AB014. S014. Fractional uptake of circulating tumor cells across liver-lung compartments during resections of periampullary cancer aimed at cure

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Background: Circulating tumor cells (CTCs) are prognostic for outcome in breast, colon, and prostate cancer and seem to represent promising biomarkers of pancreatic carcinoma as well. The aim of the present study was to demonstrate a statistically significant portal-arterial difference of CTC during resection of periampullary cancer aimed at cure in a limited number of patients.

Methods: A commercially available instrument (Isoflux®) was used to quantify blood content of CTC in ten patients with periampullary cancer according to preoperative diagnostics. Portal and arterial blood (each 8–10 mL) were simultaneously collected intra-operatively after surgical dissection before division of the pancreas for tumor removal. Quantitative CTC analyses were performed according to standardized protocols for immune-magnetic enrichment of CTC. Flow cytometry was applied for qualitative evaluations of various CTC markers in seven patients.

Results: There was a statistically significant difference in numbers of CTC collected in portal blood [58±43 cells per 100 mL, (±SD)] versus arterial blood (24±22 cells per 100 mL, $P<0.025$). A fractional uptake at 40% across liver and lung compartments of assumed malignant CTC was estimated to correspond to the appearance of approximately 400 tumor cells per minute during pancreatic resections based on estimated hepatic blood flow, measured tumor cell mass and tumor cell proliferation activity. Complications to collection of portal blood were not observed.

Conclusions: A significant uptake across liver or lung compartments of potentially malignant CTCs from periampullary carcinoma may represent a model to capture, define and characterize cell clones with high metastatic potential in liver and lung tissues following surgical resections.

doi: 10.21037/apc.2018.AB014

Cite this abstract as: Engström C, Vilhav C, Naredi P, Bourghardt-Fagman J, Iresjö BM, Lundholm K. Fractional uptake of circulating tumor cells across liver-lung compartments during resections of periampullary cancer aimed at cure. Ann Pancreat Cancer 2018;1:AB014. doi: 10.21037/apc.2018.AB014