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Title: Role of Contrast-Enhanced Intraoperative Ultrasonic Cholangiography in Living Donor Hepatectomy
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Body: Introduction: Recently, we have established a novel intraoperative cholangiography (IOC) technique, contrast-enhanced intraoperative ultrasonic cholangiography (CE-IOUSC) as a tool for real-time biliary navigation in hepatobiliary surgery[1][2]. In this video, we demonstrate the usefulness of CE-IOUSC compared with radiographic IOC in living donor hepatectomy (LDH). Materials and Methods: CE-IOUSC was performed using an ultrasound imaging system with a 4D probe, a T-shaped linear probe and a micro-convex probe (Toshiba Medical Systems). After temporary clamping of the common bile duct, ultrasound contrast agent Sonazoid (perfluorobutane) diluted thousand fold was injected via a 4Fr transcystic catheter. CE-IOUSC was performed followed by radiographic IOC before hepatectomy, before bile duct division, and after procurement of the graft. We describe the case of a 29-year-old woman who was scheduled to undergo extended left hepatectomy as donor using CE-IOUSC and radiographic IOC. Results: 3D CE-IOUSC could detect accurate biliary configuration as well as radiographic IOC. 2D CE-IOUSC could help us to determine an optimal cutting point of the hepatic duct at the hepatic hilum. In addition, 2D CE-IOUSC on the cut surface showed the patency of the hepatic duct in the remnant liver without biliary stricture. The postoperative course was uneventful in the donor and the recipient. Discussion: CE-IOUSC can facilitate the surgeon's understanding of the biliary configurations with 3D mapping and 2D regional anatomy of biliary tree to reduce the potential risk of bile duct injury. In particular, 2D-CEIOUSC can facilitate understanding the spatial relationships between bile ducts and liver parenchyma simultaneously as opposed to radiographic IOC. CE-IOUSC is relatively safe without radiation exposure. Conclusions: CE-IOUSC is a novel IOC technique that provides excellent visualization of the biliary tree for LDH. This biliary navigation technique facilitates identification of the biliary system, guidance for bile duct division and confirmation of the remnant biliary system.