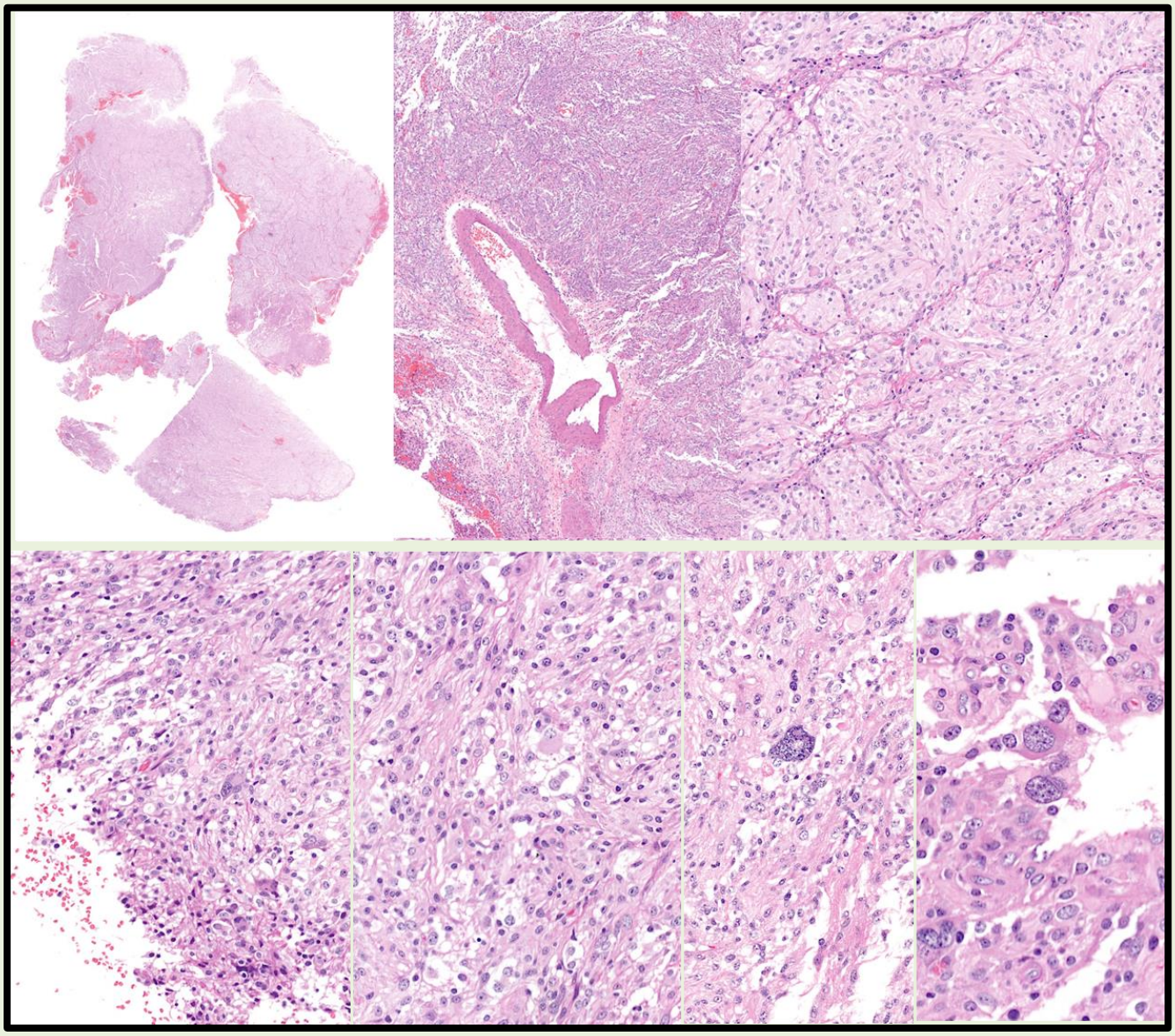
Prepared by,

Ch'ng Ewe Seng, MD, MPath, FIAC
Coordinator for IAP-MD QAP

Case 11

Case 11: 16-year-old male. Left temporal-parietal solid enhancing nodule. One representative section.

Targeted Diagnosis: **Pleomorphic xanthoastrocytoma (WHO grade II)**



Case 11

Submitted Diagnoses by Participating Institutions	Number	
Pleomorphic xanthoastrocytoma, WHO grade II	18	Acceptable
Pleomorphic xanthoastrocytoma Immunostains required are CD117, Oct3/4, SALL4 and GFAP to rule out Germinoma as a differential diagnosis/Pleomorphic Xanthoastrocytoma. However, since increase mitosis is present (2 in 10 high power field), possibility of Anaplastic Astrocytoma and Glioblastoma Multiforme need to be excluded. Suggest for GFAP, Reticulin stain and Ki-67	2	Acceptable
Differential diagnosis: Paraganglioma vs atypical meningioma. To perform IHC (Paraganglioma- chromo, synapto, S100 sustantecular cells and meningioma-EMA)	1	
Ganglioglioma, WHO grade I	1	
Germinoma	1	

Educational notes:

1. There are three fragments of tumor tissue; one of them incorporates a muscularized artery into the tumor. The tumor cells show abundant pale eosinophilic fibrillary cytoplasm. They have a great variation of the nuclear size. Some nuclei contain prominent nucleoli. A few bizarre multinucleated giant cells are observed. There is strikingly lack of mitosis despite nuclear pleomorphism. Eosinophilic granular bodies and perivascular lymphocytic clusters are noted. No necrosis or microvascular proliferation is seen. These features are those of pleomorphic xanthoastrocytoma.
2. Pleomorphic xanthoastrocytoma, WHO grade II, occurs in children and young adults. Many of the patients present with a long history of seizures. The tumor is solid or solid cystic with strong postcontrast enhancement on CT scan.
3. Pleomorphic xanthoastrocytoma is a superficial tumor as indicated by the presence of muscularized arteries of the leptomeninges incorporated into the tumor. Presence of large bizarre or multinucleated neoplastic astrocytes in the reticulin rich stroma (by reticulin stain) characterizes this non-diffuse astrocytoma variant. The mitotic count is low (<5/10HPF) despite nuclear pleomorphism. Immunohistochemically, they are positive for GFAP. Presence of BRAF V600E mutation by immunohistochemistry in the absence of IDH mutation differentiates pleomorphic xanthoastrocytoma from diffuse astrocytoma.

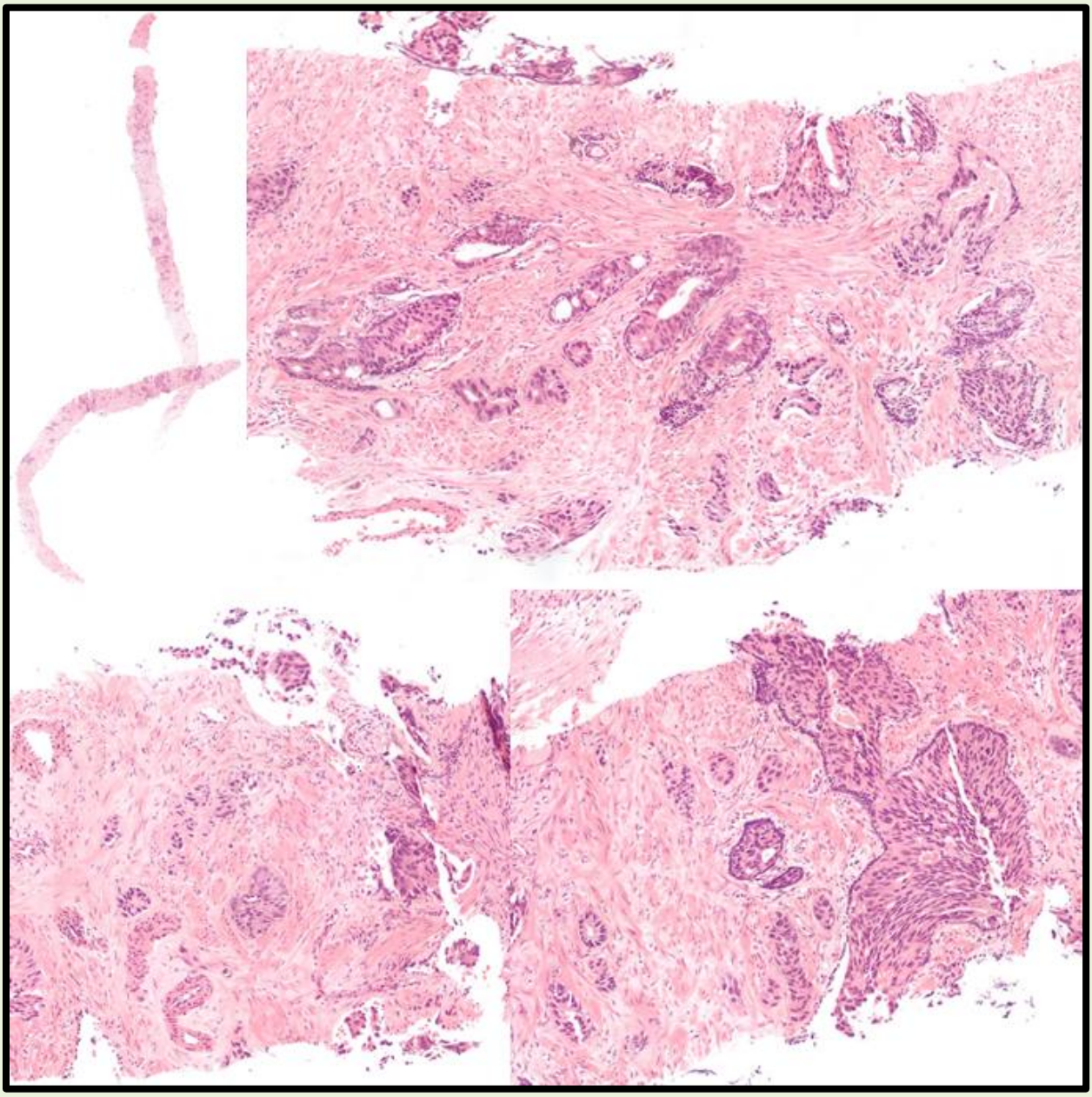
Reference:

1. WHO Classification of Tumours of the Central Nervous System, 4th Edition, revised, 2016

Case 12

Case 12: 70-year-old male. PSA 30.39. Prostate biopsy. One representative section.

Targeted Diagnosis: **Prostatic acinar adenocarcinoma, Gleason score 3 +4, group grade 2 and intraductal carcinoma**



Case 12

Submitted Diagnoses by Participating Institutions	Number	
Prostatic acinar adenocarcinoma, Gleason score 3+4 =7, group grade 2 and intraductal carcinoma	8	Acceptable
Prostatic adenocarcinoma, Gleason score 3+4 =7, Grade group 2	2	Acceptable
Prostatic Adenocarcinoma, Acinar type (Gleason score 4+3)	2	Acceptable
Prostatic adenocarcinoma (Gleason pattern 3 + 4) and high grade PIN/ Invasive prostatic adenocarcinoma (Gleason score 4+4=8) and high-grade PIN	2	Acceptable
Adenocarcinoma (Gleason 3+3) with foci of intraductal carcinoma/ Prostatic adenocarcinoma, Gleason 6 (3+3) with high-grade prostatic intraepithelial neoplasia (PIN)	2	Acceptable
Acinar adenocarcinoma, Gleason score 9 (4+5), grade group 5 with intraductal carcinoma/ Adenocarcinoma, Gleason score 9 (4+5), Grade group 5.	2	
Adenocarcinoma with intraductal carcinoma	2	
Ductal adenocarcinoma, 4+5/ Ductal carcinoma	2	
Adenocarcinoma	1	

Educational notes:

1. There are two strips of prostatic tissue almost completely involved by prostatic acinar adenocarcinoma composed of predominantly scattered infiltrating small glands (pattern 3) and a few poorly formed glands and cribriform glands (pattern 4). In addition, there is a component of intraductal carcinoma of the prostate with dense cribriform glands retaining basal cell layer at the periphery.
2. There are large cribriform proliferations with cytological atypia in this biopsy. The differential diagnoses include high grade prostatic intraepithelial neoplasia (HGPIN), intraductal carcinoma (IDC-P) and invasive cribriform acinar carcinoma (pattern 4). Presence of the basal cell layer excludes invasive cribriform acinar carcinoma. Dense cribriform pattern (atypical cells spanning 50%–70% of the lumina of the glands) distinguishes IDC-P from HGPIN. Other distinguishing features are marked nuclear pleomorphism (>6 times normal) and nonfocal comedonecrosis.
3. In the presence of Gleason pattern 4 prostatic acinar adenocarcinoma in this biopsy, immunohistochemistry to ascertain IDC-P is not required as the overall Gleason is not affected. If the overall Gleason score is 6 or only IDC-P is suspected, immunohistochemistry is required to exclude cribriform carcinoma as IDC-P is not factored into the Gleason score. A comment that IDC-P is often associated with high-grade invasive cancer is recommended.

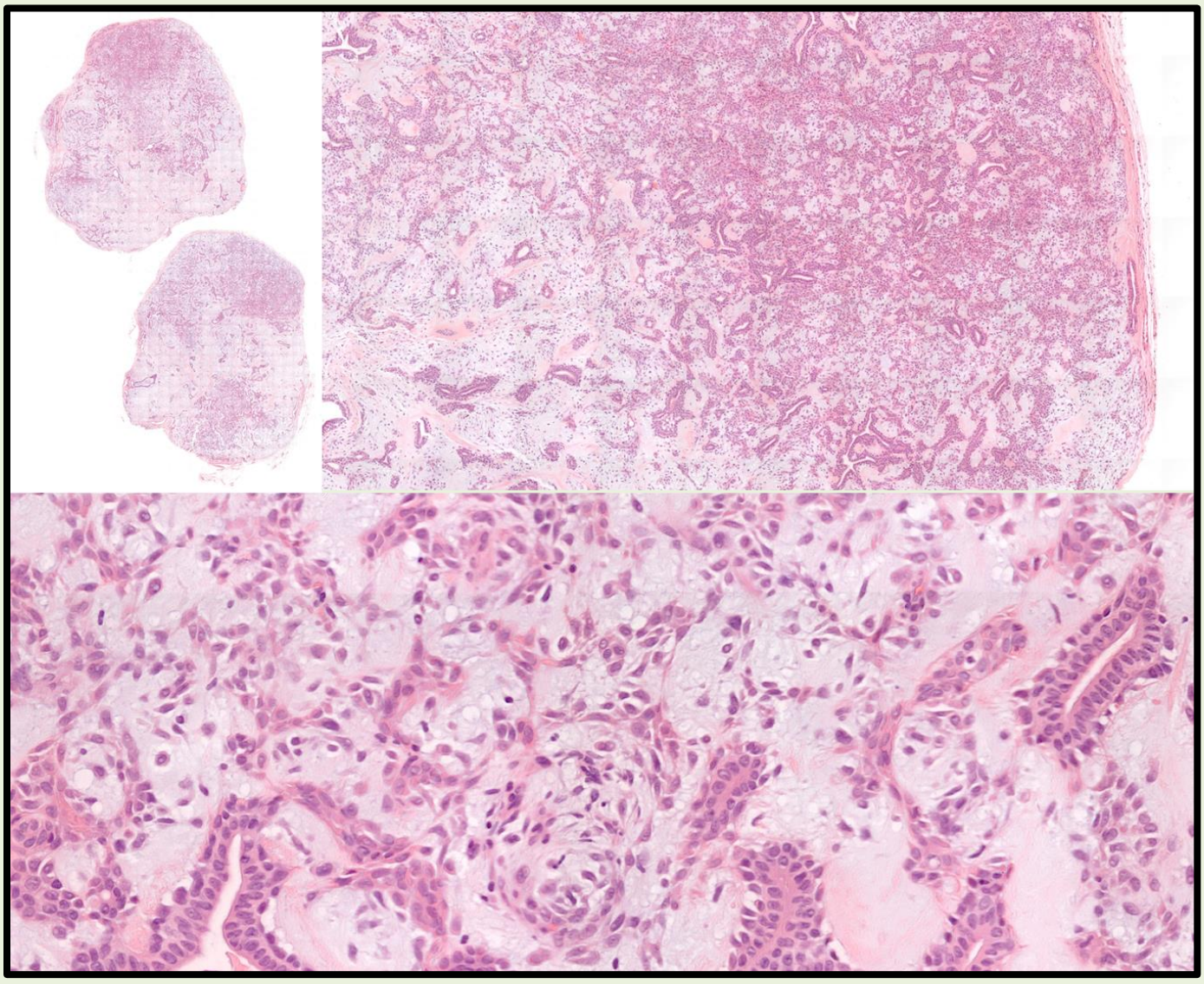
Reference

1. Moch, H., Humphrey, P.A., Ulbright, T.M. and Reuter, V.E., 2016. WHO Classification of Tumours of the Urinary System and Male Genital Organs. 2016.

Case 13

Case 13: 40-year-old female. Left breast lump. One representative section.

Targeted Diagnosis: **Pleomorphic adenoma of the breast**



Case 13

Submitted Diagnoses by Participating Institutions	Number	
Pleomorphic adenoma/ Benign mixed tumour/ Chondroid syringoma	21	Acceptable
Adenomyoepithelioma	1	
Benign Breast Lesion. Differential could be Breast Hamartoma, Complex Fibroadenoma etc	1	

Educational notes:

1. This breast lump is well circumscribed. There are scattered glands composed of epithelial cells and myoepithelial cells. The myoepithelial cells appear melting into the surrounding chrondomyxoid stroma. These features are characteristics of pleomorphic adenoma of the breast.
2. Mammary glands and salivary glands are exocrine glands that can develop tumors with similar morphological features. Salivary gland-type tumors develop in the breast can be associated with myoepithelial differentiation or without myoepithelial cell differentiation. The benign prototypic salivary gland-type tumor in the breast is pleomorphic adenoma, displaying characteristic chrondromyxoid stroma with scattered bi-layered glands and dispersed myoepithelial cells. Similarly, the cutaneous part is chondroid syringoma of the sweat gland.
3. The malignant salivary gland-type tumors in the breast without myoepithelial differentiation include acinic cell carcinoma and mucoepidermoid carcinoma; adenoid cystic carcinoma displays myoepithelial differentiation.

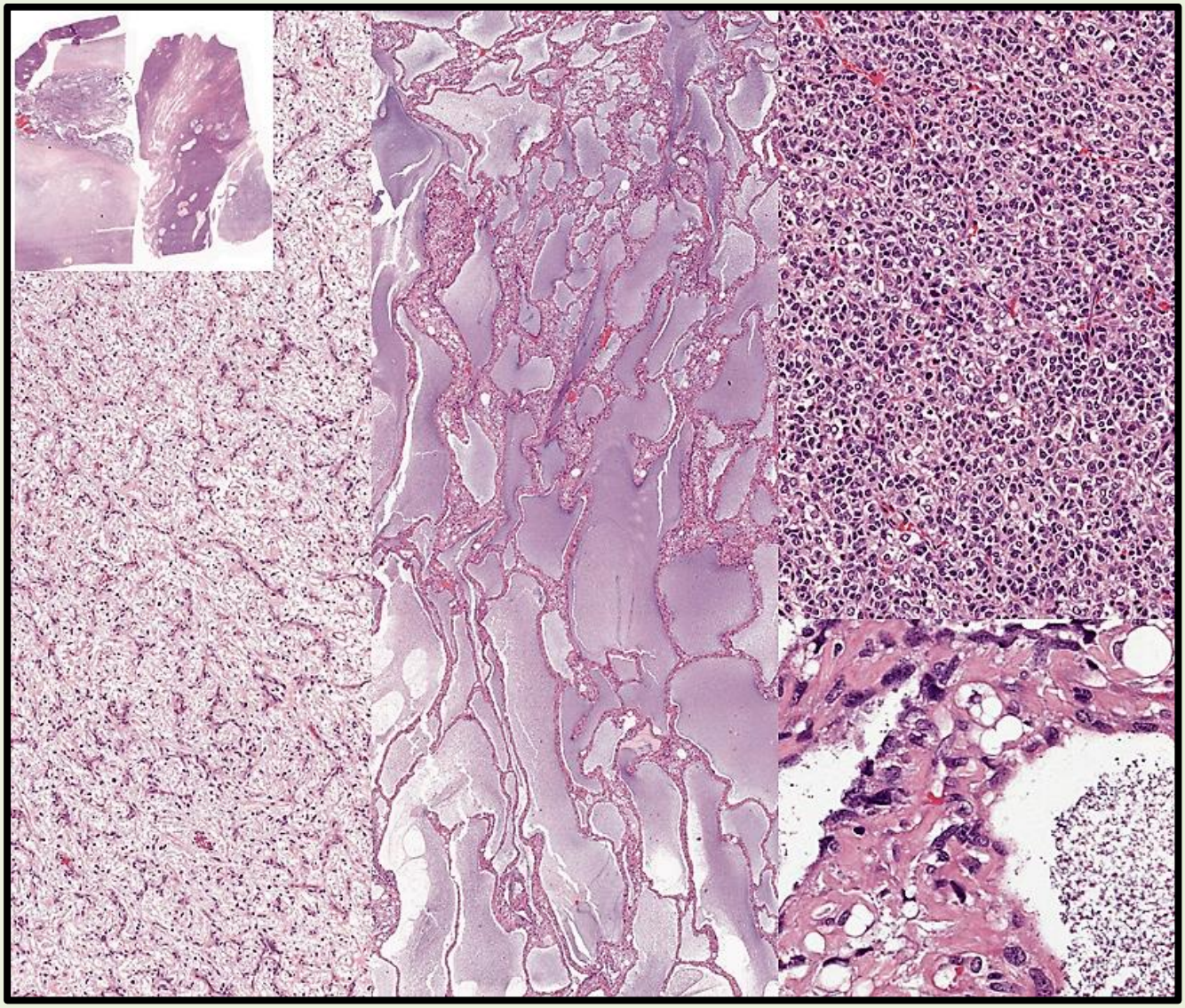
Reference

1. Lakhani, Sunil R., ed. WHO Classification of Tumours of the Breast. International Agency for Research on Cancer, 2012..

Case 14

Case 14: 35-year-old male. A 10cm-calf swelling. One representative section.

Targeted Diagnosis: **myxoid liposarcoma, high grade**



Case 14

Submitted Diagnoses by Participating Institutions	Number	
Myxoid liposarcoma/ Myxoid liposarcoma, high grade/ High grade myxoid liposarcoma (with round cell component)/ Round cell/myxoid liposarcoma	20	Acceptable
Dedifferentiated liposarcoma, low grade	1	
Myxofibrosarcoma intermediate grade	1	
Lymphangioma	1	

Educational notes:

1. This tumor shows a variety of appearances: the characteristic chicken-wire capillary network in the myxoid background, prominent "pulmonary edema" growth pattern or microcystic lymphangioma-like pattern, and solid hypercellular pattern. This tumor is composed of rather uniform round, oval shaped to spindle shaped cells. The solid hypercellular area shows compact round cells. Uni-vacuolated, bi-vacuolated and multi-vacuolated lipoblasts are evident. These features are that of high grade myxoid liposarcoma.
2. Myxoid liposarcoma occurs commonly at the lower limbs of young to middle aged adults. They have a variety of growth patterns; the defining feature is the chicken-wire capillary network with bona fide lipoblasts in the myxoid background. Presence of hypercellular area more than 5% with round cell differentiation signifies high grade myxoid liposarcoma. Previously classified myxoid liposarcoma and round cell liposarcoma are now considered as the spectrum of the same entity supported by the common genetic translocations resulting in FUS-DDIT3(CHOP) and EWSR1-DDIT3(CHOP) gene fusions.
3. A number of myxoid sarcomas such as myxofibrosarcoma and extraskeletal myxoid chondrosarcoma contain pseudolipoblasts mimicking myxoid liposarcoma. These myxoid sarcomas however lack the characteristic chicken-wire capillary network.

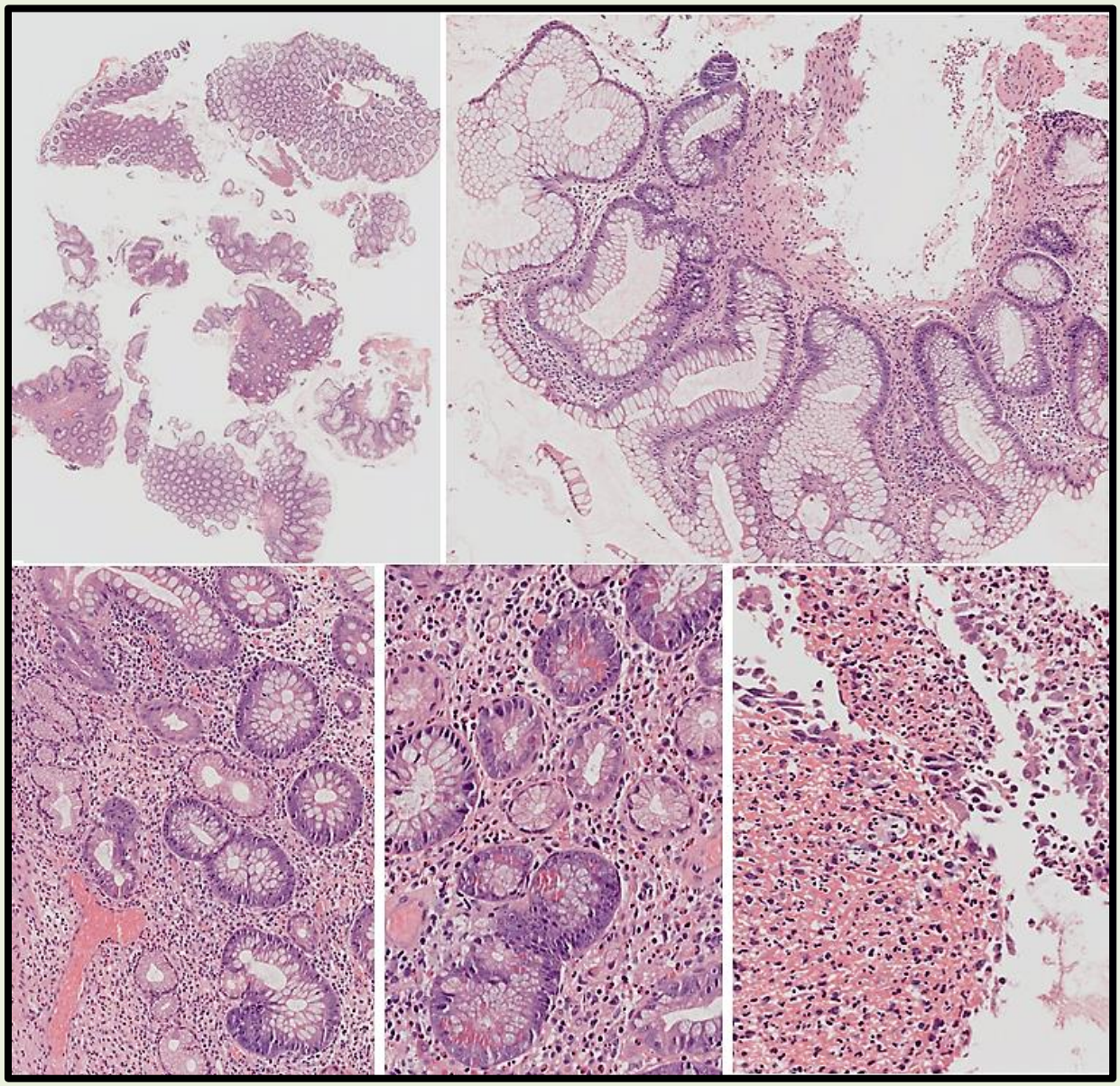
Reference

1. Creytens, D., 2019, February. A contemporary review of myxoid adipocytic tumors. In Seminars in diagnostic pathology.

Case 15

Case 15: 26-year-old male. Anaemic, diarrhoea for 1 month. Colonoscopy: superficial ulcers, discontinuous inflammation throughout colon. Colonic biopsies. One representative section.

Targeted Diagnosis: **Chronic colitis with moderate activity, consistent with Crohn disease**



Case 15

Submitted Diagnoses by Participating Institutions	Number	
Inflammatory bowel disease, possible Crohn's disease/ Inflammatory bowel disease consistent with Crohn's disease/ Patchy colitis with moderate mucosal activity and modest feature of chronicity and microgranuloma, consistent with Crohn Disease	4	Acceptable
Amoebic colitis with morphologic features suggestive of inflammatory bowel disease (Crohn disease)/ Chronic active colitis coexisting with amoebiasis	2	
Chronic active colitis	1	
Amoebic colitis/ Amoebic colitis Comment: Special stain PAS is required to confirm Entamoeba Histolytica organism.	15	
CMV colitis	1	

Educational notes:

1. The colonic biopsies show relatively preserved crypt architecture in some fragments and distorted crypts in a few fragments characterized by crypt dilation and mild branching. In a fragment, pyloric gland metaplasia is noted. Another fragment shows Paneth cell metaplasia. The lamina propria shows moderate neutrophilic infiltrates with focal cryptitis. Sloughing of the musoca with neutrophilic infiltrates mixed with fibrinoid debris is seen. No microorganism is noted. These features are that of patchy chronic colitis with moderate activity.
2. The colonic biopsies show chronic colitis pattern, i.e. crypt abnormalities in a few fragments, presence of pyloric gland metaplasia (always abnormal in colon) and Paneth cell metaplasia (abnormal if located at the left colon). In addition, there is concomitant active component composed of lamina propria neutrophils, focal cryptitis and erosion. The chronic changes however affect only a few fragments as some fragments have preserved crypt architecture. This patchy chronic colitis with moderate activity correlates with the endoscopic findings of discontinuous inflammation in the colon with superficial ulcers. These clinico-pathologic findings are consistent with Crohn disease over ulcerative colitis.
3. Histiocytes with phagocytized debris in fibrinoid debris may mimics the trophozoites of Entamoeba histolytica. PAS staining can help in making the distinction.
4. Distinguishing IBD from acute infectious colitis/ non-IBD colitis depends on a number of features. Features of chronicity of IBD such as basal plasmacytosis, crypt abnormalities, crypt atrophy and irregular/villous mucosa surface are highly reliable. On the other hands, infective colitis is distinguished from IBD based on the absence of features of IBD rather than the positive findings of infection.

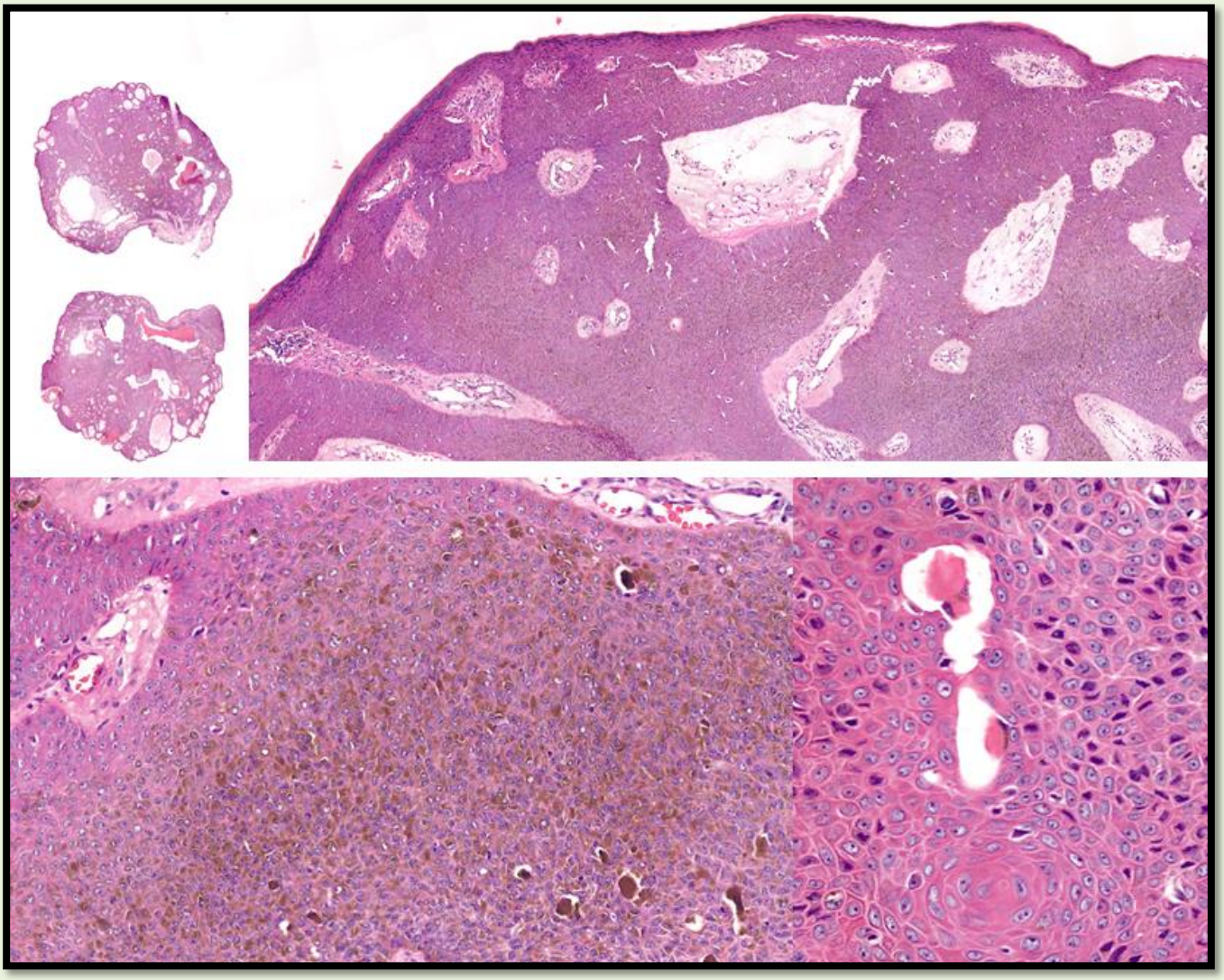
Reference

1. Feakins, Roger M. "Inflammatory bowel disease biopsies: updated British Society of Gastroenterology reporting guidelines." Journal of clinical pathology 66, no. 12 (2013): 1005-1026.

Case 16

Case 16: 52-year-old female. Cheek lesion for 5 years. One representative section.

Targeted Diagnosis: **Poroma**



Case 16

Submitted Diagnoses by Participating Institutions	Number	
Eccrine poroma/ Benign adnexal tumour, consistent with poroma/ Pigmented eccrine poroma/ Benign tumour. suggestive of apocrine poroma	20	Acceptable
Hidradenoma	1	Acceptable
Benign adnexal tumour. Differentials include poroma and hidradenoma	1	Acceptable
Basal cell carcinoma	1	

Educational notes:

1. This pigmented skin tumor is composed of poroid cells and cuticular cells extending from the epidermis into the dermis in sheets. The poroid cells have scanty cytoplasm in contrast to the cuticular cells that have abundant eosinophilic cytoplasm forming rare true ducts. Melanin pigments are abundant. The stroma in between is markedly edematous in foci with cystic change. These histological features are that of poroma.
2. This skin adnexal tumor appears as solid tumor with squamoid (poroid) cells. Higher power reveals cuticular cells with rare true ducts. This histological pattern points towards acrospiromas, so named after their differentiation towards acrosyringium. Depending on their locations, they are named as hidroacanthoma simplex (completely intradermal), poroma (involving both epidermis and dermis), dermal duct tumor (superficial dermis with multiple nodules) and hidradenoma (deep dermis with large nodules often associated with cystic change).

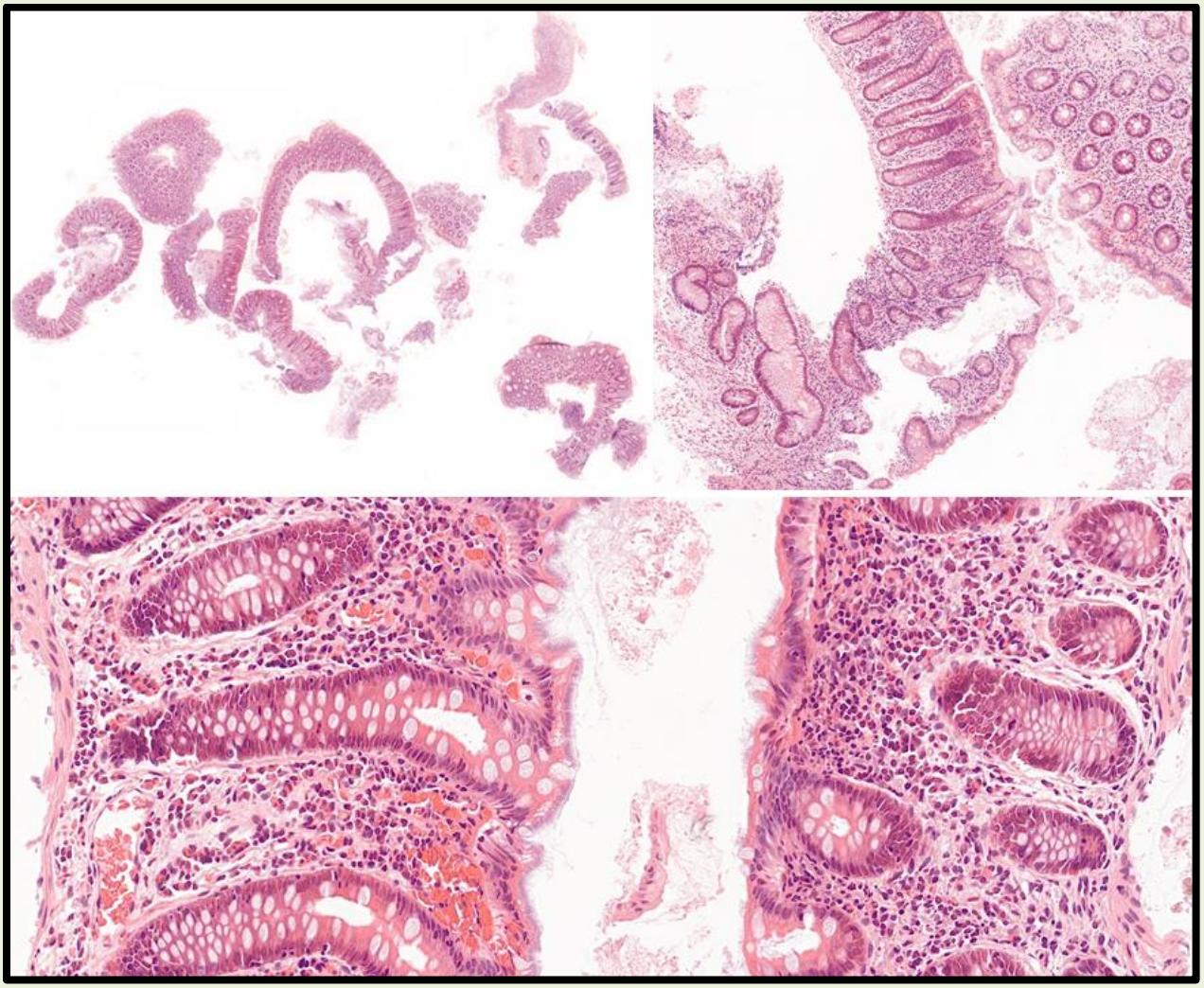
Reference:

1. Fulton, E. H., J. R. Kaley, and J. M. Gardner. "Skin Adnexal Tumors in Plain Language: A Practical Approach for the General Surgical Pathologist." Archives of pathology & laboratory medicine 143, no. 7 (2019): 832.

Case 17

Case 17: 66-year-old male. Underlying inflammatory bowel disease on follow up. One representative section.

Targeted Diagnosis: **Chronic colitis with moderate activity in keeping with inflammatory bowel disease and intestinal spirochetosis**



Case 17

Submitted Diagnoses by Participating Institutions	Number	
Spirochetosis with chronic active colitis/ Inflammatory bowel disease with moderate to marked activity and Intestinal Spirochetosis/ Consistent with chronic inflammatory bowel disease with concomitant colonic spirochetosis/ Acute on chronic colitis with Spirochetosis	5	Acceptable
Intestinal spirochetosis/ Intestinal spirochetosis (infectious colitis) Special stain required are Giemsa or Warthin Starry Silver stain/ Intestinal spirochetes with focal mucosal ulceration	13	
Intestinal spirochetosis. No activity or chronicity seen.	1	
Intestinal spirochetosis with possible crypt dysplasia/ Spirochetosis with possible suspicious invasive carcinoma. However, I would like to request for deeper section or repeat biopsy or IHC stain	2	
Drug induced colitis	1	
Mild active colitis with chronic changes	1	

Educational notes:

1. Section shows multiple fragments of colonic mucosa. Most fragments show orderly arranged colonic crypts. One fragment shows erosion and moderate neutrophilic infiltrates in the lamina propria with crypt drop-out. Another fragment shows mildly distorted crypts. This patchy chronic colitis with moderate activity is in keeping with the history of inflammatory bowel disease. In addition, the surface epithelium shows basophilic, fuzzy filamentous attachment characteristic of intestinal spirochetosis.
2. The histological features of chronicity in this follow-up biopsy support the previously established diagnosis of inflammatory bowel disease. Presence of moderate activity in this biopsy however indicates incomplete remission if therapy has been administered. Assessment of activity in surveillance biopsy may help stratify patients into risk categories for cancer screening and to determine completeness of remission following treatment.
3. Intestinal spirochetosis is associated with diverticular disease, inflammatory bowel disease, hyperplastic polyps and adenomatous polyps. Spirochetes attach on the surface epithelium without invasion. They are usually not associated with inflammatory infiltrates. They are recognized in H&E stained slides and stained heavily by Warthin-Starry stain.
4. Although spirochetes are found in patients with presenting symptoms of diarrhea, anal pain or discharge, their clinical significance remains controversial; many patients with intestinal spirochetosis are asymptomatic whereas symptomatic immunocompromised patients have other concomitant infections.

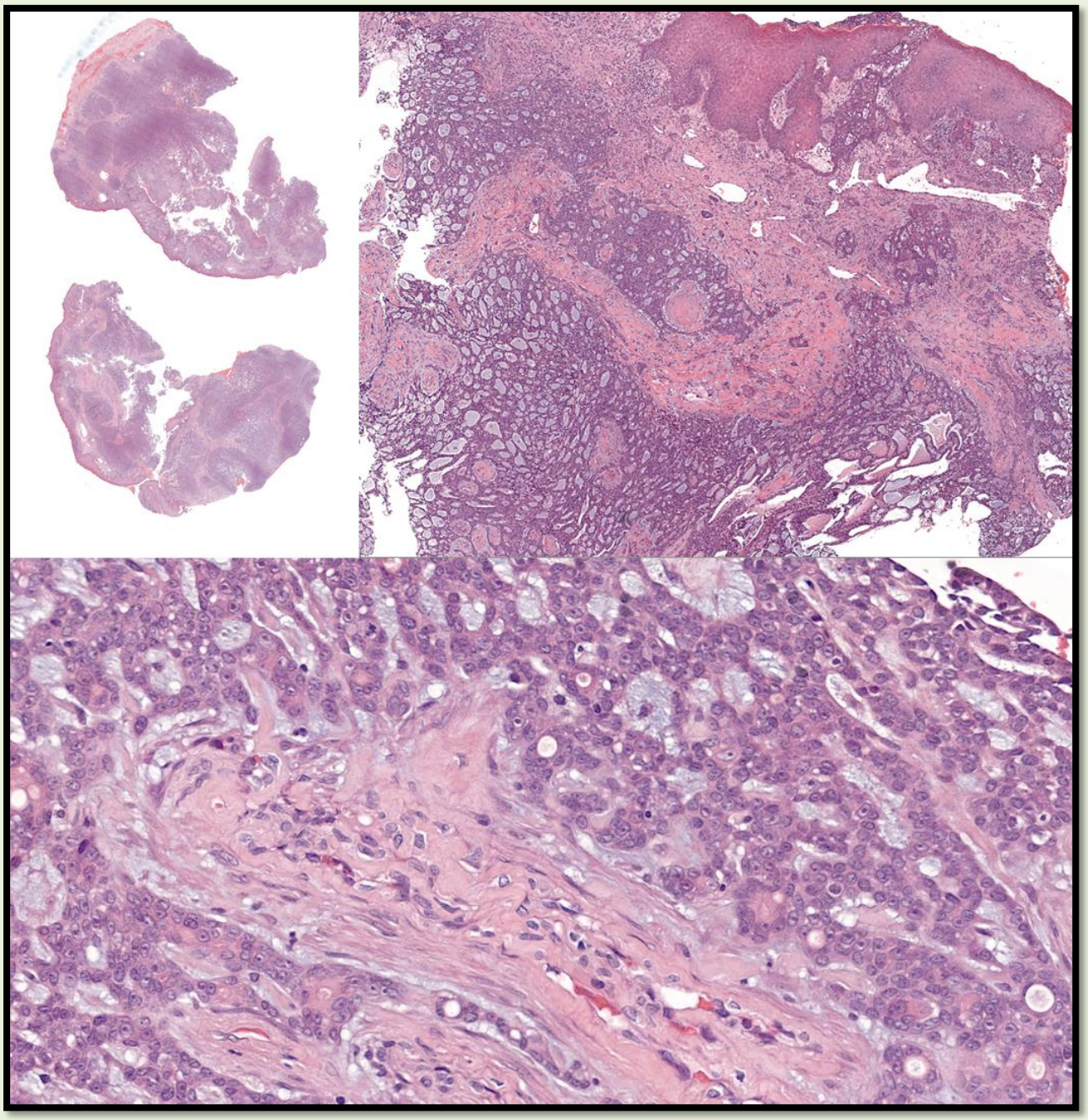
Reference

1. Feakins, Roger M. "Inflammatory bowel disease biopsies: updated British Society of Gastroenterology reporting guidelines." Journal of clinical pathology 66, no. 12 (2013): 1005-1026.
2. Odze, R. D., & Goldblum, J. R. (2014). Surgical pathology of the GI tract, liver, biliary tract, and pancreas. Elsevier Health Sciences.

Case 18

Case 18: 61-year-old male. Upper lip swelling. One representative section.

Targeted Diagnosis: **Adenoid-cystic carcinoma**



Case 18

Submitted Diagnoses by Participating Institutions	Number	
Adenoid-cystic carcinoma	17	Acceptable
Malignant salivary gland tumour differentials include Polymorphus low grade adenocarcinoma and adenoid cystic carcinoma/ Adenoid cystic carcinoma. Differential include polymorphous adenocarcinoma. Suggest to do mammoglobin and CD117/ Malignant salivary gland tumour, diff diagnosis polymorphous adenocarcinoma vs mucoepidermoid carcinoma	4	Acceptable
Adenoid basal cell carcinoma. Comment: Must exclude adenoid cystic carcinoma (ACC). IHC to confirm diagnosis and exclude ACC : BCL 2, CK7, S100, CD117, EMA and CEA	1	Acceptable
Basal cell carcinoma, nodular variant	1	

Educational notes:

1. Section shows an infiltrative carcinoma in the lamina propria. This carcinoma shows predominantly cribriform pattern with pseudolumina filled by basophilic myxoid substance and rare true lumina. Solid areas are noted. Dispersed tubular pattern is minimal. This carcinoma has focally invaded the overlying stratified squamous epithelium with reticular pattern. No obvious perineural invasion is observed. These morphological features are consistent with adenoid cystic carcinoma.
2. Adenoid cystic carcinoma is a malignant salivary gland neoplasm predominantly composed of myoepithelial cells with a small component of epithelial cells. This carcinoma presents as cribriform, solid, tubular patterns or a mixture of these patterns. Immunohistochemistry for p63 highlights the myoepithelial cells whereas CD117 highlights the luminal epithelial cells.
3. Polymorphous adenocarcinoma has overlapping histological as well as immunohistochemical features with adenoid cystic carcinoma. In the former, cribriform pattern is usually not a predominant pattern. A combination of p63/p40 immunohistochemistry is helpful in distinguishing these two entities whereby adenoid cystic carcinoma is p63+/p40+ and polymorphous adenocarcinoma is p63+/p40-.

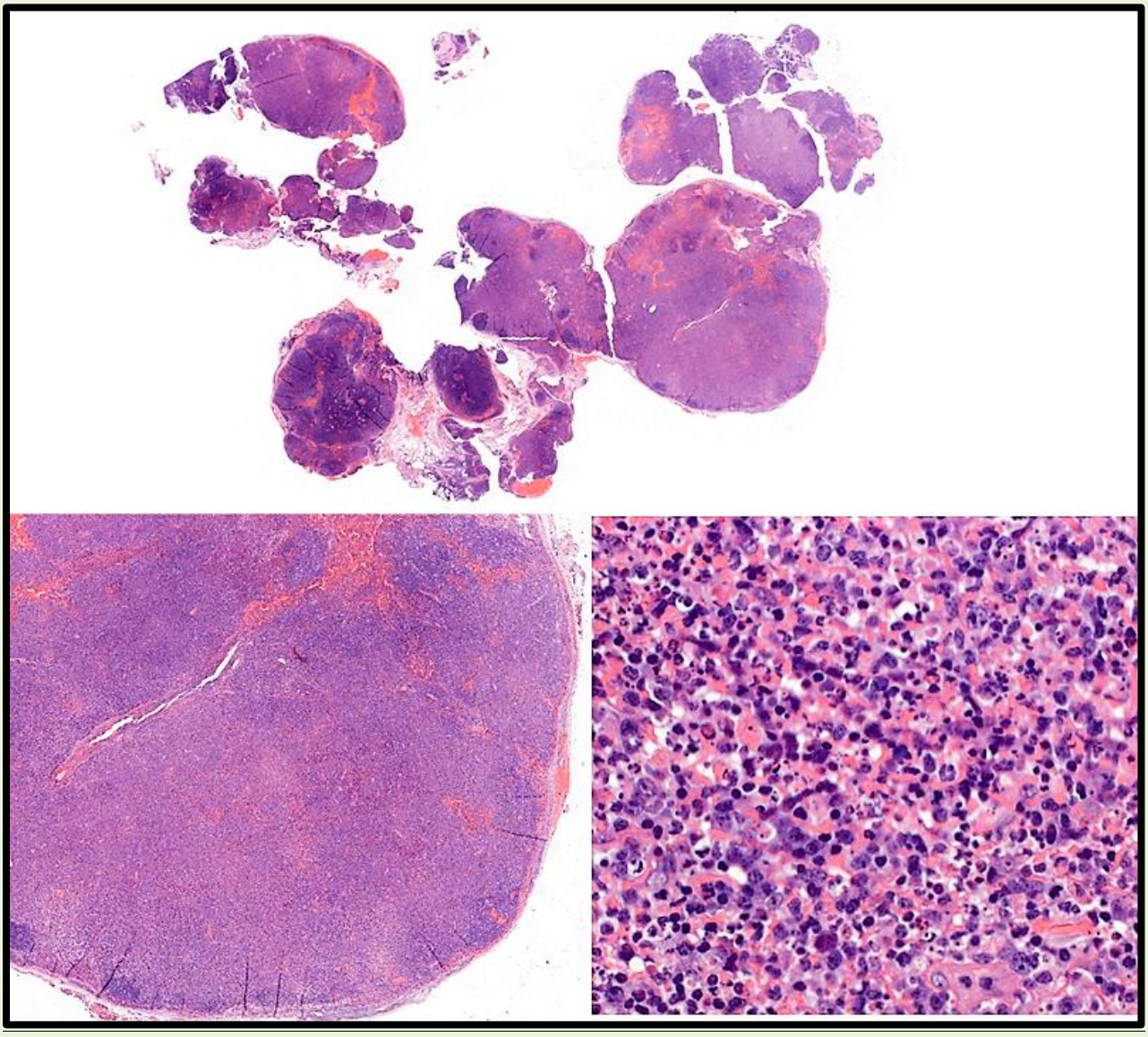
Reference

1. El-Naggar, Adel K., ed. WHO classification of head and neck tumours. International Agency for Research on Cancer, 2017.
2. Rooper, L., Sharma, R. and Bishop, J.A., 2015. Polymorphous low grade adenocarcinoma has a consistent p63+/p40− immunophenotype that helps distinguish it from adenoid cystic carcinoma and cellular pleomorphic adenoma. Head and neck pathology, 9(1), pp.79-84.

Case 19

Case 19: 30-year-old male. Transaminitis. Left cervical lymph node. One representative section.

Targeted Diagnosis: **Kikuchi-Fujimoto lymphadenopathy**



Case 19

Submitted Diagnoses by Participating Institutions	Number	
Kikuchi disease/ Kikuchi necrotizing lymphadenitis	15	Acceptable
Benign lymphadenitis favouring Kikuchi lymphadenitis; differential diagnosis: Infectious mononucleosis/ Necrotizing lymphadenitis, most likely Kikuchi disease. Differential include SLE/ Suggestive of Histiocytic Necrotizing Lymphadenitis (Kikuchi Disease). However, need to exclude T cell Lymphoma and Lupus Lymphadenitis	3	Acceptable
Infectious mononucleosis	2	Acceptable
Epstein-Barr Virus lymphadenitis, to exclude Hodgkin lymphoma by immunohistochemistry (CD20, CD30, CD15)	1	Acceptable
Hodgkin lymphoma, mixed cellularity	1	
Extramedullary hematopoiesis. Comment: IHC to confirm diagnosis - MPO, CD15, glycophorin, CD61, CD20 and CD3	1	

Educational notes:

1. There are fragments of lymphoid tissue with effaced nodal architecture. The paracortical region is expanded by a mixture of blast cells, small lymphocytes and histiocytes. This is associated with necrotic areas containing numerous apoptotic bodies without neutrophilic infiltrates. Characteristic histiocytes with crescentic nuclei are noted.
2. Recognition of the paracortical histiocytic necrotizing pattern without neutrophilic or eosinophilic infiltrates points towards Kikuchi-Fujimoto lymphadenopathy. Presence of immunoblasts may raise the suspicion of non-Hodgkin lymphomas. Immunohistochemistry would help to ascertain the diagnosis as histiocytes in Kikuchi-Fujimoto lymphadenopathy are specifically positive for MPO, CD68 and CD4. The lymphocytes are predominantly CD8 T-cells, including the immunoblasts.
3. SLE-associated lymphadenopathy has similar features as Kikuchi-Fujimoto lymphadenopathy. In the former, vasculitis, abundant plasma cells and presence of hematoxylin bodies are distinguishing features.
4. In infectious mononucleosis, there is paracortical hyperplasia associated with variable degree of follicular hyperplasia although foci of necrosis are common.

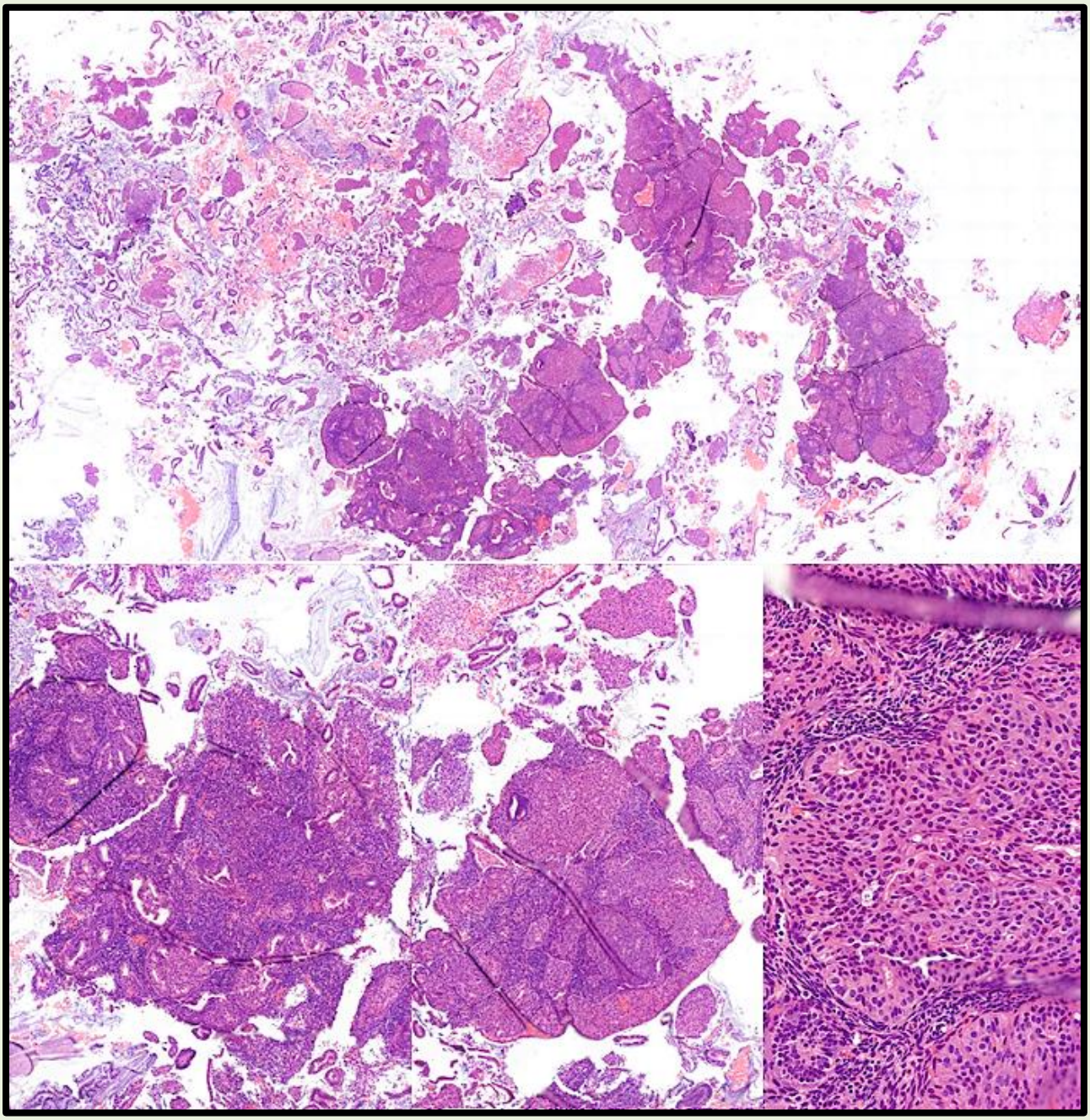
Reference

1. Cualing, Hernani D., Parul Bhargava, and Ramon L. Sandin. Non-neoplastic hematopathology and infections. John Wiley & Sons, 2012.
2. Ashton-Key, Margaret, Penny Wright, and Dennis Wright. Diagnostic Lymph Node Pathology. CRC Press, 2016.

Case 20

Case 20: 40-year-old female. Right ovarian cyst. Endometrial sampling. One representative section.

Targeted Diagnosis: **Morular metaplasia**



Case 20

Submitted Diagnoses by Participating Institutions	Number	
Endometrial hyperplasia without atypia, with extensive morular metaplasia/ florid squamous metaplasia	7	Acceptable
Squamous metaplasia of endometrium in a polyp	1	Acceptable
Atypical hyperplasia with florid squamous metaplasia/ Endometrial intraepithelial neoplasia	7	
Complex endometrial hyperplasia with atypia and extensive squamous morule. Well differentiated adenocarcinoma cannot totally be excluded. Suggest to repeat after complete hormonal therapy/ Atypical hyperplasia with squamous metaplasia, unable to exclude adjacent malignancy.	2	
Suspicious of poorly differentiated adenocarcinoma. Interpretation is limited by minimal tissue and limited clinical information.	1	
Extra-ovarian Brenner tumour/ Brenner tumour, benign/ Metastatic Brenner tumor of ovary	3	
Uterine tumour resembling ovarian sex cord tumour	1	
Differentials include: 1) High grade serous or endometrioid carcinoma probably metastatic or primary; with transitional cell like differentiation 2) Malignant transformation of a mature teratoma, likely squamous cell carcinoma 3) Malignant Brenners tumour, likely metastatic 4) Atypical endometrial hyperplasia	1	

Educational notes:

1. The endometrial sampling is limited by a few small fragments of endometrial tissue. Nonetheless, there are extensive morular metaplasia composed of cohesive sheets of immature squamous cells with focal glandular differentiation. Non-crowded endometrial glands lined by a layer of weakly proliferative endometrial epithelial lining without cytological atypia are observed.
2. Morular metaplasia can be found in normal endometrium, chronic irritative conditions such as endometritis, benign hyperplasia, atypical hyperplasia/endometrial intraepithelial neoplasia or endometrioid carcinoma. This metaplastic change is frequently associated with some degree of glandular crowding. However, this metaplastic change must be excluded from the endometrial glands-to-stroma ratio evaluation in considering endometrial hyperplasia. Morular component may have cribriform pattern, which is not indicative of carcinoma.
3. Morular metaplasia without EIN has the risks of 5% endometrial carcinoma whereas that associated with EIN has the risks of 19% on follow-up. As such, the finding of isolated squamous morules even without glandular abnormalities justifies resampling and careful follow-up.

Reference

1. Mallinger, W.D. and Quick, C.M., 2019. Benign and Premalignant Lesions of the Endometrium. Surgical pathology clinics, 12(2), pp.315-328.
2. Crum, C.P., Nucci, M.R., Granter, S.R., Howitt, B.E., Parast, M.M., Boyd, T., Lee, K.R. and Peters III, W.A., 2017. Diagnostic Gynecologic and Obstetric Pathology E-Book. Elsevier Health Sciences.