Molecular analysis of lymph node metastases for more reliable staging in colorectal cancer

Lymph node status is a critical factor to predict outcomes and identify patients eligible for chemotherapy. Although histopathology based on H&E is a standard method for lymph node analysis, 30% of patients diagnosed with negative lymph nodes develop recurrences, likely due to undetected metastases. The major limitation of histopathology is that only a tiny volume of the lymph node is assessed, leaving most parts of the node unanalysed. Molecular analysis of the whole lymph node by OSNA can accurately detect the presence of metastases, even very small metastases. OSNA can provide an accurate staging and help to identify patients with a high risk of recurrence. Recent data shows that the OSNA results provide also valuable prognostic information on a patient’s survival.

Molecular analysis of lymph node metastases – evolution of the clinical value

OSNA versus histology: 97% concordance, 95% sensitivity, 97% specificity
Upstaging of 25% pN0 patients
Detection of lymph nodes most prone to carry metastases
Better selection of high-risk patients
OSNA positivity leads to worse survival rates

Performance evaluation
For more accurate staging
Molecular upstaging
For increased sensitivity
Lymph node mapping
For improved harvesting
Total tumour load (TTL)
For molecular staging
Prognostic value
For clinical decision


OSNA positivity leads to worse survival rates
Matsuura N et al. (2017): Ann of Oncol. 28(suppl_5) v158 – v208.

Reduced time to systemic therapy

Pooling of nodes for an easier workflow

TTL correlates with high risk factors

Better selection of high-risk patients

Detection of lymph nodes most prone to carry metastases

For molecular staging

Performance evaluation
Molecular upstaging
Lymph node mapping

Surg Endosc. 31(2):723 – 33.
Virchows Arch. 496(4):385 – 94.
Virchows Arch. 28(suppl_5) v158 – v208.
Dig Liver Dis. pii: 49(8):924 – 8.

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OSNA – molecular analysis of lymph node metastases for more reliable staging in colorectal cancer

Selected publications


Key message: OSNA positivity correlates with a worse three-year DFS demonstrating the prognostic value of molecular staging in early-stage CRC patients.


Key message: In comparison with conventional histopathology, OSNA can almost halve the time between surgery and administration of chemotherapy from 67 days to 35 days.


Key message: Pooling lymph nodes is a new method allowing to analyse a high number of lymph nodes simultaneously and providing the patient’s tumour burden, measured as the TTL.


Key message: The TTL is the sum of CK19 mRNA copy numbers of each positive lymph node. TTL is an objective and quantitative measure that may better support the staging of early colorectal cancer patients.


Key message: Endoscopic tattooing allows to analyse the lymph nodes, which most likely hold metastases, and increase the number of harvested lymph nodes.


Key message: The sum of OSNA quantitative results, called ‘total tumour load’ (TTL), has shown to increase as the number of positive lymph nodes increased.


Key message: Ex-vivo sentinel lymph node mapping (SLNM) has shown to improve staging with high accuracy (90 – 100 %) and an upstaging rate of 19 – 57 %. In combination with OSNA, SLNM may raise the detection of positive lymph nodes and provide a reliable basis for staging.


Key message: 25 % of initially histology-negative lymph node patients were upstaged thanks to the analysis of the whole lymph nodes by OSNA.


Key message: The sum of OSNA quantitative results, called ‘total tumour load’ (TTL), has shown to increase as the number of positive lymph nodes increased.


Key message: OSNA has shown to be equivalent to the 2-mm-interval histopathology and can improve the detection of metastases by analysing the whole lymph node.