

Visceral pleural invasion (Core)

Reason/Evidentiary Support:

The presence of tumour at the surface of the visceral pleura has been recognized as an independent adverse prognostic factor for quite some time.¹ More recently, penetration through the visceral pleural elastic layer was shown to have the same prognostic impact.^{2,3} With the release of the current staging classification, criteria for visceral pleural invasion (VPI) have been more clearly defined to encompass both invasion beyond the visceral pleural elastic layer and extension to the visceral pleural surface.⁴ For tumours that are in contact with the visceral pleura and do not clearly extend to the visceral pleural surface, elastic stains can aid in the detection of tumour cells beyond the visceral pleural elastic layer.

Often, there is not one, but two perceptible visceral pleural elastic layers. In most individuals, the elastic layer that is closer to the surface of the visceral pleura, typically referred to as the outer or external elastic layer, is thicker and more continuous, while within the visceral pleural connective tissue adjacent to the alveolar parenchyma lies a less prominent and/or somewhat fragmented internal (inner) elastic layer. It is the recommendation of the International Staging Committee that the thickest elastic layer be used to assess VPI.⁴ Occasionally, tumour cells are intermingled with fibres of the visceral pleural elastic layer without unequivocally penetrating beyond the visceral pleural elastic layer. This should not be interpreted as evidence of VPI.

A small percentage of cases is indeterminate for VPI. Occasionally, the visceral pleural elastic layer is imperceptible, even on elastic stains, in cases where tumour is in contact with the visceral pleura but does not extend to the visceral pleural surface. In such circumstances, the TNM classification dictates that the lower category be assigned (i.e. tumours should not be upstaged on the basis of equivocal VPI).⁵ So too is the case when the visceral pleura in the vicinity of a tumour is fibrotic or elastotic to the point of obscuring the normal visceral pleural elastic landmarks so that elastin stains are difficult if not impossible to interpret. Rarely, due to adhesions or other technical factors, a specimen is received devoid of visceral pleura overlying a tumour and it is simply not possible to assess VPI.

Data on tumours that cross an interlobar fissure into an adjacent ipsilateral lobe but are not present on the visceral pleural surface are limited, but under current staging recommendations, are categorized as T2.⁴

References

- 1 Mountain CF, Carr DT and Anderson WA (1974). A system for the clinical staging of lung cancer. *Am J Roentgenol Radium Ther Nucl Med.* 120:130-138.
- 2 Shimizu K, Yoshida J and Nagai K et al (2004). Visceral pleural invasion classification in non-small cell lung cancer: a proposal on the basis of outcome assessment. *J Thorac Cardiovasc Surg.* 127(6):1574-1578.
- 3 Osaki T, Nagashima A, Yoshimatsu T, Yamada S and Yasumoto K (2004). Visceral pleural involvement in nonsmall cell lung cancer: prognostic significance. *Ann Thorac Surg* 77:1769-1773.
- 4 Travis WD, Brambilla E, Rami-Porta R, Vallières E, Tsuboi M, Rusch V and Goldstraw P (2008). Visceral pleural invasion: pathologic criteria and use of elastic stains: proposal for the 7th edition of the TNM classification for lung cancer. *J Thorac Oncol* 3(12):1384–1390.
- 5 Amin MB, Edge SB and Greene FL et al (eds) (2017). *AJCC Cancer Staging Manual. 8th ed.*, Springer, New York.