Fluorescence-guided surgery (FGS) using Indocyanine Green (ICG) is a dynamic innovation - providing real-time intraoperative imaging & assessment, addressing the limitation of tactile feedback in laparoscopy and ultimately, decreasing possible morbidities with improved visualization in surgery. In biliary surgery, misidentification is the leading cause of bile duct injury. A study done by Way, et al. noted that the primary cause of error in 97% of cases was visual perceptual illusion. In liver resection, vascular identification is important. With FGS, these are being addressed, at the same time, providing an adjunct tool for the safe surgery our patients. FGS has been shown to improve visualization & assessment, addressing the limitation of tactile feedback in laparoscopy & ultimately, decreasing possible morbidities.

FGS may be used in acute & chronic cases. Pre-dissection, anatomy may be appreciated already. In acute cases & adhesions, fluorescence may be appreciated after some degree of dissection or <10mm tissue thickness. Repetitive ICG administration may also be done as necessary.

ICG Systems Used: Olympus Visera, Stryker, Karl Storz, Novadaq Pinpoint & i-SPY (for open surgery). ICG was administered at different dosages & timing, depending on the contemplated procedure and the liver status of the patient.

For elective cholecystectomies, the authors of this paper observed a good contrast ratio of liver to biliary structures 6 hours pre-operatively. For emergent cases, ICG may be administered at least 15 minutes prior to surgery. For liver cases, pre-operative ICG administration (POIA) at 3-7 days was done. For all HPB cases, intra-operative ICG administration (IOIA) may be done for vascular angiography and organ perfusion assessment. In some cases, repetitive ICG administration of ICG was done, taking into consideration the maximum dose that can be given to the patient.

Use of ICG in hepato-pancreatico-biliary surgery is simple, safe and significant. It is one of the few fluorescence imaging techniques that have reached clinical application in oncology. Knowing what you want to see is of key. With continuous studies, innovations & finding solutions for its limitations, FGS might become a standard of practice in the future for hepatobiliary surgery.