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Title: Cytology and DNA ploidy techniques in the diagnosis of malignant pleural effusion

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Body: Introduction Pleural fluid (PF) cytology is the first approach to diagnose malignant pleural effusion (MPE). Its sensitivity ranges from 40 to 80% and depends on the quality of slide preparation, histological tumor type and the cytologist's skill to differentiate tumor cells from benign reactive mesothelium. Ancillary methods are often required to improve the cytological diagnosis. Objectives To evaluate the sensitivity and specificity of conventional cytology, and the contribution of fluorescence in situ hybridization (FISH) and DNA ploidy in MPE diagnosis. Materials and Methods PF samples from 85 patients were analyzed by cytology and classified as: malignant (presence of malignant cells; n= 45; 52.9%); suspicious (presence of atypical cells; n=16; 18.8%) or benign (no malignant or atypical cells; n= 24; 28.3%). FISH was performed in the 85 PF samples by the alpha centromeric probes for chromosomes 11 (red) and 17 (green) and classified as normal or aneuploid according to the cut-off previously established. In 43 samples we also performed DNA ploidy by flow cytometry (FC). Patient's records were consulted for definitive diagnosis. Results:

Method	Sensitivity (%)	Specificity (%)	Accuracy (%)
Cytology	93.2	80.7	89.4
FISH	94.8	96.1	94.2
DNA ploidy	59.5	33.3	55.8

Conclusion FISH improved the cytological diagnosis of MPE. In five cases of suspicious and in three cases of negative cytology, the presence of aneuploidy cells reclassified the cases as MPE. In these cases, all patients were confirmed with cancer. CF DNA ploidy showed weak diagnostic performance. We recommend associate FISH to cytology mainly for patients with previous diagnosis of cancer who develop pleural

effusion with suspicious cytology.