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Long-term changes in pancreatic volume and endocrine function after pancreaticoduodenectomy for peri-ampullary neoplasms using pancreas-volumetry: A retrospective single center study

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Background : Studies that include long-term follow-up of endocrine function including serial volume of pancreas in patients with pancreaticoduodenectomy for peri-ampullary neoplasm are very rare due to the difficulty of measuring the volume of the pancreas. We aimed to evaluate the long-term pancreatic functional outcomes including pancreas-volumetry of pancreaticoduodenectomy for peri-ampullary neoplasms.

Methods : This retrospective study enrolled 355 consecutive patients with at least 12-month follow-up who underwent elective pancreaticoduodenectomy for peri-ampullary neoplasms in a single university hospital between January 2008 and December 2019. Perioperative and postoperative outcomes, long-term endocrine function of pancreas, and pancreatic volume changes at 12 months postoperatively were evaluated.

Results : Mean age was 65.4 and sex ratio was 1.38 (Men, n=206, 58.0%). The proportion of pre-diagnosed diabetes mellitus was 31.5% (n=112). The origin of the peri-ampullary neoplasm was in the order of pancreas (n=174, 49.3%), common bile duct (n=96, 27.0%), ampulla of Vater (n=65, 18.3%), and duodenum (n=19, 5.4%). Mean operative time was 561 minutes. Clinically relevant postoperative pancreatic fistula (Grade B and C) rate was 22.3% (n=79). The postoperative 1-, 3-, 6-, and 12-month proportion of diabetes mellitus diagnosed before surgery plus new-onset diabetes mellitus after surgery were 40.0%, 43.1%, 44.2%, and 49.9%, respectively. The preoperative, postoperative 1-, 3-, 6-, and 12-month mean volume of pancreas were 82.3mm³, 38.7mm³, 28.1mm³, 24.9mm³, and 25.5mm³, respectively.

Conclusions : Pancreatic endocrine function and pancreatic volume continue to decline for at least 12 months after pancreaticoduodenectomy for peri-ampullary neoplasm. Further studies on the cause of pancreatic endocrine dysfunction and decreased remnant pancreatic volume after pancreaticoduodenectomy are needed.

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