CORRELATION OF MACROSCOPIC AND CYTOMORPHOLOGICAL FEATURES IN PLEURAL EFFUSIONS

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Objective:

Aim: To correlate a macroscopic feature and final cytomorphological diagnosis of pleural effusions (PEs).

Methods: This retrospective study included cytological final reports and macroscopic data of 1007 PEs processed at the Division of pulmonary cytology during six-year time period. Optimal volume range of submitted PEs was 20 mL to 40 mL according to references. The PEs under 20 mL were also cytologically processed. All PEs were subjected to macroscopic assessment (the presence or absence of blood, and clarity) and classified as non-hemorrhagic (non-HEM), blood-tinged (BT), hemorrhagic (HEM), and coagulated-hemorrhagic (coagulated-HEM). The final cytological diagnoses (adenocarcinoma, mesothelioma, suspicious for malignant (SFM), and non-adequate for cytomorphological interpretation) were determined based on microscopic analysis of May Grünewald Giemsa-stained PE smears and cytospins. The immunocytochemistry (ICC) was used when necessary. The remaining volume of malignant PEs was prepared as cellblock (CB). Cellularity of ICC and CB slides was classified as optimal or non-adequate based on the semiquantitative assessment of malignant cells. The results were compared to literature data.

Results: Among 971 PEs with optimal volume were 526 (54.2%) adenocarcinomas and 54 (5.6%) mesotheliomas. Further, 290 (29.9%) PEs were SFM while 101 (10.4%) were not adequate for final diagnosis. Adenocarcinomas were more frequent in BT (178; 33.8%) and HEM (174; 33.1%) while mesotheliomas in non-HEM (23; 42.6%) PEs ($p< 0.001$). More non-adequate (16; 15.8%) and SFM (17; 5.9%) diagnoses were in coagulated-HEM PEs ($p< 0.001$). The ICC was used on 139 (23.9%) malignant PEs. It was more frequently used on BT (41; 29.5%) and HEM (44; 31.7%) malignant PEs ($p< 0.001$). There was no significant difference between cellularity of ICC-stained slides and macroscopic feature of PEs. The CB was prepared for 177 (30.5%) malignant PEs. The CB cellularity was optimal in HEM (14; 7.9%) while without malignant cells in non-HEM (42; 23.7%) PEs ($p< 0.001$). Only 36 (3.6%) PEs were under 20 mL (min 0.5 mL; max 8.0 mL) and equally distributed according to the macroscopic feature. Among them, 23 (63.9%) were not adequate for final diagnosis.

Conclusion: Our results show that adenocarcinoma is a less frequent diagnosis in non-hemorrhagic pleural effusions opposite to mesothelioma. Coagulated-hemorrhagic pleural effusions proved

inadequate for cytomorphological final diagnosis. Pleural effusions without optimal volume also proved inadequate regardless of macroscopic feature. The macroscopic feature of pleural effusions did not affect the immunocytochemistry results. The presented results are in accordance with the literature.