

Laparoscopic total gastrectomy with spleen-preserving splenic hilar (No. 10) lymph node dissection for gastric cancer is still a challenging procedure

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Abstract: To perform the laparoscopic surgery for locally advanced gastric cancer located in proximal third of the stomach, laparoscopic lymphadenectomy for splenic hilar lymph nodes is essential procedure. The important point of this procedure is how to perform it without injuring the splenic vessels and parenchyma of the spleen and pancreas. This video presentation shows meticulous dissection of the lymph nodes around the distal pancreas and spleen without bleeding. The laparoscopic technique in this video can provide insight into the challenge for surgeons. However, laparoscopic total gastrectomy for locally advanced gastric cancer still needs confirmative clinical evidence. Therefore, it should be performed for selected patients by the experienced surgeons.

Keywords: Gastric adenocarcinoma; total gastrectomy; laparoscopic surgery

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The dissection of splenic hilar lymph nodes in gastric cancer surgery is indispensable for treating gastric cancers located in the proximal third of the stomach. According to the treatment guidelines suggested by the Japanese Gastric Cancer Association, extended lymphadenectomy (D2) for total gastrectomy should include the No. 10 lymph nodes around the splenic hilum (1). However, one randomized controlled clinical trial comparing D1 and D2 lymph node dissection in gastric cancer surgery showed increased mortality and morbidity rates in the D2 group, and the splenectomy for D2 lymph node dissection was presumed to be one of the reasons for this difference (2). In addition, splenectomy for lymph node dissection may increase the postoperative transfusion and infection rates, contributing to the poor prognosis of cancer patients (3). Theoretically, the best option for a patient with advanced gastric cancer requiring total gastrectomy is to undergo D2 lymph node dissection without splenectomy. However, spleen-preserving D2 lymph node dissection is not a simple technique, even under open laparotomy, because of the tortuous splenic vessels and the high possibility of injury to the parenchyma of the spleen and pancreas. During laparoscopic

surgery, the surgeons depend on the monitor and lack tactile sensation, and the movement of the laparoscopic instruments is limited. As such, this technique, which was introduced by Li *et al.*, is very challenging (4).

The critical point of this procedure is how to perform the laparoscopic en-block dissection of the lymph nodes around the distal splenic arteries and splenic hilum without injuring the splenic vessels and parenchyma of the spleen and pancreas. There are wide variations in the distribution of the splenic vessels and the shape of the pancreatic parenchyma among patients. This variation may increase the likelihood of bleeding from branches of the splenic vessels and the postoperative leakage of pancreatic juices. As such, en-block dissection of LN 11d (lymph nodes around distal splenic artery) and LN 10 without splenectomy is thought to be not easy. Prompt control of intraoperative bleeding during the dissection of lymph nodes around splenic vessels is more difficult in laparoscopic surgery than in open laparotomy. Therefore, meticulous traction of the soft tissues around the splenic vessels is required to identify the precise plane for dissection that is required to prevent

bleeding. The video in this report details these techniques. Another report recommended that the traction of splenic vessels using strings could make it easier to dissect the lymph nodes around the splenic vessels (5). Surgeons who want to try laparoscopic dissection for splenic hilar lymph nodes should consider the various methods available.

In the present case report, the patient was diagnosed pathologically with stage IIIC (T4aN3M0). Although the surgeon had reasonable laparoscopic technique for D2 lymph node dissection accompanied by total gastrectomy, the use of laparoscopic surgery for treating advanced gastric cancer should be carefully evaluated to confirm its safety and efficacy relative to open conventional surgery. The efficacy of laparoscopic surgery for gastric cancer is currently being evaluating in randomized, controlled clinical trials, such as the KLASS trial by Korean surgeons (registered in www.clinicaltrials.gov as NCT00452751), which only includes patients with early gastric cancer. However, three studies using meta-analysis have already reported the advantages and the non-inferiority of laparoscopic surgery compared to open laparotomy (6-8), and then several retrospective studies have present about the possibility of laparoscopic extended lymph node dissection (9-11). Based on these results, clinical studies investigating the efficacy of laparoscopic extended lymph node dissection for advanced gastric cancer have been recently launched by Korean and Chinese groups (registered in www.clinicaltrials.gov as NCT01456598 and NCT01609309). However, the application of laparoscopic total gastrectomy for advanced gastric cancer has other unresolved issues, such as the dissection of LN 11d and LN 10 and laparoscopic esophagojejunostomy for reconstruction. Accordingly, the inclusion criteria for a recent prospective clinical study for total gastrectomy was limited to patients with clinical stage I disease (registered in www.clinicaltrials.gov as NCT01584336). Therefore, an experienced surgeon should perform the laparoscopic total gastrectomy, which includes the dissection of LN 11d and 10, and it has to be limited to selected patients until clinically proven in a wider patient population. Nevertheless, the laparoscopic technique presented by Dr. Li in this video can provide insight into the challenges involved in this type of surgery.

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