



Laparoscopic Radical Resection After Neoadjuvant Therapy for Intrahepatic Cholangiocarcinoma with Hepatic Hilus Involvement

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ABSTRACT

Background. Intrahepatic cholangiocarcinoma (ICCA) with hepatic hilus involvement is a more aggressive type of cholangiocarcinoma with worse outcomes.^{1,2} Surgical resection with negative margins is the only effective treatment for ICCA.^{3,4} Neoadjuvant therapy is considered to improve the possibility of surgery for patients;^{5,6} however, laparoscopic radical resection after neoadjuvant therapy for ICCA with hepatic hilus involvement remains at the exploratory stage due to technical challenges.⁷

Methods. A 19-year-old man presented with an ICCA on the left side of the liver invading the blood vessels and bile ducts in the hepatic hilum. Five courses of neoadjuvant therapy were administered after a multidisciplinary team determined that the tumor was extremely difficult and risky to operate on. A laparoscopic left hepatectomy plus caudal lobectomy was performed to complete the resection of the negative margins. Three-dimensional visualization enabled precise preoperative planning and intraoperative guidance, including visualization of the tumor location, simulation of bile duct and vessel dissection steps, as well as determining the extent of liver resection. Vascular skeletonization, lymphadenectomy and biliary reconstruction were performed during operation.

Results. The operation time was 415 min with a blood loss of 100 mL. Postoperative pathohistology confirmed cholangiocarcinoma with low to intermediate differentiation. The resection margin was negative (R0) and lymph node pathology was tumor-negative (0/10). The patient was discharged on postoperative day 10 without complications.

Conclusion. Laparoscopic radical resection after neoadjuvant therapy for ICCA with hepatic hilus involvement is safe and feasible in a large-throughput hepatic surgery center.

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REFERENCES

1. Zhang XF, Bagante F, Chen Q, et al. Perioperative and long-term outcome of intrahepatic cholangiocarcinoma involving the hepatic hilus after curative-intent resection: comparison with peripheral intrahepatic cholangiocarcinoma and hilar cholangiocarcinoma. *Surgery*. 2018;163(5):1114–20. <https://doi.org/10.1016/j.surg.2018.01.001>.
2. Wei T, Lu J, Xiao XL, et al. Classification of intrahepatic cholangiocarcinoma into perihilar versus peripheral subtype. *Ann Surg Oncol*. 2024;31(2):1232–42. <https://doi.org/10.1245/s10434-023-14502-3>.
3. Alvaro D, Gores GJ, Walicki J, et al. EASL-ILCA Clinical Practice Guidelines on the management of intrahepatic

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- cholangiocarcinoma. *J Hepatol.* 2023;79(1):181–208. <https://doi.org/10.1016/j.jhep.2023.03.010>.
4. Vogel A, Bridgewater J, Edeline J, et al. Biliary tract cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up. *Ann Oncol.* 2023;34(2):127–40. <https://doi.org/10.1016/j.annonc.2022.10.506>.
 5. Akateh C, Ejaz AM, Pawlik TM, Cloyd JM. Neoadjuvant treatment strategies for intrahepatic cholangiocarcinoma. *World J Hepatol.* 2020;12(10):693–708. <https://doi.org/10.4254/wjh.v12.i10.693>.
 6. Sirica AE, Gores GJ, Groopman JD, et al. Intrahepatic cholangiocarcinoma: continuing challenges and translational advances. *Hepatology.* 2019;69(4):1803–15. <https://doi.org/10.1002/hep.30289>.
 7. Sucandy I, Younos A, Lim-Dy A, Ross S, Rosemurgy A. Robotic klatskin type 3A resection with biliary reconstruction: description of surgical technique and outcomes of initial series. *Ann Surg Oncol.* 2023;30(13):8559–60. <https://doi.org/10.1245/s10434-023-14256-y>.
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