

Congress Abstract

Comparison of the Sensitivity of CT-Arteriohepaticography and Intravenous Contrast-Enhanced CT in Colorectal Cancer Liver Metastases After Neoadjuvant Chemotherapy

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Introduction: The main method for preoperative assessment of colorectal cancer (CRC) liver metastases remains intravenous contrast-enhanced computed tomography (CT); however, its sensitivity is limited, especially for lesions smaller than 10 mm, and neoadjuvant chemotherapy further reduces it. The characteristic CT appearance of a metastasis is hypodensity in the portal phase and a rim of enhancement at the lesion edge, which can be enhanced by injecting contrast material directly into the hepatic arteries. CT-arteriohepaticography (CT-AHG) is potentially more effective, including during drug treatment, but data on its sensitivity after chemotherapy are virtually absent.

Objective: To compare the diagnostic efficacy of CT-AHG and intravenous contrast-enhanced CT in the detection and characterization of CRC liver metastases in patients after neoadjuvant chemotherapy.

Materials and Methods: This single-center prospective study included 22 patients with CRC and liver metastases who underwent both imaging methods prior to liver resection at the N.N. Petrov National Medical Research Center of Oncology. The unit of analysis was the lesion. The reference standard was targeted histological examination of each resected lesion. CT and CT-AHG were evaluated independently, using animated images, by radiologists with more than 5 years of experience, one for each "patient-method" pair. For each method, sensitivity, specificity, and predictive values with 95% Clopper-Pearson confidence intervals (CIs) were calculated for 129 included lesions. The difference in sensitivities was reported with 95% CI (patient-level bootstrap) and tested using McNemar's exact test.

Results: With combined use of CT and CT-AHG (a lesion was considered positive if detected by at least one method), sensitivity was 80.8% [72.6–87.4], which was 10.0 percentage points (95% CI: +2.4 to +17.9) higher than the sensitivity of CT alone. Individually, sensitivity was 70.8% [61.8–78.8] for CT and 73.3% [64.5–81.0] for CT-AHG. The difference between them was –2.5 percentage points (95% CI: –9.5 to +6.8) and was not statistically significant ($p = 0.66$). For lesions smaller than 10 mm, sensitivity was 35.3% for CT versus 50.0% for CT-AHG; for lesions 10 mm or larger, sensitivity was 84.9% and 82.6%, respectively.

Conclusion: The sensitivity of CT-AHG does not differ significantly from that of intravenous contrast-enhanced CT; however, the combination of methods improves sensitivity by 10.0 percentage points. Therefore, CT-AHG should be considered as a complement to CT, rather than a replacement for it.

Keywords: Colorectal Cancer; Liver Metastases; CT-Arteriohepaticography; Intravenous Contrast-Enhanced CT
