

## Standardization of surgical techniques for cholangiocarcinoma based on Laennec's capsule

Atsushi Sugioka, Yutaro Kato, Yoshinao Tanahashi, Tadashi Kagawa, Gozo Kiguchi, Masayuki Kojima, Akira Yasuda, Sanae Nakajima, Syo-ichiro Tsuji, Zenichi Morise, Ichiro Uyama

Department of Surgery, Fujita Health University, Aichi, Japan

**BACKGROUND:** Perihilar cholangiocarcinoma is the cancer invading along the plate system and affecting the adjacent structures. Therefore, the en-bloc resection with non-touch isolation technique to the plate system is desirable in theory. However, the procedure is not standardized because of both anatomical complexity and technical difficulties. We proposed the novel comprehensive anatomy of the liver based on Laennec's capsule that enabled us to isolate the extrahepatic Glissonean pedicle without parenchymal destruction. We applied this concept to advanced perihilar cholangiocarcinoma as the intact pedicle-first approach to standardize the surgical procedure of en-bloc resection with non-touch isolation technique.

**SURGICAL TECHNIQUES:** For the left-side dominant case, left trisectionectomy with total caudate lobectomy combined with both the portal and arterial reconstruction was indicated. First, the root of the extrahepatic posterior pedicle was isolated and individual vessels were isolated. Demarcation line was confirmed and parenchymal dissection in the cranio-caudal direction was carried out from the root of the RHV. Finally, en-bloc resection with both the portal and arterial reconstruction was completed. On the other hand, for the right-side dominant case, right trisectionectomy or extended right hemihepatectomy with total caudate lobectomy combined with or without the portal and arterial reconstruction was indicated. First, the root of the umbilical pedicle (G2+3+4) or the lateral pedicle (G2+3) was isolated according to the extent of horizontal cancer invasion. Then, the Spiegel pedicle (G1L) was isolated. In the case of portal reconstruction, the left portal vein should be transected distally to the confluence of the Arantius duct, whereas preservation, the Spiegel vessels should be divided for the en-bloc resection of the caudate lobe. We carried out resection with the novel concept for 33cases of advanced perihilar cholangiocarcinoma under the novel concept with

10-year survival rate 31%.

**CONCLUSION:** The novel concept of the liver anatomy based on Laennec's capsule standardizes the surgical procedure of en-bloc resection with non-touch isolation technique for advanced perihilar cholangiocarcinoma.