Appendix 1

Investigators

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Methods-DLCT protocol

All patients underwent bowel preparation before the scan. Contrast-enhanced abdominal scans were performed using a DLCT device (IQon spectral CT, Philips Healthcare, Amsterdam, the Netherlands) in the craniocaudal supine position. The scanning protocol was as follows: tube voltage, 120 kV; tube current, smart milliampere-seconds; rotation time, 0.5 s; detector collimation, 64×0.625 mm; field of view, 350×350 mm; matrix, 512×512; layer thickness, 5 mm; and reconstruction thickness, 1.25 mm. Patients were intravenously injected with nonionic contrast media (ioversol, 350 mgI/mL) at a dose of 1.5 mL/kg and at an injection rate of 3.5 mL/s via a high-pressure automatic injector, and then 30 mL of saline was then pumped at the same rate. Arterial phase (AP) and portal venous phase (PVP) were performed 10 and 35 s after the predetermined threshold of 150 Hounsfield unit (HU) within the aorta descendens (activated bolus tracking), respectively.

All DLCT images were uploaded to the picture archiving and communication system and the multiparameter analysis of the spectral base images was performed with the IntelliSpace Portal, V10 workstation (Philips Healthcare) for further examination.

Methods-matching of the LN stations in the targeted region and quantitative parameter measurements

The matching of the imaging regional LN stations to the pathological ones was completed by two radiologists to determine if the targeted regional LN stations were composed of all metastatic or all nonmetastatic LNs. In case of disagreement, the two radiologists reached an agreement through consultation and discussion. (II) The measurements of the DLCT quantitative parameters and L/S were executed by another two radiologists who were only aware of the targeted regional LN stations and not the metastatic status of the targeted regional LNs. The DLCT quantitative parameters including iodine concentration (IC), effective atomic number (Zeff), and the slope of the spectral attenuation curves (λHU) were obtained from the iodine map, Zeff map, and virtual monoenergetic image (VMI), respectively, both in the AP and PVP. IC and Zeff were standardized into normalized iodine concentration (NIC) and normalized effective atomic number (NZeff) in order to minimize the hemodynamic effects in patients. NIC, Zeff, and λHU were respectively calculated as follows: NIC = ICLN/ICaorta; NZeff = ZeffLN/Zeffaorta (33) λHU = (HU40keV–HU100keV)/(100–40). [The spectral curve shows greater stability when the energy level below 100 keV (34)]. The L/S was evaluated at 40keV on VMI in PVP (PVP40keV). The region of interest (ROI) was placed on the parenchymal area of the targeted regional LN. To reduce the deviation, all of the above-mentioned measurements were performed two times, with the average of the two values being used as the final value.

References

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Table S1 Intraclass correlation coefficient for the measurements of DLCT quantitative parameters and L/S

Variable	ICC	95% CI
APIC	0.966	0.953–0.975
APNIC	0.957	0.942–0.968
APZeff	0.947	0.928–0.960
APNZeff	0.934	0.902–0.954
APλHU	0.929	0.898–0.950
PVPIC	0.956	0.940–0.968
PVPZeff	0.924	0.898–0.944
PVPλHU	0.915	0.886–0.938
L/S	0.901	0.867–0.927

DLCT, dual-layer detector spectral computed tomography; L/S, nodal ratio of the longest axis to the shortest axis; ICC, intraclass correlation coefficient; CI, confidence interval; APIC, iodine concentration in the arterial phase; APNIC, normalized iodine concentration in the arterial phase; APZeff, effective atomic number in the arterial phase; APNZeff, normalized effective atomic number in the arterial phase; APλHU, slope of the spectral attenuation curves in the arterial phase; PVPIC, iodine concentration in the portal venous phase; PVPZeff, effective atomic number in the portal venous phase; PVPλHU, slope of the spectral attenuation curves in the portal venous phase.

Table S2 P value of the DeLong test for the AUCs of 9 different quantitative parameters

Variable	APIC	APNIC	APZeff	APNZeff	APλHU	PVPIC	PVPZeff	PVPλHU	L/S
APIC (AUC =0.852)	–	0.83	0.06	0.008*	0.02*	<0.001*	<0.001*	<0.001*	0.03*
APNIC (AUC =0.849)	0.83	–	0.38	<0.001*	0.72	<0.001*	<0.001*	<0.001*	0.03*
APZeff (AUC =0.834)	0.06	0.38	–	0.03*	0.37	<0.001*	<0.001*	<0.001*	0.07
APNZeff (AUC =0.765)	0.008*	<0.001*	0.03*	–	0.02*	0.08	0.07	0.049*	0.68
APλHU (AUC =0.843)	0.02*	0.72	0.37	0.02*	–	<0.001*	<0.001*	<0.001*	0.04*
PVPIC (AUC =0.673)	<0.001*	<0.001*	<0.001*	0.08	<0.001*	–	0.47	0.20	0.28
PVPZeff (AUC =0.666)	<0.001*	<0.001*	<0.001*	0.07	<0.001*	0.47	–	0.40	0.23
PVPλHU (AUC =0.659)	<0.001*	<0.001*	<0.001*	0.049*	<0.001*	0.20	0.40	–	0.19
L/S (AUC =0.741)	0.03*	0.03*	0.07	0.68	0.04*	0.28	0.23	0.19	–

*, P value <0.05. AUC, area under the curve; APIC, iodine concentration in the arterial phase; APNIC, normalized iodine concentration in the arterial phase; APZeff, effective atomic number in the arterial phase; APNZeff, normalized effective atomic number in the arterial phase; APλHU, slope of the spectral attenuation curves in the arterial phase; AUC, area under the curve; PVPIC, iodine concentration in the portal venous phase; PVPZeff, effective atomic number in the portal venous phase; PVPλHU, slope of the spectral attenuation curves in the portal venous phase; L/S, nodal ratio of the longest axis to the shortest axis.

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Table S3 P value of the DeLong test for the AUCs of 8 different combinations

Variable	APIC + L/S	APNIC + L/S	APZeff + L/S	APNZeff + L/S	APλHU + L/S	PVPIC + L/S	PVPZeff + L/S	PVPλHU + L/S
APIC + L/S (AUC =0.876)	–	0.90	0.15	0.02*	0.04*	<0.001*	<0.001*	<0.001*
APNIC + L/S (AUC =0.878)	0.90	–	0.30	<0.001*	0.40	<0.001*	<0.001*	<0.001*
APZeff + L/S (AUC =0.866)	0.15	0.30	–	0.03*	0.92	0.001*	0.001*	<0.001*
APNZeff + L/S (AUC =0.815)	0.02*	<0.001*	0.03*	–	0.04*	0.16	0.18	0.09
APλHU + L/S (AUC =0.867)	0.04*	0.40	0.92	0.04*	–	0.001*	0.001*	<0.001*
PVPIC + L/S (AUC =0.770)	<0.001*	<0.001*	0.001*	0.16	0.001*	–	0.68	0.55
PVPZeff + L/S (AUC =0.772)	<0.001*	<0.001*	0.001*	0.18	0.001*	0.68	–	0.36
PVPλHU + L/S (AUC =0.763)	<0.001*	<0.001*	<0.001*	0.09	<0.001*	0.55	0.36	–

*, P value <0.05. AUC, area under the curve; APIC, iodine concentration in the arterial phase; L/S, nodal ratio of the longest axis to the shortest axis; APNIC, normalized iodine concentration in the arterial phase; APZeff, effective atomic number in the arterial phase; APNZeff, normalized effective atomic number in the arterial phase; APλHU, slope of the spectral attenuation curves in the arterial phase; AUC, area under the curve; PVPIC, iodine concentration in the portal venous phase; PVPZeff, effective atomic number in the portal venous phase; PVPλHU, slope of the spectral attenuation curves in the portal venous phase.

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