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Diagnostic Utility of Touch Imprint Cytology of Surgical Margin of Bile Duct on Frozen Section

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Frozen section is one of the modalities used to determine the surgical margin and the surgical approach for tumor resection. Microscopic ductal spread is not uncommon in the biliary tract cancers without mass-forming and clear resection margin is crucial for long-term survival. However, microscopic invasion of bile duct is difficult to evaluate on frozen section because of well differentiated histology, inflammatory reaction, and freezing artifact. We tried to evaluate the diagnostic utility of simultaneous touch imprint cytology of surgical margin of bile duct during hepatobiliary and pancreatic surgery. A total of 55 cases from 35 patients with cancers originated from intra- and extrahepatic bile duct(5+17), pancreas(6), and ampulla of Vater(7) were enrolled. Four touch imprint cytology slides per case were prepared for 2 H-E and 2 Diff-Quik stains before frozen section of bile duct. Cytology preparation was adequate in 69.1%(38/55). The cytologic diagnosis was categorized as benign, suggestive of malignancy, and malignancy. Inadequate hypocellular preparation was resulted from drying and heat coagulation. The diagnosis of touch imprint and frozen section were matched in 87.3%(48/55). These results were correlated with the permanent section diagnosis. The sensitivity, specificity, false positive rate, and false negative rate were 95.2%(20/21), 94.1%(32/34), 5.9%(2/34), and 4.8%(1/21) in touch imprint cytology and 85.7%(18/21), 97.1%(33/34), 2.9%(1/34), and 14.3%(3/21) in frozen section. The sensitivity was increased upto 100%(21/21) with no false negative case if both methods were applied, however, specificity was rather decreased to 91.2%(31/24) with higher false positive rate of 8.8%(3/34). The cause of false positive cases was floating clusters of atypical cells within bile or fibrinous exudate. In conclusion, adequate preparation of touch imprint cytology is essential and it is more valuable in case of negative results with frozen section