

Understanding Intraoperative Fluorescent Cholangiography: 10 Steps for an Effective and Successful Procedure

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BACKGROUND

The rate of bile duct injuries (BDI) during laparoscopic cholecystectomy (LC) has not decreased throughout the years. BDI is mostly due to the misidentification of the extra-hepatic bile duct structures and the anatomic variability,. Near-infrared fluorescent cholangiography (NIFC) is a promising tool that enhances visualization of extra-hepatic biliary structures during LCs. The purpose of this study is to describe the most important steps in the performance, adoption, execution and implementation of NIFC.

METHODS

In accordance to the surgical practice of LC in a single single-institution, a consensus was achieved by the performing surgeons on the most relevant steps during this procedure guided by fluorescent cholangiography. Steps from the SAGES expert Delphi consensus were integrated in the NIFC techniques. Dose of indocyanine green (ICG), time of administration, and identification of structures, were previously determined based on prospective and randomized controlled studies performed at this center.

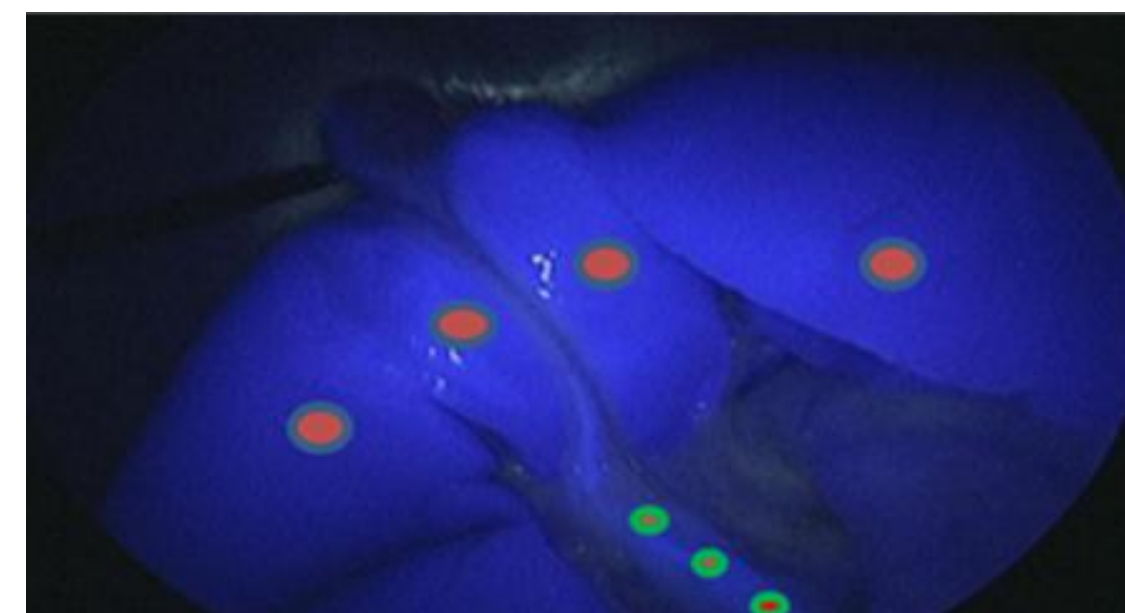


Fig 1. Intensity of NIR light

RESULTS

Ten steps were determined for the appropriate performance of NIFC during LC. The steps were divided into the following: Administration of ICG, exposure of the hepato-duodenal ligament, initial anatomical evaluation, identification of the cystic duct and common bile duct junction, identification of the cystic duct and its junction to the gallbladder, identification of the common hepatic duct, identification of accessory ducts, identification of the cystic artery and performance of arteriography, time-out and identification of Calot's triangle, and evaluation of the liver bed.

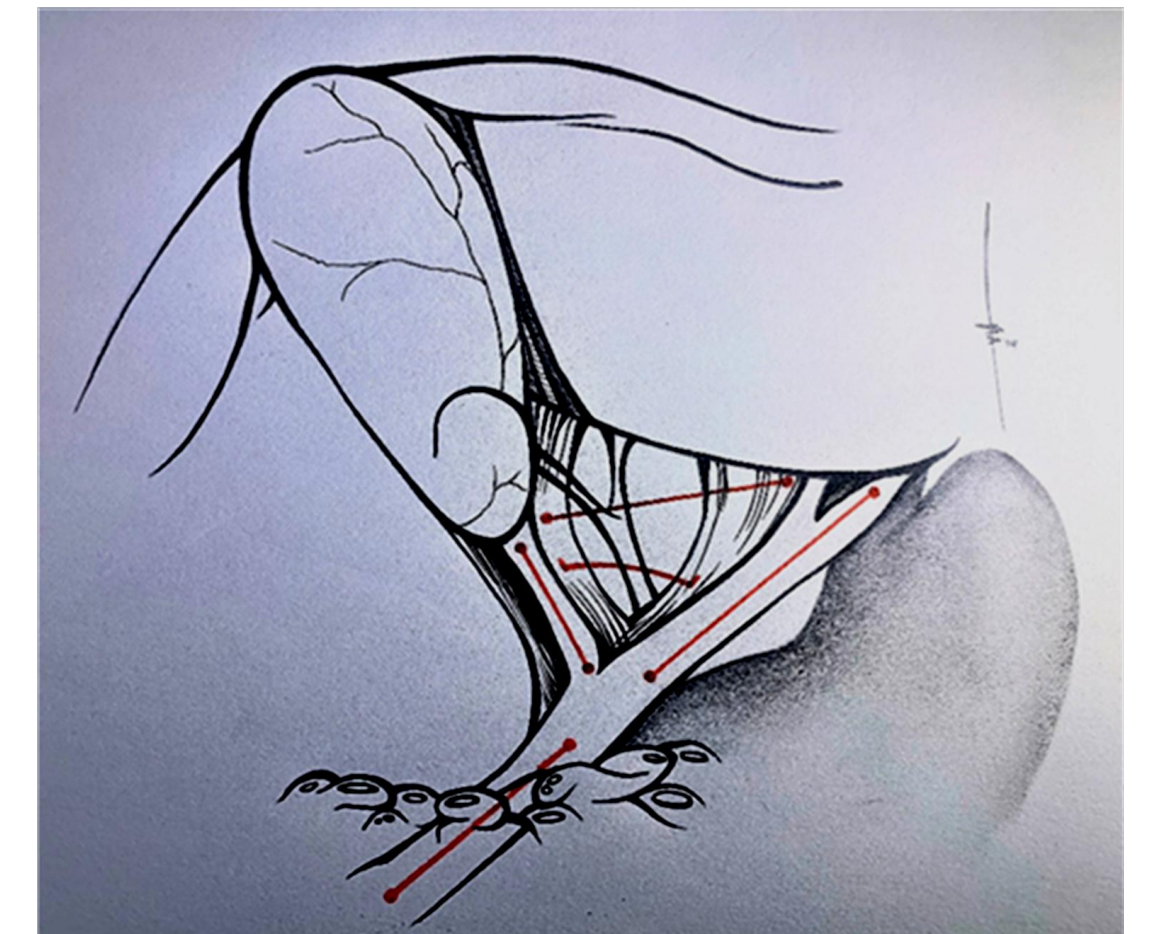


Fig 2. Calot's Triangle measurements under critical view of safety

CONCLUSIONS

The use of NIFC is useful to better visualize the extra-hepatic biliary structures during LC. The use of specific standardized steps might provide the surgeon with a better tool to use this technology and reducing BDI. Future directives should focus on the standardization of time of administration, optimal dose, and tissue-specific quantification of captured fluorescent light.