Surgical Treatment for Superficial Esophageal Cancer with Liver Cirrhosis and Esophageal Varices: Report of a Case

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Abstract. Surgical treatment of esophageal cancer is substantially invasive and often entails some postoperative complications. Perioperative management for patients with liver cirrhosis involves great difficulties. Recently, we conducted an esophagectomy for the treatment of superficial esophageal cancer in a 52-year-old male patient with liver cirrhosis and esophageal varices, with gratifying results. Although the hepatic function was impaired, as indicated by a reduced indocyanine green R15 value of 27.4%, the patient was assessed as capable of tolerating operative procedures. The procedures comprised a subtotal esophagectomy through a transhiatal approach, an anastomosis of the cervical esophagus with a gastric tube via the posterior mediastinal route, and super drainage of the short gastric vein of the gastric tube. The patient had an uneventful postoperative course without any complications such as anastomotic leakage or pneumonia. It is considered practicable to accomplish an esophagectomy by careful appraisal of liver function and planning of the operative procedure and perioperative management even in patients with liver cirrhosis.

Case Report

The patient was a 52-year-old man who received surgical treatment for rectal cancer in 2000, on which occasion alcoholic liver cirrhosis was detected. In the course of treatment for ascites due to alcoholic liver cirrhosis, esophageal varices were noted (Lm F2 Cw RC(+)) on an upper gastrointestinal endoscopy. The patient was referred to our hospital for endoscopic sclerotherapy in 2005.

Physical findings. The patient was alert, had no anemia or icterus, and no remarkable findings were noted in the neck or the chest. There was no sign of ascites.

Laboratory tests on admission. Mild anemia (Hemoglobin, 10.9 g/dl) and marked impairment of liver function (γ-glutamyltransferase, 256 IU/L; indocyanine green (ICG) test R15, 27.4%; and K-indocyanine green test (KICG), 0.100%) were noted. Blood tests for tumor markers and hepatitis virus markers were negative (Table I).

Esophagography. The examination revealed a superficial 0-Iic esophageal cancer of about 20 mm in the major diameter in the upper thoracic esophagus, and esophageal varices, discontinuous from the former, in the lower thoracic esophagus (Figure 1).

Esophagoscopy. An irregular depressed lesion measuring 20 mm in the major diameter was noted on the anterior wall, extending 24 to 26 cm from the incisal dentition. The depressed surface of the lesion was somewhat deep with a sharp margin, thick, and had granules and nodules varying in size; the lesion was diagnosed as Type 0-Iic esophageal cancer with a depth of invasion ≥SM2. Microscopic examination of a biopsy specimen revealed the lesion to be squamous cell carcinoma with esophageal varices (Lm F2 Cw RC(+)) (Figure 2).
the liver surface was uneven and irregular, and a small amount of ascites was noted anterior to the liver.

Based on the above findings, a diagnosis of superficial esophageal carcinoma (Ut, 0-Iic, T1b, N0, M0, Stage I) with alcoholic liver cirrhosis (Child B) and esophageal varices (Lm F2 Cw RC(+)) was made. The depth of invasion of the esophageal carcinoma was ≥SM 2, so that there was no indication for endoscopic mucosal resection. The liver function was depressed (ICG R15, 27.4%), yet the hepatic function reserve was B tending to A according to Child’s classification. Hence, the patient was considered capable of tolerating surgical treatment, which thus was selected.

Operation. With endoscopic assistance, a subtotal esophagectomy was performed through a transhiatal approach, in combination with splenectomy, and an anastomosis created between the cervical esophagus and the gastric tube via the posterior mediastinal route. To prevent congestion of the reconstructed gastric tube, the short gastric vein was anastomosed with the anterior jugular vein in the neck for super drainage (Figure 3). The procedure was Do, Ro, curability B operation, and the thoracic duct was conserved. The estimated blood loss was 650 ml and the operating time was 6 hours and 50 minutes.

Histopathological examination. The esophageal cancer was a moderately differentiated squamous cell carcinoma with invasion into the submucosa (pT1b), pN0, ly1, v0, pPM(−), pDM(−) and pStage I. The spleen was slightly congested.

Postoperative course. Respirations were assisted with a respirator on the day of operation and the endotracheal tube was removed on the 1st postoperative day. The patient was started on enteral nutrition on the 3rd postoperative day. No remarkable changes were found in the respiratory/cardiovascular system, hepatic function, or blood coagulation system. The patient had an uneventful convalescence, without complications such as anastomotic leakage or pneumonia, and was discharged on the 23rd postoperative day.

Discussion

Surgical intervention for the treatment of esophageal cancer is substantially invasive, and moreover in patients with liver cirrhosis, postoperative complications are extremely high in incidence and surgical results are
reported ungratifying (2-6). In cases indicated for operation for esophageal cancer with liver cirrhosis, therefore, a thorough preoperative evaluation including the assessment of liver function is required along with selection of an appropriate procedure and perioperative phase management based on the evaluation.

In preoperative assessment of liver function, Child's classification, serum albumin level, cholinesterase level, KICG, ICG Rmax, ICG R15, prothrombin activity and hepaplastin test usually serve as indicators of the necessity for surgery. It is difficult, however, to determine indication for an operation and selection of a surgical procedure based solely on these parameters, partly because of the scarcity of clinical cases studied. Under such circumstances, Ohta et al. (7) reported that they investigated relations of the ICG R15 value and operative procedures with postoperative complications and prognosis in 40 patients with esophageal cancer associated with hepatic dysfunction. Their results disclosed an incidence of postoperative complications of as high as 70% for cases with an ICG R15 of 15% or more, and frequent occurrence of serious complications and in-hospital deaths for cases with an ICG R15 of 20% or more, stressing the importance of careful consideration of surgical indications and selection of operative procedures. In a study conducted by Yoshizumi et al. (8) in 18 patients surgically treated for esophageal cancer with liver cirrhosis, an esophagectomy using a standard procedure was feasible in patients who had an ICG R15 lower than 20%, yet complications occurred in 16 out of 20 patients and the in-hospital mortality rate was 2 out of 20 patients. Nakajima et al. (9) reported that postoperative complications were noted in 10 out of 11 patients studied, and that, in particular, all 3 patients with an ICG R15 of 25% or more died intraoperatively or prior to discharge; the authors therefore concluded that a careful decision was necessary on whether or not an operation should be undertaken. Furthermore, Fekete et al. (5) found anastomotic leakage in 3 out of 23 patients treated, of whom 2 patients succumbed, and reported that such anastomotic leakage in patients operated on for esophageal cancer with liver cirrhosis led to a grave prognosis. Similarly, Tachibana et al. (10) documented that of 18 patients treated, 3 died intraoperatively, including 2 with anastomotic leakage.

Generally, the following postoperative complications have been reported in patients with liver cirrhosis: impairment of hepatic function, increased ascites, increased susceptibility to infection and hemorrhagic tendency. Besides these, anastomotic leakage is another complication that occurs as frequently as 13% to 83% in operations involving reconstruction of the gastrointestinal tract and has been reported to be associated with a fatal outcome if accompanied by pyothorax and sepsis (5). It has been pointed out that depressed hemoglobin oxygen saturation consequent to reduced arterial blood inflow and increased shunt blood flow caused by congestion of the reconstructed gastric tube may possibly account for the high incidence of anastomotic leakage in patients operated on for esophageal cancer with liver cirrhosis (11, 12). To control that complication, in the present case we set up a super drainage of the short gastric vein of the gastric tube in the neck as a preventive device against congestion of the reconstructed gastric tube. Consequently, no anastomotic leakage occurred and the patient had an uneventful postoperative course.

As a surgical procedural problem, massive intractable pleural effusion and ascites have been reported postoperatively in patients in whom the thoracic duct was ligated for regional lymphadenectomy (13). The thoracic duct was conserved in the present case, in which there was no postoperative involvement of pleural effusion or ascites.

Early initiation of enteral nutrition after an operation is reportedly useful in the perioperative nutritional management in patients with liver cirrhosis in that it provides an increase in portal blood flow and thereby hastens the improvement of hepatic function (14). In the present case, enteral nutrition was started on the 3rd postoperative day and both the liver function and nourishment were satisfactory post operation.

Thus, gratifying results of the operation were achieved in this patient, who was at extremely high risk for complications following esophagectomy as indicated by an ICG R15 value of 27.4%, using the following procedures: esophagectomy without thoracotomy as a means to lessen surgical invasiveness, conservation of the thoracic duct for the control of pleural effusion and ascites, super drainage of the short gastric vein to prevent congestion of the reconstructed gastric tube, and early initiation of enteral nutrition for perioperative nutritional management.

Radiation therapy combined with chemotherapy has also been reported as a non-surgical treatment modality for esophageal cancer, which yielded therapeutic results comparable with surgical results (15). In patients with liver cirrhosis, nevertheless, it is not uncommon that pancytopenia and esophageal varices due to hypersplenism are present even prior to treatment of the cancer. Eventually, worsening of these complications occurs owing to adverse events associated with radiation therapy combined with chemotherapy such as myelosuppression, esophagitis and liver dysfunction, and hence to failure in accomplishing the treatment. There is also a risk of rupture of esophageal varices. Insofar as the patient can tolerate the operation, therefore, surgical treatment would be more appropriate and may be accomplished safely with various means as in the present case.

It is considered practicable to accomplish an esophagectomy by careful appraisal of liver function and planning of the operative procedure and perioperative management even in patients with liver cirrhosis.
Figure 2. Esophagoscopy: Type 0-IIc esophageal cancer was noted on the anterior wall, extending 24 to 26 cm from the incisal dentition (a). Type 0-IIc esophageal cancer without iodine staining was observed (b) with esophageal varices (c).

Figure 3. Operation findings: To prevent congestion of the gastric tube, the short gastric vein was anastomosed with the anterior jugular vein in the neck for super drainage.
References


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