



# The use of ICG to enhance operative safety in emergency laparoscopic cholecystectomy. Experience from the General Hospital of Aigio



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## Introduction

Indocyanine Green fluorescence (ICG) is a well-recognized technique that provides an intraoperative mapping of the biliary system. This study aimed to investigate the results of laparoscopic cholecystectomy using ICG.

## Methods

This is a cross-sectional study of patients with laparoscopic cholecystectomy using real-time fluorescent ICG to treat gallbladder disease from January 2021 to September 2025 in the General Hospital of Aigio.

## Results

31 patients underwent laparoscopic cholecystectomy using intraoperative ICG fluorescence for bile duct visualization. The mean age of the patients was  $59.1 \pm 16.9$ , and the male/female ratio was 1.48. Chronic cholecystitis caused by stones accounted for the majority (51%). We detected 6.5% of cases with anatomical changes of the extrahepatic biliary tract using ICG fluorescence, and clearly identifying the anatomy of the common bile duct and the cystic duct was 100% and 96.8%, respectively. The average surgical time was  $55.8 \pm 29.6$  minutes. There were no post-operative complications or side effects of ICG, the average hospital stay was  $2.9 \pm 2.3$  days.



## Discussion

In a laparoscopic cholecystectomy (LC), ICG fluorescence is an emerging technique to help the surgeon see critical anatomical landmarks such as the cystic artery, cystic duct, common hepatic duct, CBD, and bile duct. Understanding the extrahepatic biliary tract's anomalies can assist in minimizing the damage done to it. ICG is known to be excreted in bile; hence, the extrahepatic biliary tract can be seen by ICG fluorescence imaging. However, the limitation of this approach is that ICG fluorescence cannot be seen when the tissue is thicker than 1 cm. It can be challenging to see the ICG fluorescence in acute cholecystitis caused by stones because of edema and severe inflammation of the tissues surrounding the gallbladder, the cystic duct, and the hepatic pedicle.

## Conclusion

ICG fluorescence cholangiography allows surgeons to easily identify critical anatomical landmarks in laparoscopic cholecystectomy. Thereby helps the surgery to be performed safely, avoiding severe complications due to damage to the biliary tract.