

DETERMINANTS OF FALSE NEGATIVE RESULTS IN NON-SMALL CELL LUNG CANCER STAGING BY EBUS-NA

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Background: False negative (FN) results of EBUS-NA in NSCLC staging have shown significant variability in previous series. The aim of our study was to identify tumour- and procedure-related determinants of EBUS-NA FN results.

Methods: We conducted a prospective study that included NSCLC patients staged as N0/N1 by EBUS-NA and undergoing therapeutic surgery. Frequency of FN results in the mediastinum was calculated and tumour- and procedure-related determinants of FN results in stations reachable and non-reachable by EBUS-NA were determined by multivariate logistic regression.

Results: EBUS-NA obtained adequate samples from a median of two (IQR 1-2) mediastinal stations, and achieved adequate sampling of three stations in 41 patients (24.8%). Pathologic staging after surgery identified EBUS-NA FN procedures for mediastinal malignancy in 23 participants (13.9%), with metastasis in >1 mediastinal station in two of them. FN results were observed mainly in stations reachable by EBUS-NA (17, 10.3%), and less often in stations beyond the reach of EBUS-NA (7, 4.2%). FN results were related to the extensiveness of EBUS-NA sampling, with a low prevalence (2.4%) when sampling of three mediastinal stations was satisfactory, rising above 10% when this requirement was not fulfilled ($p=0.043$). The inverse relationship between the extensiveness of EBUS-NA sampling and FN results was only found for results in reachable stations ($p=0.038$, chi-square). FN results in non-reachable stations were independent of the extensiveness of sampling and related to tumour location. Six out of seven cases (85.7%) with FN results in stations non-reachable by EBUS-NA were observed in tumours in the left lung (upper=2 and lower=4), with a statistically significant difference with respect to right-sided tumours ($p=0.012$, Fisher's exact test). The assessment of determinants of FN results in NSCLC staging by EBUS-NA in a multivariate model confirmed that statistically significant risk factors for FN results in stations reachable by EBUS-NA were an abnormal mediastinum on CT/PET (OR 7.77; 95%CI 2.19-27.51, $p=0.001$), and the extensiveness of satisfactory sampling of mediastinal stations (OR 0.37, 95%CI 0.16-0.89, $p=0.026$). Location of LC was the only criterion for non-reachable nodes, with a higher risk in left-sided tumours (OR 10.11, 95%CI 1.17-87.52, $p=0.036$).

Conclusions: EBUS-NA FN results were observed in nearly 15% of NSCLC patients but reduced to 3% when satisfactory samples from three mediastinal stations were obtained. FN results in stations reachable by EBUS-NA were associated with the extensiveness of sampling, and, in stations out of reach of EBUS-NA, with left-sided primary tumours.

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