

**M-AS 4****The usefulness of ICG fluorescence cholangiography during laparoscopic cholecystectomy**

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Laparoscopic cholecystectomy (LC) is one of the most frequently performed gastrointestinal surgery. Bile duct injury (BDI) is one of the most serious complications of LC with incidence reported at 0.3-0.7%, often due to misinterpretation of biliary anatomy. While anatomical mapping of biliary anatomy with intraoperative cholangiogram (IOC) performed with LC showed reduction of BDI in some studies, an alternative method of biliary mapping using fluorescence cholangiography, has been increasingly used.

Near infra-red ray excitation of Indocyanine green (ICG) excreted in bile produced fluorescence cholangiography (ICG-FC). In comparison to IOC, ICG-FC is reported to have higher common hepatic duct visualisation. Though not statistically significant, it also showed higher visualisation rate of cystic duct (CD), common bile duct (CBD) and CD-CBD junction visualisation. In addition, ICG-FC is reported to be safe to perform, had shorter operative time and lower median cost in comparison to IOC when performed with LC. ICG-FC is also showed to aid young surgeons in better identification of biliary anatomy. It may also potentially shorten the surgical time to achieve CVS in difficult cholecystectomy.

Limitation in ICG-FC are related to its 5-10mm tissue penetration property. There is reduced identification of CD before dissection, although there is no difference in HD, CBD or accessory duct identification. A supplementary intra-operative laparoscopic ultrasound (IOUS) is also recommended should identification of CBD stone is indicated as ICG-FC are not suitable in identifying biliary stones.

The use of ICG-FC is currently conditionally recommended or recommended to be performed with LC in some guidelines. Large scale multi-center studies are needed to conclude whether ICG-FC has advantages over conventional IOC.