Tumour budding (Non-core)

Tumour budding is defined as single cells or clusters of up to 4 tumour cells at the invasive front of invasive carcinomas. It is considered to be the morphological manifestation of epithelial mesenchymal transition.[1] Tumour budding is different from tumour grade (based on gland formation) and poorly differentiated clusters (≥5 cells).

There is increasing evidence that tumour budding is an independent adverse prognostic factor in colorectal carcinoma. Several studies have shown that pT1 colorectal carcinomas, including malignant polyps, with tumour budding score Bd2 and Bd3 (≥5 buds) are associated with an increased risk of lymph node metastasis.[2-6] For stage II colorectal carcinomas, tumour budding score Bd3 is associated with increased risk of recurrence and mortality.[7-9]

Tumour budding is reported as the number of buds and scored using a three-tiered system. According to the recommendations from a consensus conference on tumour budding,[10] the number of tumour buds is the highest count after scanning 10 separate fields (20x objective lens) along the invasive front of the tumour or the entire lesion for malignant polyps ('hotspot' approach). The count of tumour buds is only performed in non-mucinous, non-signet-ring cell adenocarcinoma areas. The number of tumour buds is counted on haematoxylin and eosin (H&E). If the invasive front of the tumour is obscured by inflammatory cells, immunohistochemistry using pan-cytokeratin can be used to help identifying the buds, but the final count is performed on H&E. Depending on the eyepiece field number diameter of the microscope, the number of buds may need to be normalised to represent the number for a field of 0.785 mm^2 (objective lens 20x with eyepiece diameter of 20 mm).

Tumour budding should only be reported in non-mucinous and non-signet-ring cell adenocarcinoma areas.

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