Lymphatic and venous invasion (Core)

For colorectal cancer, it is important to report the presence or absence of lymphovascular invasion and to classify this further according to the type of vessels involved and, for veins, their intramural or extramural location, as these features may have different clinical and prognostic implications. Extramural (beyond muscularis propria) venous invasion has been demonstrated on multivariate analysis by multiple studies to be a stage independent adverse prognostic factor for colonic and rectal cancer.[1] There is also evidence from several studies that intramural (intramuscular or submucosal) venous spread is also of prognostic importance but the evidence is much weaker than for extramural venous invasion.[2-4]

Venous invasion is defined as tumour present within an endothelium-lined space that is either surrounded by a rim of muscle or contains red blood cells.[5] It should be suspected in the presence of a rounded or elongated deposit of tumour beside an artery. Interpretation of such features is subjective and can be improved by the application of immunohistochemical and histochemical stains, in particular elastic staining to identify venous elastic lamina.[3,6-10] A circumscribed tumour nodule surrounded by a smooth muscle wall or an identifiable elastic lamina, evident on haematoxylin and eosin (H&E) or elastic stains, is considered sufficient to classify as venous invasion. Examination of multiple levels in blocks showing features suspicious of venous invasion can also be helpful in borderline cases.

Small vessel invasion should be reported separately from venous (large vessel) invasion. Small vessel invasion is defined as tumour involvement of thin-walled structures lined by endothelium, without an identifiable smooth muscle layer or elastic lamina. Small vessels may represent lymphatics, capillaries or post-capillary venules. Lymphatics and venules may be distinguished by D2-40 immuno-histochemistry, which only stains lymphatic endothelial cells, not venular, but this is not routinely recommended in reporting surgical resection specimens. All forms of small vessel invasion are considered under the 'L' classification under Union for International Cancer Control (UICC)/American Joint Committee on Cancer (AJCC) TNM 8th editions.[11,12] Small vessel invasion is associated with lymph node metastatic disease and has been shown to be an independent indicator of adverse outcome in some but not all studies.[2,13-15] A higher prognostic significance of extramural small vessel invasion has been suggested, but the importance of anatomic location in small vessel invasion is not well established.[2]

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