Differentiating Non-small Cell Lung Carcinoma: Doublet of Immunohistochemistry for Safety

Agita Jukna [1], *Ilze Štrumfa* [1], *Andrejs Vanags* [2], *Jānis Gardovskis* [2]

Rīga Stradiņš University, Latvia
[1] *Department of Pathology*
[2] *Department of Surgery*

Introduction. In recent years, immunohistochemistry (IHC) has been recommended as an almost mandatory adjunct in lung cancer diagnostics. Contrasting with the earlier approach, IHC has been added to the diagnostic criteria included in the new World Health Organisation (WHO) classification of lung tumours. Accurate subtyping of non-small cell lung carcinoma (NSCLC) is crucial to ensure the criteria of precision medicine: the right drug, to the right patient, at the right time, as certain drugs have been approved for specific subgroups of NSCLC. Large cell carcinoma (LCC) is a diagnosis reserved for surgical specimens only; it shows the impossibility to specify the histological subtype of lung carcinoma.

Aim, Materials and Methods. The aim of the study was to evaluate expression of TTF-1, napsin A, p63, p40 and diagnostic yield of the combined IHC panel in primary non-small cell lung carcinomas.

The retrospective study included 29 consecutive patients who underwent radical pulmonary surgery due to primary NSCLC. Histological subtyping was performed in accordance with lung tumour classification by the WHO, 2015. Expression of TTF-1, napsin A, p63 and p40 was detected by immunohistochemistry and evaluated as positive versus negative using cut-off level at 5% of positive tumour cells. Descriptive statistical analysis was performed.

Results. The study group comprised 29 primary NSCLC. After the evaluation of haematoxylin-eosin stained slides, there were seven (24.1%; 95% confidence interval (CI) = 12.2–42.1) adenocarcinomas, ten (34.5%; CI = 19.9–52.7) squamous cell carcinomas and twelve (41.4%; CI = 25.5–59.3) non-small cell carcinomas, not otherwise specified (NOS).

The immunohistochemical assessment with four markers allowed to subclassify further the histological type of nine (75.0%; CI = 46.8–91.1) NSCLC, NOS. Among these cases, there were four (33.3%; CI = 13.8–60.9) adenocarcinomas of which three (25.0%; CI = 8.9–53.2) showed positive staining with both TTF-1 and napsin A, while one case (8.3%; CI = 1.5–35.4) expressed only napsin A. Another five (41.7%; CI = 19.3–68.1) NSCLC, NOS were classified as squamous cell carcinomas with only two (16.7%; CI = 4.7–44.8) cases showing positive double staining for p63 and p40. In contrast with a four-marker approach, different combinations of two markers specified the diagnosis of NSCLC, NOS in 33.3% (CI = 13.8–60.9) of cases.

Conclusions. The histological differentiation of non-small cell lung carcinomas that lack specific morphological features characteristic to adenocarcinoma or squamous cell carcinoma should include double markers of both adenocarcinoma and squamous cell carcinoma as such approach increases the ability to specify histological subtype of NSCLC, NOS up to three quarters of cases.