ORIGINAL ARTICLE

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Dual-radionuclide simultaneous gastric emptying and bile transit study after gastric surgery with double-tract reconstruction

Kenichi NAKAJIMA,* Masaya KAWANO,* Shinichi KINAMI,** Takashi FUJIMURA,**
Koichi MIWA** and Norihisa TONAMI*

*Departments of *Nuclear Medicine and **Gastroenterologic Surgery, Kanazawa University Hospital*

Objective: The physiology of gastrointestinal transfer function after proximal gastrectomy with bypass-tract reconstruction is not well understood. We applied a simultaneous dual-radionuclide method with a hepatobiliary imaging and gastric emptying study to evaluate physiologic alterations occurring after surgery. ***Methods:*** Nineteen patients with early gastric cancer, including 9 preoperative control patients and 10 who had proximal gastrectomy and double-tract reconstruction surgery were examined by dual-radionuclide hepatobiliary and gastric emptying studies (^{99m}Tc PMT and ^{111}In DTPA). Retention fraction in the stomach at 3 minutes (R3) and 60 minutes (R60) and gastric emptying half-time (GET) were calculated. Bile reflux and mixture of bile and food were also evaluated. ***Results:*** The retention fractions of R3 and R60 were significantly lower in the double-tract reconstruction group than those in the preoperative group. GET differed significantly between the double-tract and preoperative groups (20.7 min ± 7.1 min and 36.2 min ± 11.0 min, $p = 0.0018$). The mixture of bile and food was not good in the double-tract reconstruction group ($p = 0.014$ vs. preoperative). Patients with a large residual stomach showed slower initial emptying ($p = 0.0068$) and a better mixture of bile and food ($p = 0.058$) compared to those with a small residual stomach. The bile reflux was not significantly increased after surgery. ***Conclusion:*** The dual-radionuclide gastrointestinal and hepatobiliary imaging was feasible and could demonstrate characteristic transit patterns of the foods and bile in the double-tract reconstruction procedure. A larger residual stomach, if possible, is desirable to provide better transfer and mixing of bile and foods.

Key words: gastric emptying study, gastric cancer, postoperative study, hepatobiliary imaging, dual-radionuclide acquisition