00672 CYTOLOGY SPECIMENS VS BIOPSY ARE MORE THAN ADEQUATE FOR EGFR MUTATION ANALYSIS

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Background: Testing for Epidermal Growth Factor Receptor (EGFR) mutations is an important step in the evaluation of patients with advanced non-squamous, non-small cell lung cancer given the effectiveness of EGFR tyrosine kinase inhibitors in patients with such mutations. Tumor tissue samples can be obtained from a variety of tissue sites using different sampling modalities. Selection of the optimal biopsy procedure for a given patient should include consideration of adequacy of specimens for such testing. Minimally invasive procedures often result in smaller sized tissue samples and could potentially affect the ability to detect EGFR mutations. We aimed to identify sampling factors associated with EGFR mutation positivity.

Methods: We performed a retrospective analysis of a regional database (Alberta, Canada) of all EGFR mutation testing from January to June 2012 for lung cancer. The Calgary Laboratory Services database, the regional testing facility, was cross-referenced with electronic patient records to identify biopsy site and procurement method. Test positivity was used as a surrogate for specimen adequacy. Tissue samples were analyzed with a PCR mutation assay (Qiagen) for 28 known mutations.

Results: All samples had positive histology or cytology for non-squamous, non-small cell lung carcinoma. A total of 289 biopsy samples were tested, with 77 tests on out of province patients excluded leaving 212 analyzed for this study. Overall EGFR mutation positivity rate was 16%. Although biopsy samples were obtained from various metastatic sites, there was no significant predilection for specific site positivity. EGFR mutation positivity according to biopsy method was as follows: resection or mediastinoscopy (3/32, 9.4%), CT guided or superficial aspirates (9/69, 13%); Endobronchial Ultrasound Transbronchial Needle Aspiration (EBUS: 13/57, 22.8%); Pleural/pericardial fluid (5/13, 38.5%), (chi-square for differences between groups p=0.058).

Conclusion: Using test positivity as a surrogate marker of specimen adequacy, cytologic preparations appear at least as good as surgical specimens, with EBUS and fluid specimens demonstrating highest positivity rates. Minimally-invasive tissue acquisition techniques such as EBUS-TBNA and fluid aspiration are suitable for EGFR mutation analysis in lung cancer.

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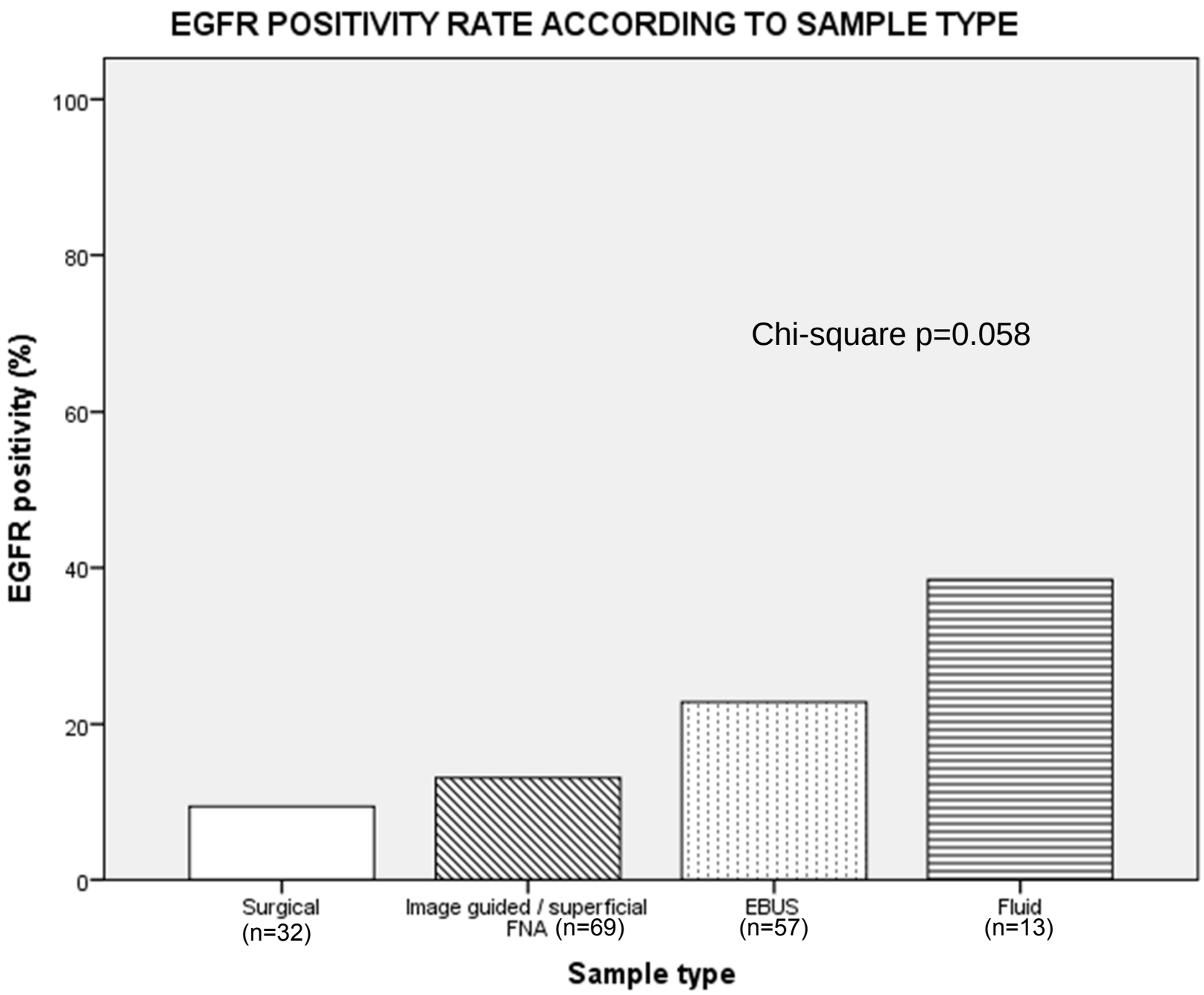
EGFR POSITIVITY RATE ACCORDING TO SAMPLE TYPE
EGFR positivity (%)
100
80
60
40
20
0
Chi-square p=0.058
Surgical (n=32)
Image guided / superficial FNA (n=69)
EBUS (n=57)
Fluid (n=13)
Sample type