**HKCPath Anatomical Pathology Peer Review and Scores : PDF version for download**

**AP141 Bone Marrow: Metastatic Carcinoma from breast**

| Code | Case | Diagnosis | Comment | Score |
|---|---|---|---|---|
| 109 | AP141 | Metastatic carcinoma (100%) | Metastatic lobular carcinoma or ductal carcinoma have to be considered. Focal small tubule formation is seen in tumour cells in this biopsy. Correlation with previous breast excision pathology +/- immunostain for E-Cadherin is advised. | 100 |
| 123 | AP141 | Malignant cells present, consistent with metastatic lobular carcinoma from breast origin (100%) | Nil | 100 |
| 246 | AP141 | Metastatic carcinoma, consistent with breast primary. 100% | Nil | 100 |
| 333 | AP141 | Metastatic adenocarcinoma, suggestive of lobular carcinoma of breast | Confirm carcinoma by cytokeratin staining, BRST-2 for possible breast primary, and negative E-cadherin for lobular carcinoma of breast | 100 |
| 338 | AP141 | Metastatic carcinoma compatible with a breast primary. 100% | Nil | 100 |
| 369 | AP141 | Metastatic carcinoma, in keeping with breast primary. Megaloblastoid changes (ineffective erythropoiesis) of marrow. (100%) | Do epithelial stain, e.g. AE1/3, to confirm presence of metastatic carcinoma. | 100 |
| 448 | AP141 | Bone marrow trephine - 1.metastatic lobular carcinoma of breast 2.megaloblastic anemia (100%) | 1.Carcinoma cells can be highlighted by cytokeratin immunstain. 2.Megaloblastic anemia can be related to chemotherapy, although it is worth excluding Vitamin B12/folate deficiency. | 100 |
| 515 | AP141 | Metastatic adenocarcinoma with features consistent with chemotherapy changes, 100%. | Correlate clinically the temporal relationship of chemotherapy and this biopsy. | 100 |
| 517 | AP141 | metastatic carcinoma, suggestive of lobular carcinoma of breast 100% | Nil | 100 |
| 663 | AP141 | Metastatic carcinoma probably from a breast primary. (100%) | Nil | 100 |
| 763 | AP141 | Hypercellular marrow with malignant infiltration and erythroid hyperplasia. | Nil | 100 |

| Code | Case | Diagnosis | Comment | Score |
|---|---|---|---|---|
| | | Features compatible with metastatic adenocarcinoma, most likely of breast origin (100%) | | |
| 873 | AP141 | Suspicious of malignancy. Would perform epithelial markers to confirm metastatic carcinoma. Probability: 100% | Nil | 100 |
| 888 | AP141 | Hypercellular marrow with metastatic carcinoma (100%); co-existing changes of megaloblastic anaemia. | Perform immunohistochemical stain for cytokeratin to confirm presence of carcinoma cells. The discohesive and vacuolated nature of the cells suggest metastatic lobular carcinoma: correlation with previous histology and immunostain for E-cadherin are helpful. The marrow also shows megaloblastic features, probably related to chemotherapy; myelodysplastic syndrome has to be excluded. | 100 |
| 888.1 | AP141 | myeloproliferative disorder of non CML type and serous atropthy. | would do cytokeratin to exclude a metastatic carcinoma. | 30 |
| 911 | AP141 | Metastatic carcinoma | Nil | 100 |

Comment: Those who could identify a metastatic carcinoma scored 100. The serum B12 and red cell folate levels are normal. Previous mastectomy slides were not available for review.

**AP142: Central Neurocytoma**

| Code | Case | Diagnosis | Comment | Score |
|---|---|---|---|---|
| 109 | AP142 | Central neurocytoma (90%) Ependymoma(10%) | Immunostain for Synaptophysin and Glial fibrillary acidic protein will resolve the problem. The uniform round nuclei, with fine stippled chromatin, occasional small nucleoli and eccentric nuclei all speak for central neurocytoma. | 100 |
| 123 | AP142 | Central neurocytoma (100%) | nil | 100 |
| 246 | AP142 | Central neurocytoma. 100% | nil | 100 |
| 333 | AP142 | Central neurocytoma | Confirm by positive immunostaining for Synaptophysin, chromogranin and negative for GFAP. | 100 |
| 338 | AP142 | Central neurocytoma. 100% | nil | 100 |
| 369 | AP142 | Central neurocytoma. (100%) | nil | 100 |
| 448 | AP142 | Central Neurocytoma (100%) | nil | 100 |
| 515 | AP142 | Central neurocytoma, 100% | nil | 100 |
| 517 | AP142 | Central neurocytoma 100% | nil | 100 |
| 663 | AP142 | Central Neurocytoma (100%) | nil | 100 |
| 763 | AP142 | Central neurocytoma (100%) | nil | 100 |
| 873 | AP142 | Central neurocytoma. Probability: 100% | nil | 100 |
| 888 | AP142 | Central neurocytoma (90%); Ependymoma, cellular variant (10%). | The age of the patient favours the diagnosis of a central neurocytoma. To be confirmed by immunostain for synaptophysin (positive in central neurocytoma). | 100 |
| 888.1 | AP142 | central neurocytoma | nil | 100 |
| 911 | AP142 | central neurocytoma 80% ependymoma 20% | Central neurocytoma is immunoreactive for synaptophysin but not for GFAP, which distinguish it from ependymoma. | 100 |

**AP143 Skin: Eccrine Spiradenoma**

| Code | Case | Diagnosis | Comment | Score |
|---|---|---|---|---|
| 109 | AP143 | Eccrine spiradenoma (100%) | nil | 100 |
| 123 | AP143 | Eccrine spiradenoma (100%) | nil | 100 |
| 246 | AP143 | Eccrine spiradenoma. 100% | nil | 100 |
| 333 | AP143 | Eccrine spiradenoma | nil | 100 |
| 338 | AP143 | Eccrine spiradenoma. 100% | nil | 100 |
| 369 | AP143 | Eccrine spiradenoma. (100%) | nil | 100 |
| 448 | AP143 | Eccrine spiradenoma (100%) | nil | 100 |
| 515 | AP143 | Eccrine spiradenoma, 100% | nil | 100 |
| 517 | AP143 | Eccrine spiradenoma 100% | nil | 100 |
| 663 | AP143 | Eccrine Spiradenoma (100%) | nil | 100 |
| 763 | AP143 | Eccrine spiradenoma (100%) | nil | 100 |
| 873 | AP143 | Eccrine spiradenoma. Probability: 100% | nil | 100 |
| 888 | AP143 | Eccrine spiroadenoma (100%) | nil | 95 |
| 888.1 | AP143 | eccrine spiroadenoma | nil | 95 |
| 911 | AP143 | Eccrine spiradenoma | nil | 100 |

**AP144** Well differentiated hepatocellular carcinoma arising in a high-grade dysplastic nodule in a background of cirrhosis

| Code | Case | Diagnosis | Comment | Score |
|---|---|---|---|---|
| 109 | AP144 | Hepatocellular carcinoma in cirrhotic liver (100%) | Suggest reticulin stain for demonstration of thickened liver cell plates and decreased reticulin fibres. A number of Mallory bodies are found in the non-neoplastic liver cells, together with focal steatosis and nuclear vacuolation. Please check underlying cause of cirrhosis including Wilson’s disease and alcoholic liver disease. | 98 |
| 123 | AP144 | Hepatocellular carcinoma in a cirrhotic liver (100%) | nil | 98 |
| 246 | AP144 | Well-differentiated hepatocellular carcinoma; cirrhosis. 100% | nil | 98 |
| 333 | AP144 | Hepatocellular carcinoma | nil | 90 |
| 338 | AP144 | Well-differentiated hepatocellular carcinoma, grade 2 out of 4, arising from a background of cirrhosis, grade 2 activity. 100% | At the periphery of the tumor, there are features of dysplastic nodule. | 100 |
| 369 | AP144 | Focal nodular hyperplasia. (100%) | nil | 0 |
| 448 | AP144 | Liver - Well differentiated hepatocellular carcinoma, in a background of active macronodular cirrhosis (100%) | nil | 98 |
| 515 | AP144 | Well differentiated hepatocellular carcinoma (70%) vs dysplastic nodule (30%); with a background of cirrhosis. | Need to perform reticulin stain to look for lost of reticulin framework and thickened trabecular pattern. Hepatocellular carcinoma shows extensive loss of reticulin and frequent thick cell plates (> 3 cells). Dysplastic nodule shows focal loss of reticulin. Thick cell plates are less frequently found. | 90 |
| 517 | AP144 | Well Differentiated hepatocellular carcinoma 70% Focal nodular hyperplasia 30% | Suggest further sampling to assess presence of nuclear pleomorphism and architectural abnormality. | 65 |
| 663 | AP144 | Well-differentiated Hepatocellular Carcinoma in a background of cirrhosis (100%) | As adjacent tissue shows relatively dense mononuclear infiltrate of septa and portal tracts, suggest correlation with serologic markers (HBsAg & | 99 |

| Code | Case | Diagnosis | Comment | Score |
|---|---|---|---|---|
| | | | anti-HCV antibody) to determine etiology of tumor and cirrhosis. Suggest reticulin stain to search for presence of pre-existing dysplastic nodule from which the hepatocellular carcinoma arises. | |
| 763 | AP144 | Well-differentiated hepatocellular carcinoma in a background of cirrhosis (100%) | nil | 98 |
| 873 | AP144 | Hepatocellular carcinoma in cirrhotic liver.<br>Probability: 100% | nil | 98 |
| 888 | AP144 | Well differentiated hepatocellular carcinoma (100%); cirrhosis. | The uninvolved liver shows cirrhosis containing also Mallory hyaline bodies; correlation with clinical and serological findings is suggested for possible association with alcoholism or HBV infection. | 98 |
| 888.1 | AP144 | focal nodular hyperplasia | would do reticulin stain, pCEA , CD34 to exclude a well differentiated hepatocellular carcinoma. | 15 |
| 911 | AP144 | hepatocellular carcinoma | nil | 90 |

**Comment:** This case is intended to show a dysplastic nodule (DN) transforming into hepatocellular carcinoma (HCC). The carcinoma is sufficiently diagnostic on H&E with the degree of architectural and nuclear abnormality and nodule-in-nodule pattern.

Most participants cannot point out the presence of a pre-existing DN; only 2 marks are deducted in this case as HCC has already arisen and the eventual outcome of the patient is not much affected irrespective of whether the pre-existing DN is recognised. Those who have not mentioned the presence of cirrhosis have a further 8 marks deducted because of an incomplete diagnosis which has an important impact on the prognosis. Participants 515 and 517 cannot definitely diagnose HCC based on H&E stain and have more marks deducted. Focal nodular hyperplasia is a totally invalid differential diagnosis, and hence no score.

In this case, you can easily compare side by side the cytological and architectural features of a DN with non-neoplastic hepatocytes and HCC. Just like dysplasia in other epithelia, the N/C ratio is highest in the high-grade dysplastic hepatocytes with much less cytoplasm than normal or carcinomatous hepatocytes. They are also more uniformly looking. The cell plates are 2-3 cell thick and not discontinuous, without significant loss of reticulin or extensive CD34 staining as in HCC (see photos). A definitive high-grade DN should be treated like HCC by less aggressive means.

**AP145** Upper lip: Merkel cell carcinoma

| Code | Case | Diagnosis | Comment | Score |
|---|---|---|---|---|
| 109 | AP145 | Merkel cell carcinoma (95%) Metastatic small cell carcinoma (5%) | Merkel cell carcinoma is positive for CK20 and negative for Thyroid Transcription Factor (TTF-1). | 100 |
| 123 | AP145 | Merkel cell carcinoma (100%) | Immunohistochemical study to exclude metastatic small cell carcinoma. Merkel cell carcinoma is CK20 positive. Metastatic small cell carcinomas are almost always CK20 negative. | 100 |
| 246 | AP145 | Small cell carcinoma, consistent with Merkel cell carcinoma. Need to rule out metastatic small cell carcinoma. 100% | nil | 100 |
| 333 | AP145 | Merkel cell carcinoma | Confirm by positive staining for CK20 and synaptophysin. Exclude lymphoma/leukemia by LCA negativity. | 100 |
| 338 | AP145 | Merkel cell carcinoma. 100% | nil | 100 |
| 369 | AP145 | Merkel cell carcinoma. (100%) | nil | 100 |
| 448 | AP145 | Skin - Merkel cell carcinoma (100%) | Covering skin also features verrucous hyperplasia resembling a wart. Immunostain CK20 positivity confirms the diagnosis. | 100 |
| 515 | AP145 | Merkel cell carcinoma, 100% | To be confirmed with cytokeratin 20 (CK20) immunohistochemically. Merkel cell carcinoma is CK20 positive. | 100 |
| 517 | AP145 | Merkel cell carcinoma 100% | nil | 100 |
| 663 | AP145 | Neuroendocrine carcinoma (Merkel cell carcinoma), margins involved. (100%) | Immunostaining for CK20 and neurofilament will differentiate Merkel cell carcinoma from metastatic small cell carcinoma. It is also necessary to exclude other primary sites of neuroendocrine carcinoma (small cell carcinoma), in particular the lung. | 100 |
| 763 | AP145 | Merkel cell carcinoma (100%) | nil | 100 |
| 873 | AP145 | Merkel cell carcinoma, would perform CK20, also other markers to exclude leukaemia and lymphoma. Probability: 100% | nil | 100 |

| Code | Case | Diagnosis | Comment | Score |
|---|---|---|---|---|
| 888 | AP145 | Merkel cell carcinoma (100%) | Confirm by immunostain for CK20. | 100 |
| 888.1 | AP145 | Merkel cell carcinoma | TTF1 and CK20 to exclude a metastatic small cell carcinoma and LCA to exclude lymphoma | 100 |
| 911 | AP145 | Merkel cell carcinoma | nil | 100 |

Comment: This is a typical case presenting as a small round cell tumor with some degree of cohesion, and dot immunoreactivity for cytokeratin AE1/E3 and CK 20, also intense immunoreactivity for chromogranin, synaptophysin, and NSE. Pertinent negative immunostains include CK7, TTF-1, LCA, HMB45. We did not examine EM in this case, but ultrastructures would be characterized by the presence of membrane bound dense neurosecretory granules and paranuclear aggregates of cytokeratin filaments. There has been recent observation of c-KIT (CD117) expression in Merkel cell carcinoma, but we did not tested this case.

**AP 146** Malignant mesothelioma with deciduoid features

| Code | Case | Diagnosis | Comment | Score |
|---|---|---|---|---|
| 109 | AP146 | Malignant Mesothelioma (90%) Metastatic carcinoma (10%) | Immunostain for mesothelial marker (eg. Calretinin) and true epithelial marker (eg. BerEP4 and monoclonal CEA) +/- electron microscopic examination is advised. | 100 |
| 123 | AP146 | Malignant tumour (100%), favour mesothelioma. Differential diagnoses are poorly differentiated carcinoma, germ cell tumour. | Immunohistochemical study for confirmation. Mesothelioma is positive for calretinin, negative for BerEP4, MOC-31 and CEA. Germ cell tumour may be positive for AFP, PLAP. | 100 |
| 246 | AP146 | Mesothelioma. 90% Adenocarcinoma. 10% | Perform a panel of immuohistochemical stains and EM to reach a conclusive diagnosis. Clinical history of asbestoes exposure relevant. | 95 |
| 333 | AP146 | Malignant tumor, favor malignant mesothelioma (90%)Ddx carcinoma (5%), melanoma (5%) | Immunostaining for CK5/6, calretinin (+ in mesothelioma), BerEP4, MOC31 (+ in carcinoma, - in mesothelioma & melanoma) and S100 (+ in melanoma) | 100 |
| 338 | AP146 | Malignant mesothelioma with deciduoid features. 100 % | Nil | 100 |
| 369 | AP146 | Malignant mesothelioma. (100%) | Nil | 100 |
| 448 | AP146 | Peritoneum nodules - Malignant mesothelioma (100%) | Tumour cells are almost exclusively epithelioid and deciduoid. Immunostains calretinin, CK5/6(+ve) and BerEP4 (-ve) can help to confirm the diagnosis. | 100 |
| 515 | AP146 | Malignant mesothelioma, 90% Metastatic adenocarcinoma, 10% | Need to confirm the mesothelial nature by calretinin immunohistochemically or/and electon microscopy to look for the presence of very long microvilli with length/width > 10/1. If negative, try to establish the primary source by cytokeratin profile (CK7 and CK20). | 100 |
| 517 | AP146 | Malignant mesothelioma 70% metastatic carcinoma 30% | Suggest immunohistochemical staining for calretinin, Ber-EP4, CEA to confirm the diagnosis. | 100 |
| 663 | AP146 | Malignant neoplasm, favor mesothelioma. (100%) | To be confirmed by immunohistochemical and | 95 |

| Code | Case | Diagnosis | Comment | Score |
|---|---|---|---|---|
| | | | ultrastructural studies. Differential diagnoses include other types of malignant tumors like metastatic carcinoma, sarcoma and melanoma etc. | |
| 763 | AP146 | Malignant mesothelioma, epithelial type (100%) | nil | 100 |
| 873 | AP146 | Favour mesothelioma. Confirm with calretinin (+ve) and Ber-EP4 (-ve), also exclude hepatoid tumor, e.g. carcinoma of liver, stomach and germ cell tumor. Probability: 100% Probability: 100% | nil | 100 |
| 873 | AP146 | Favour mesothelioma. Confirm with calretinin (+ve) and Ber-EP4 (-ve), also exclude hepatoid tumor, e.g. carcinoma of liver, stomach and germ cell tumor. Probability: 100% | nil | 100 |
| 888 | AP146 | Malignant tumour (100%); differential diagnoses include mesothelioma (80%), metastatic carcinoma (15%) and metastatic melanoma (5%). | Perform panel of immunostains including: CK5/6, calretinin and HBME-1 for mesothelioma; cytokeratin, CEA, BerEP4 and LeuM1 for carcinoma; and HMB45 for melanoma. Ultrastructural studies for microvilli as in mesothelioma. | 100 |
| 888.1 | AP146 | Deciduoid mesothelioma | panel of mesothelial and carcinoma marker will be performed which incl EMA, CK5/6, thromobomodulin , calretinin for mesothelioma and EP4, AUA1 and CEA for carcinoma. | 100 |
| 911 | AP146 | Mesothelioma | nil | 100 |

**Comment:** This is the peritoneal biopsy of the mesothelioma previously put up as AP135 (cytology case). The malignant cells are positive for calretinin, cytokeratin and vimentin but not for CEA, Leu M1, BerEP4, S-100 protein, HMB 45, actin, desmin, heppar 1, CD 45 and ALK-1, hence confirming their mesothelial nature.

Most participants score full marks, except 246 and 663 whose comments are not specific enough.