

## Lymphovascular invasion (Core)

The presence or absence of lymphovascular invasion (LVI) in uterine sarcomas should be documented. For some tumours, such as low grade and high grade endometrial stromal sarcoma, LVI is frequently encountered; in contrast, other tumours, such as adenosarcomas, uncommonly demonstrate LVI unless associated with deep myometrial invasion and/or sarcomatous overgrowth. The presence of LVI may carry prognostic significance in leiomyosarcoma, particularly when early stage,<sup>1,2</sup> and in adenosarcoma.<sup>3-5</sup>

One study evaluated specific patterns of vascular involvement by low grade endometrial stromal sarcoma, high grade endometrial stromal sarcoma, leiomyosarcoma, and undifferentiated uterine sarcoma and divided patterns into 'true' vascular invasion versus 'intrusion' into lymphovascular spaces.<sup>6</sup> True LVI was characterised by dyscohesive clusters of tumour cells with irregular edges, lacking vasculature within the intravascular tumour and/or lack of immunohistochemically proven endothelial cells surrounding the intravascular tumour focus. Vascular intrusion, which was considered to be 'pseudoinvasion', was characterised by cohesive intravascular tumour with smooth contours and lined by endothelial cells. Pre-existing vascular spaces were frequently identified within the intravascular tumour in the cases of vascular intrusion and such foci were often in direct communication with the main tumour mass.<sup>6</sup>

While usually straightforward, the assessment of LVI may be difficult in a minority of cases, for which the reasons may include (but are not limited to) suboptimal fixation or cauterization artefacts. In such cases, examination of multiple levels and/or immunostaining for endothelial or lymphatic markers (such as CD31, CD34, D2-40 and ERG) may be employed to assist with the decision-making. Cases that are still equivocal after taking additional steps may be reported as 'indeterminate' for LVI, but this designation should only be sparingly used and it is useful to provide the reason in a comment in the report.

## References

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- 5 Yuan Z, Shen K, Yang J, Cao D, Zhang Y, Zhou H, Wu H and Yu M (2019). Uterine Adenosarcoma: A Retrospective 12-Year Single-Center Study. *Front Oncol* 9:237.
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