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Original research

Surgical strategy for gastric cancer patients with liver cirrhosis: A retrospective cohort study

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HIGHLIGHTS

- We aimed to choose surgical strategies for gastric cancer patients with cirrhosis.
- Radical operation can be tolerated in class A Child-Pugh gastric cancer patients.
- D1 lymph node dissection is recommended in class B gastric cancer patients.
- Radical gastrectomy is very dangerous, even fatal for class C patients.

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ABSTRACT

Introduction: Recent studies have shown that radical gastrectomy with extended lymphadenectomy is feasible in gastric cancer patients with liver cirrhosis, but in those studies the main proportion was Child-Pugh class A patients. It is still difficult to choose reasonable surgical strategies for gastric cancer patients with cirrhosis, especially for Child-Pugh class B patients.
Methods: We reviewed the medical records of patients with liver cirrhosis who had undergone radical gastrectomy between January 2001 and December 2012. The clinical characteristics, postoperative complications, mortality and long-term outcomes in the 58 patients were investigated.
Results: Severe complications and postoperative mortality occurred more frequently in class B patients than in class A patients ($P < 0.05$). In patients with class A and B, the complications and mortality rate was 37.5% and 4.2% in D1 lymph node dissection group and 71.9% and 25% in D2 lymph node dissection group, respectively. Kaplan–Meier survival analysis showed longer survival for class A patients than for class B patients ($P < 0.05$). For class B patients with advanced gastric cancer, D2 lymph node dissection could not provide a longer survival than D1 lymph node dissection ($P = 0.282$).
Conclusion: Radical operation with D1 or D2 lymph node dissection can be tolerated in class A gastric cancer patients. D1 lymph node dissection is recommended in class B patients, and radical gastrectomy is very dangerous, even fatal for class C patients.

1. Introduction

Despite a major decline in incidence and mortality, gastric cancer (GC) is still one of the most commonly diagnosed tumors worldwide [1]. In 2008, about 0.98 million new GC cases were diagnosed and 0.74 million GC deaths occurred in the world [2]. The geographical distribution of GC is very different, and the incidence is particularly high in East Asia, Eastern Europe, Central and South America [3,4]. In 2008, incidence and mortality of GC ranked second in China, after lung cancer [5].

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Liver cirrhosis (LC) is a major complication of viral hepatitis and schistosomiasis, which are once endemic in China [6,7]. Therefore, LC is frequently encountered among candidates for GC surgery. It is well known that surgery in patients with LC is dangerous and the incidence of postoperative complications and postoperative mortality is high [8–10]. Several studies from Japan and Korea have discussed the risk of GC surgery in LC patients [11,12]. However, it is still difficult and controversial to develop the therapeutic strategies for GC patients with LC, especially to keep the balance between the extent of surgery and the incidence of postoperative complications and mortality. Therefore, in this retrospective study we reviewed the causes of cirrhosis, postoperative complications, mortality in GC patients with LC, with the aim to choose the best surgical strategy for these patients.

2. Methods

2.1. Patients

We reviewed the medical records of 3417 patients who were diagnosed as gastric adenocarcinoma by pathological biopsy at Huashan Hospital affiliated to Fudan University between January 2001 and December 2012. Of those patients, 74 patients had LC. Four patients who had palliative surgery and 12 patients who had no surgery due to severe liver dysfunction, late staging and poor physical conditions were excluded. Finally, the clinical data of 58 patients were analyzed in this study.

2.2. Preoperative evaluation and surgical procedure

LC was confirmed primarily by existing pathological results or preoperative biopsy. In patients who had no liver biopsy, LC was diagnosed based on the history of liver disease, preoperative blood biochemical examination, CT scan, ultrasonography imaging and findings during the operation. For 9 patients with LC due to schistosomiasis japonica, postoperative pathological reports showed that Schistosome eggs were deposited in gastrointestinal submucosal.

Preoperative assessment included complete blood count, blood biochemical tests, blood coagulation function and serologic tests for hepatitis virus antigen and antibody (including hepatitis B virus surface antigen (HBsAg), hepatitis B virus surface antibody (HBsAb), hepatitis B virus e antigen (HBeAg), hepatitis B virus e antibody (HBeAb), hepatitis B virus core antibody (HBcAb) and hepatitis C virus antibody (HCVAb)). The Child-Pugh classification was used to evaluate the severity of liver damage. In some patients whose original score was from the Child classification, the Child-Pugh classification was applied to re-evaluate.

Curative surgery was defined as subtotal or total gastrectomy and D1 or D2 lymphadenectomy according to Japanese gastric cancer treatment guidelines 2010 [13]. D1+ Nos. 8a and/or 9 LN dissection was classified as D1 lymphadenectomy in this study. Early gastric cancer comprised of T1 tumors irrespective of lymph node metastasis, and TNM staging was determined as described previously [14]. Nasogastric or nasojejunal decompression and 1 or 2 closed abdominal drains were used routinely. The nasogastric or nasojejunal tube was usually left for a few days until the return of bowel function. Drainage tube was removed after eating and daily drainage volume was less than 150 ml. Massive ascites was defined as postoperative drainage of more than 500 ml per day.

2.3. Collection of clinical data

The following clinical data were extracted and analyzed: demographic findings, cause of cirrhosis, Child-Pugh class, extent of gastric resection, extent of lymphadenectomy, postoperative albumin infusion, postoperative diuretics, tumor stage, postoperative complications, postoperative mortality, daily drainage volume through the Jackson–Pratt drain in two weeks after surgery and long-term outcomes.

2.4. Statistical analysis

Statistical analysis was performed using the SPSS 18.0. Collected data were expressed as medians, frequencies, percentages and mean ± SD. The chi-squared test or Fisher's exact test, and Student's t test were used for the comparison. Overall survival (OS) was calculated from the time of operation to the date of death or the most recent follow-up. Survival curves were estimated using the Kaplan–Meier method and compared by the log-rank test. The chi-squared test or Fisher's exact test and Student's t test were two-sided. Statistical significance was set at $p < 0.05$.

3. Results

3.1. Clinical characteristics

A total of 58 patients with liver cirrhosis who underwent curative surgery for GC were enrolled in this study. Patients' baseline characteristics were shown in Table 1. There were 44 male (75.9%) and 14 female (24.1%) patients with a median age of 63 years (range, 39–75 years). Twenty-five (43.1%), thirty-one (53.5%) and two (3.4%) patients were classified into class A, B and C, respectively. In 35 patients, LC was confirmed by pathological results. The causes of cirrhosis were HBV (70%), schistosomiasis (15.5%), HCV (12.1%), alcohol (1.7%) and cryptogenic (1.7%). Schistosomial cirrhosis occurred more frequently in class A than in class B and C ($P = 0.004$).

Table 1
Patients' characteristics.

	Child-Pugh classification			Total ($n = 58$)
	Class A ($n = 25$)	Class B ($n = 31$)	Class C ($n = 2$)	
Age (years)				
Median	64	63		63
Range	39–75	42–72	48,65	39–75
Sex				
Male	18 (72%)	24 (77.4%)	2 (100%)	44 (75.9%)
Female	7 (28%)	7 (22.6%)	0	14 (24.1%)
Cause of cirrhosis				
Hepatitis B virus	14 (56%)	24 (77.4%)	2 (100%)	40 (70%)
Hepatitis C virus	1 (4%)	6 (19.4%)	0	7 (12.1%)
Schistosomiasis	8 (32%)	1 (3.2%)	0	9 (15.5%)
Alcohol	1 (4%)	0	0	1 (1.7%)
Cryptogenic	1 (4%)	0	0	1 (1.7%)
Extent of gastric resection				
Subtotal gastrectomy	20 (80%)	22 (71%)	2 (100%)	44 (75.9%)
Total gastrectomy	5 (20%)	9 (29%)	0	14 (24.1%)
Extent of lymphadenectomy				
D1 lymphadenectomy	10 (40%)	14 (45.2%)	2 (100%)	26 (44.8%)
D2 lymphadenectomy	15 (60%)	17 (54.8%)	0	32 (55.2%)
Postoperative albumin	20 (80%)	29 (93.5%)	2 (100%)	49 (84.5%)
Postoperative diuretics	8 (32%)	22 (71%)	2 (100%)	32 (55.2%)
Tumor stage				
IA	2 (8%)	4 (13%)	0	6 (10.4%)
IB	6 (24%)	5 (16.1%)	0	11 (19%)
IIA	1 (4%)	2 (6.4%)	0	3 (5.2%)
IIB	4 (16%)	6 (19.4%)	0	10 (17.2%)
IIIA	6 (24%)	8 (25.8%)	0	14 (24.1%)
IIIB	4 (16%)	4 (12.9%)	2 (100%)	10 (17.2%)
IIIC	2 (8%)	1 (3.2%)	0	3 (5.2%)
IV	0	1 (3.2%)	0	1 (1.7%)