

Lymphovascular invasion in primary breast carcinoma

(Core and Non-core)

The presence of lymphovascular invasion (LVI) is an adverse feature providing independent prognostic information about both local recurrence and survival. It is therefore important to record whether or not it is present. Reporting the LVI status for stage IIA and IIB patients who have an axillary lymph node dissection may influence the use of adjuvant radiotherapy.

As it is difficult to distinguish between lymphatic and venous channels, findings should be categorised as LVI rather than define a specific channel. This is supported by evidence identifying that most tumour emboli are present in lymphatic channels.¹

The presence of unequivocal tumour in lymphovascular spaces should be recorded. 'Indeterminate' may be used where it is equivocal or uncertain. If there is doubt about the presence of tumour in lymphovascular spaces, but it is considered to be very likely, it should be recorded as 'indeterminate'.

Useful criteria for recognition of LVI include:

- Groups of tumour cells in spaces around the main tumour mass; ensure that any spaces are lined by a rim of endothelial cells and are not fat spaces.
- The presence of adjacent channels that may be of varying sizes.
- The presence within the space of lymphocytes, erythrocytes and/or thrombus. Note that true blood vascular involvement in the breast is rare.
- Shrinkage artefact results in nests of cells having the shape of the space in which they lie; and endothelial cells will not be seen.

The best method for assessing LVI is the use of good quality, optimally fixed and processed haematoxylin-eosin (H&E) stained sections. Immunostaining for endothelial and/or lymphoendothelial markers does not generally contribute further but could be considered for difficult critical cases. Shrinkage artefact may also involve ductal carcinoma in situ (DCIS), where the myoepithelial layer may mimic endothelial cells, and it should be recognised that both lymphatic endothelial cells and myoepithelial cells stain positively with the lymphendothelial marker podoplanin/D2-40 antibody.

One of the major problems in trying to determine whether or not tumour cells are in a vessel is shrinkage artefact, so care should be taken, wherever possible, to ensure that there is optimal tissue fixation and processing.

Only LVI identified in breast tissue associated with the primary breast carcinoma should be recorded. LVI identified elsewhere, for example in axillary tissue, may be described but not recorded formally as LVI positive. Perineural invasion should not be recorded as LVI. Documenting the presence of dermal LVI is valuable because of its strong association with the clinical findings of inflammatory breast carcinoma.

There is no agreed definition of extensive LVI and no substantive evidence base. Sub categorisation of LVI as extensive or non-extensive is therefore subjective and considered optional/non-core.

Reference

- 1 Mohammed RA, Martin SG, Gill MS, Green AR, Paish EC and Ellis IO (2007). Improved methods of detection of lymphovascular invasion demonstrate that it is the predominant method of vascular invasion in breast cancer and has important clinical consequences. *Am J Surg Pathol* 31(12):1825-1833.