学 位 論 文 の 要 旨

氏名　岸 隆

学 位 論 文 名　A Risk Analysis for Ischemic Necrosis of the Remnant Stomach After Distal Pancreatectomy in Patients With Previous Distal Gastrectomy: A Multicenter Retrospective Survey by the Japanese Society of Pancreatic Surgery

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著 者 名　Takashi Kishi, Minako Nagai, Yoshitsugu Tajima, Hikota Hayashi, Kohei Nishio, Yasunari Kawabata, Kenichiro Uemura, Kengo Fukuzawa, Shintaro Yagi, Masaaki Hidaka

論 文 内 容 の 要 旨

INTRODUCTION

The stomach receives its principal blood supply from the left and right gastric arteries, left and right gastroepiploic arteries, the posterior gastric artery, and the short gastric arteries, with additional contributions from vessels such as the left inferior phrenic and esophageal arteries. Distal gastrectomy (DG), a standard surgical procedure for both benign and malignant gastric diseases, involves resection of approximately two-thirds of the stomach. Consequently, arterial blood flow to the remnant stomach after DG relies primarily on the short gastric arteries and the posterior gastric artery. When distal pancreatectomy (DP) is required after DG, the risk of ischemic necrosis of the remnant stomach (INS) becomes a serious concern because DP involves dissection of the short gastric arteries. Previous reports have described INS as a rare but highly lethal complication, with mortality rates approaching 70% in some series. However, most prior studies were limited to small case reports or single-center experiences, leaving uncertainty

regarding the incidence and risk factors. Therefore, this multicenter retrospective study, conducted under the auspices of the Japanese Society of Pancreatic Surgery (JSPS), aimed to clarify the acutual incidence and risk factors for INS in patients undergoing DP after DG.

MATERIALS AND METHODS

A nationwide questionnaire survey was distributed to 175 JSPS-affiliated institutions in 2020. Data were collected on patients who underwent DP between July 2009 and December 2019, with a specific focus on those with a prior history of DG. Among 13,866 distal pancreatectomies performed during the study period, 414 patients had previously undergone DG. After excluding 50 patients who received planned or necessary total remnant gastrectomy during DP, 364 patients remained eligible for analysis. Patient demographics, nutritional indices, prior gastric disease, reconstruction methods, interval between DG and DP, pancreatic pathology, operative details, intraoperative management of blood vessels, and postoperative outcomes were reviewed. INS was defined as either unexpected partial or total resection of the remnant stomach during or after DP due to remnant gastric ischemia. Statistical analyses included univariate comparisons and multivariate logistic regression to identify independent predictors of INS. The study protocol was approved by the Medical Research Ethics Committee of Shimane University Faculty of Medicine (approval number: 20201027-1).

RESULTS AND DISCUSSION

Seventeen (4.7%) of the 364 eligible patients developed INS, of whom 15 required gastric resection during DP and 2 underwent reoperation after DP. In the non-INS group (n=347), 19 patients experienced gastric ischemia-related complications such as delayed gastric emptying, ulcers, or erosive gastritis; however, all were successfully managed with conservative treatment.

A multivariate analysis of preoperative risk factors identified prior DG for gastric cancer (odds ratio [OR] 6.12, p=0.017) and DP for pancreatic ductal adenocarcinoma (OR 6.19, p=0.017) as independent risk factors for INS. Both factors involved surgical procedures that require lymph node dissection and extensive removal of surrounding tissues, potentially compromising blood flow to the remnant stomach.

An analysis of intraoperative risk factors revealed that dissection of the left inferior phrenic artery (LIPA) was the only independent risk factor for INS, with an OR of 51.9 ($p<0.001$). Previous studies have demonstrated that preservation of the LIPA during DP after DG helps maintain blood supply to the remnant stomach, supporting our findings. Because the blood supply of the remnant stomach after DG depends mainly on the short gastric arteries, collateral blood flow from the LIPA becomes particularly important when DP is performed after DG.

CONCLUSION

DP following DG carries a potential risk of serious ischemic complications of the remnant stomach, and preservation of the LIPA during DP is crucial for preventing INS. Futhermore, careful surgical management is especially required in patients undergoing DP for pancreatic cancer and in those with a history of DG for gastric cancer, as these patients are at higher risk for INS after DP. The development of reliable intraoperative quantitative assessment tools for gastric blood flow is warranted.