

Prognostic significance of regional lymphadenectomy in T1b gallbladder cancer: Results from 24 hospitals in China

Tai Ren, Yong-Sheng Li, Xue-Yi Dang, Yang Li, Zi-Yu Shao, Run-Fa Bao, Yi-Jun Shu, Xu-An Wang, Wen-Guang Wu, Xiang-Song Wu, Mao-Lan Li, Hong Cao, Kun-Hua Wang, Hong-Yu Cai, Chong Jin, Hui-Han Jin, Bo Yang, Xiao-Qing Jiang, Jian-Feng Gu, Yun-Fu Cui, Zai-Yang Zhang, Chun-Fu Zhu, Bei Sun, Chao-Liu Dai, Lin-Hui Zheng, Jing-Yu Cao, Zhe-Wei Fei, Chang-Jun Liu, Bing Li, Jun Liu, Ye-Ben Qian, Yi Wang, Ya-Wei Hua, Xi Zhang, Chang Liu, Wan-Yee Lau, Ying-Bin Liu

Supplementary Table 1 Association between surgery type and overall survival in T1b gallbladder cancer patients, excluding patients who underwent cholecystectomy combined with regional lymphadenectomy and had missing nodal status (Nx)

Variable	HR (95%CI)	P value
Ch + RL <i>vs</i> Ch	0.45 (0.22-0.94)	0.035 ^a
Age > 60 yr	1.56 (0.71-3.42)	0.27
Female sex	0.66 (0.29-1.53)	0.32
High hospital volume	1.09 (0.53-2.26)	0.81
Negative margin	0.32 (0.12-0.87)	0.026 ^a

^a $P < 0.05$. HR: Hazard ratio; Ch + RL: Cholecystectomy combined with regional lymphadenectomy; Ch: Cholecystectomy.

Supplementary Table 2 Association between surgery type and overall survival in T1b gallbladder cancer patients, excluding patients who had a positive resection margin

Variable	HR (95%CI)	<i>P</i> value
Ch + RL <i>vs</i> Ch	0.48 (0.23-0.98)	0.045 ^a
Age > 60 yr	2.06 (0.87-4.84)	0.098
Female sex	0.68 (0.32-1.46)	0.33
High hospital volume	0.81 (0.40-1.67)	0.57

^a*P* < 0.05. HR: Hazard ratio; Ch+RL: Cholecystectomy combined with regional lymphadenectomy; Ch: Cholecystectomy.

Supplementary Table 3 Association between surgery type and overall survival in T1b gallbladder cancer patients, including hepatectomy as a predictor

Variable	HR (95%CI)	P value
Ch + RL <i>vs</i> Ch	0.37 (0.14-1.00)	0.050 ^a
Age > 60 yr	1.89 (0.88-4.08)	0.10
Female sex	0.57 (0.27-1.20)	0.14
High hospital volume	1.02 (0.52-2.02)	0.95
Negative margin	0.31 (0.11-0.84)	0.021 ^a
Hepatectomy	1.55 (0.58-4.14)	0.38

^a $P < 0.05$. Model adjusted for age (≥ 60 yr *vs* <60 yr), sex, hospital volume (high *vs* low), resection margin (positive *vs* negative), and hepatectomy (performed *vs* not performed). HR: Hazard ratio; Ch + RL: Cholecystectomy combined with regional lymphadenectomy; Ch: Cholecystectomy.

Supplementary Table 4 Comparison of the characteristics of T1b gallbladder cancer patients who underwent cholecystectomy alone or cholecystectomy combined with regional lymphadenectomy, stratified by whether hepatectomy was performed

Characteristic	No hepatectomy (<i>n</i> = 23)	Hepatectomy (<i>n</i> = 54)	<i>P</i> value
Age, mean ± SD (yr)	62.1 ± 10.1	61.1 ± 9.2	0.66
Female sex	15 (65.2)	42 (77.8)	0.25
Admitted to high-volume centers ¹	9 (39.1)	22 (40.7)	0.90
Bile duct resection	1 (4.3)	4 (7.4)	1.00
Nodal metastasis status			0.28
Negative (N0)	15 (65.2)	40 (74.1)	
Positive (N+)	1 (4.3)	6 (11.1)	
Undetermined (Nx)	7 (30.4)	8 (14.8)	
No. of examined nodes, median (range)	2 (0-14)	3.5 (0-14)	0.090
Negative resection margin	23 (100)	50 (92.6)	0.31
Poor histological grade	4 (17.4)	11 (20.4)	1.00
Microscopic vascular invasion	0 (0)	3 (5.6)	0.55
Perineural invasion	0 (0)	1 (1.9)	1.00

¹Hospitals admitting more than 20 gallbladder cancer patients *per* year.

Supplementary Appendix 1 The Chinese Research Group of Gallbladder Cancer is a retrospective multicenter cohort. We appreciate the following collaborators involved in this study

Province/city	Hospital	Principal investigator
Shanghai	Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine	Prof. Yingbin Liu
Shaanxi	The First Affiliated Hospital of Xi'an Jiaotong University	Prof. Chang Liu
Shanxi	Shanxi Provincial Cancer Hospital	Prof. Xueyi Dang
Jiangsu	The First People's Hospital of Taicang	Prof. Yi Wang
Anhui	The First Affiliated Hospital of Anhui Medical University	Prof. Yeben Qian
Shandong	Shandong Provincial Hospital	Prof. Jun Liu
Heilongjiang	Harbin Medical University Cancer Hospital	Prof. Bing Li
Hunan	People's Hospital of Hunan Province	Prof. Changjun Liu
Shanghai	Xinhua (Chongming) Hospital Affiliated to Shanghai Jiao Tong University School of Medicine	Prof. Zhewei Fei
Shandong	The Affiliated Hospital of Qingdao University	Prof. Jingyu Cao
Jiangxi	The First Affiliated Hospital of Nanchang University	Prof. Linhui Zheng
Liaoning	Shengjing Hospital of China Medical University	Prof. Chaoliu Dai

Province/city	Hospital	Principal investigator
Heilongjiang	The First Affiliated Hospital of Harbin Medical University	Prof. Bei Sun
Jiangsu	Changzhou No. 2 People's Hospital	Prof. Chunfu Zhu
Zhejiang	Shaoxing Second Hospital	Prof. Zaiyang Zhang
Heilongjiang	The Second Affiliated Hospital of Harbin Medical University	Prof. Yunfu Cui
Jiangsu	Changshu No. 1 People's Hospital	Prof. Jianfeng Gu
Shanghai	Eastern Hepatobiliary Surgery Hospital	Prof. Xiaoqing Jiang
Zhejiang	The First Affiliated Hospital of Wenzhou Medical University	Dr. Bo Yang
Jiangsu	Wuxi Second People's Hospital	Prof. Huihan Jin
Zhejiang	Taizhou Municipal Hospital	Prof. Chong Jin
Jiangsu	Nantong Tumor Hospital	Prof. Hongyu Cai
Yunnan	The First Affiliated Hospital of Kunming Medical University	Prof. Kunhua Wang
Jilin	China-Japan Union Hospital of Jilin University	Prof. Hong Cao

Supplementary Appendix 2

We thank the following individuals for their significant contributions to the Chinese Research Group of Gallbladder Cancer study: Dr. Yang Yang, Dr. Xiao-Ling Song, Dr. Cheng-Kai Jiang, Dr. Li-Guo Liu, Dr. Rui Bian, Dr. Guo-Qiang Li, Dr. Hui-Jie Miao, Dr. Rui-Yan Yuan, Dr. Zi-Yi Wang, Dr. Si-Yuan Yan, Dr. Lin Li, Dr. Xue-Chuan Li, Dr. Lu Zou, Dr. Ke Liu, Dr. Xu-Heng Sun, Dr. Ling-Xiao Zhang, Dr. Yi-Ming Li, Dr. Wei Dang, Dr. Ze-Xu Chen, Dr. Le-Tai Liao, and Dr. Jun-Jie Li at Shanghai Key Laboratory of Biliary Tract Disease Research; Dr. Kai Qu at The First Affiliated Hospital of Xi'an Jiaotong University; Prof. Rong-Sheng Zhang and Prof. Ling Zhang at Shanxi Provincial Cancer Hospital; Prof. Xian-Hai Mao at People's Hospital of Hunan Province; Prof. Fu-Bao Liu at The First Affiliated Hospital of Anhui Medical University; Prof. Lei Zou at The First Affiliated Hospital of Kunming Medical University; Dr. Lei Wang at Wuxi Second People's Hospital; and Dr. Jie Zhang at Xinhua (Chongming) Hospital Affiliated to Shanghai Jiao Tong University School of Medicine.