Letter to the Editor

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RE: Aberrant Vascular Structures and Its Effect on the Adjacent Organs: How Can We Evaluate Efficiently and Safely?

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To the Editors:

We have read the recent article by Lee et al. (1) with great interests. They reported multidetector computed tomography (MDCT), magnetic resonance cholangiopancreatography (MRCP) and endoscopic retrograde cholangiopancreatography (ERCP) findings of a unique case of a patient who presented incidentally-detected main pancreatic duct dilatation that was caused by the intrapancreatic-replaced common hepatic artery. In their report, they also emphasized that other organs such as esophagus, duodenum, common bile duct, or ureters can be compressed by aberrant origins or unusual course blood vessels, causing symptoms like dysphagia, jaundice, or hydronephrosis. Due to our special interest in the anatomical variation of the vessels and radiologic evaluation method of the unusual or aberrant vascular structures and its effects on the adjacent organs (2-6), we would like to contribute regarding the non-invasive and ionizing radiation free radiological imaging methods in the evaluation of the aberrant origins and/or unusual course vascular structures and its effect on the adjacent organs.

Multidetector computed tomography angiography permits an accurate and detailed analysis of normal vascular anatomy and its variations. If vascular structures and adjacent organs have spontaneous contrast differences, it is easy to determine the relationship between these structures. However, in some cases, the simultaneous visualization of aberrant vascular structures and its effects on the adjacent organs may require more sophisticated imaging strategies. The contrast enhancement of the aberrant vascular structures and adjacent organs may be provided by single acquisition with two different contrasting administrations such as detection of the superior mesenteric artery syndrome or single acquisition with biphasic administrations of the same contrast material. Kocaoglu et al. (6) presented MDCT urography findings of bilateral retroiliac ureters with a biphasic intravenous (IV) contrast material injections and single acquisition method used to visualize the ureters and iliac arteries simultaneously. They first used the first half dose of IV contrast material, and after a 30-minute interval for contrast excretion, the second half was used immediately before the CT. This method can be used sufficiently to determine compression effects on the ureter of aberrant and/or abnormal course renal or other visceral arterial and venous structures. If patient is suitable and has not a contraindication, similar methods can be used in the contrast enhanced MR urography without ionizing radiation exposures.

The relationship between the aberrant origins and/or course vascular structures and biliary-pancreatic canals are extremely rare as described by the author. The association between these two structures can be determined through the combination of the ultrasonography (US), MDCT angiography, MR and ERCP. However, the main concern with MDCT is the increased risk of substantial radiation exposures to patients. ERCP is an invasive technique and also contains ionizing radiation. The US is an operator-dependent technique and its role is limited in the main biliary ducts and pancreatic canals due to the interposition of air-containing intestinal structures. Conventional MR imaging and MRCP can be successful in the evaluation of sufficiently enlarged biliary system and pancreatic duct. In

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some cases, the biphasic IV contrast material injection and single acquisition MR imaging method can be more useful to visualize the biliary system and aberrant overriding arteries simultaneously. In this technique, initially, the first dose of high T1 relaxivity liver-specific contrast agents such as gadobenate dimeglumine (Gd-BOPTA) is administrated, and after a 60-minute delay for contrast excretion into the biliary tree, the second dose is used in the MR examination which contains MR angiographic sequences. This method can be used efficiently to determine the relationships between the aberrant vascular structures and biliary tree, non-invasively and without radiation exposures. However, the selection of patient is very important for this technique because of the possible contraindications of the MR scanning and possible risks of nephrogenic systemic fibrosis due to the uses of more contrast materials than the usual MR examination in patients with renal impairments.

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