Video Symposium II

Pancreatoduodenectomy-Special Reference to GDA & Retroperitoneal Margin

Department of Surgery, Soonchunhyang University College of Medicine, Soonchunhyang University Bucheon Hospital

Jun Chul Chung

Reference to Gastroduodenal Artery (GDA)

Pancreatoduodenectomy (PD) has advanced greatly in the last two decades with dramatic decrease in its mortality rate. Despite the reduction in mortality, the morbidity remains high. Pancreatic and biliary fistulas and delayed gastric emptying are most common complications after PD. Visceral artery pseudoaneurysms are uncommon, and a gastroduodenal artery (GDA) pseudoaneurysm is especially rare, but most of these aneurysms were detected after rupture. If a GDA pseudoaneurysm ruptures, the patient faces a severely life threatening condition, requiring emergency treatment. So, many surgeons have developed different surgical techniques in an attempt to prevent GDA pseudoaneurysm formation. I think two things must be considered in handling GDA. (1) How can I prevent GDA pseudoaneurysm formation? (2) How can I treat if the GDA pseudoaneurysm was developed? A pseudoaneurysm is a pulsatile hematoma that communicates with an artery via a disruption of the arterial wall. The pathogenesis for peudoaneurysm formation remains unknown. However, digestion of an arterial wall near a pancreaticojejunal leak by trypsin and elastase is one suggested mechanism. So, I think it is a very important point to minimize intimal injury of GDA stump. In my cases, I usually apply Hemoclip or Hemolock after GDA gently ties with silk. Current studies have suggested that angiographic embolization is an effective first-line treatment in a pseudoaneurysm from the GDA stump after PD. Some authors claim that angiographic trapping of the hepatic artery proximal and distal to the GDA stump should be performed. Conversely, others have reported successful outcomes with selective embolization of the GDA stump. The important point in the coil embolization of the hepatic artery is the occurrence of a liver abscess. The incidence of liver abscess after embolization can be more than 30% and transient ischemia and hepatic failure can also occur. So, I think that selective embolization of the GDA stump has significant clinical benefits to maintain liver blood flow. In my cases, I usually leave a long segment (about 1 cm) of the GDA stump to possible coil embolization in GDA.

Reference to Retroperitoneal Margin

The reported proportion of patients having tumor involved resection margins (R1 resection) after PD varies considerably, in the range 31-85% for pancreatic tumor and 2-27% for ampullary tumor. The large variation may partly be explained by underreporting of R1 resections due to non-standardized protocols for microscopic evaluation of the resection margins. Typically surgical margins of PD specimen are luminal (proximal gastric and distal duodenal/jejunal), pancreatic (pancreatic transaction margin), bile duct, and retroperitoneal. However, standardized protocols regarding the pathologic assessment of the retroperitoneal margin of the PD specimen are not routinely applied partly because of its unfamiliar anatomy. The retroperitoneal margin of the PD specimen was defined by some authors as "the soft tissue margin directly adjacent to the proximal 3 to 4 cm of superior mesenteric artery (SMA)". Others defined it as "the peripancreatic adipose tissue behind the head of the pancreas that is located dorsally and laterally to the SMA". I defined the retroperitoneal margin as the area of sharp dissection in the peripancreatic fatty tissue behind the pancreatic head and lateral to the mesenteric vessels. The retroperitoneal margin of the PD specimen has circumferential structure. So, I di-

vide into three components: vascular groove, uncinate resection margin, and posterior surface margin. In order to deliver the specimen, the surgeon needs to divide the soft tissue adjacent to the uncinate process as close to the SMA as possible, creating what is known as the uncinate resection margin. I usually mark the uncinate resection margin using the color ink. So, pathologist easily identifies the retroperitoneal resection margins.

References

1. Lee HK, Heo JS, Choi SH, et al. Management of bleeding from pseudoaneurysms following pancreaticoduodenectomy. World J Gastroenterol 2010;16:1239-1244.
2. Otah E, Cushin BJ, Rozenblit GN, et al. Visceral artery pseudoaneurysms following pancreatoduodenectomy. Arch Surg 2002;137:55-59.
3. Verbeke CS. Resection margins and R1 rates in pancreatic cancer-are we there yet? Histopatholgy 2008;52: 787-796.
4. Khalifa MA, Maksymov V, Rowsell C. Retroperitoneal margin of the pancreaticoduodenectmy specimen: anatomic mapping for the surgical pathologist. Virchows Arch 2009;454:125-131.