Pancreaticoduodenectomy

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Pancreatic cancer is the fourth common cause of cancer death, and its 5-year survival rate is only about 8 percent. Pancreatic resection is a major surgical procedure, including a pancreaticoduodenectomy, also known as the Whipple procedure, in the surgical procedure of choice for the treatment of pancreatic cancer. This activity reviews the indications, technique, and outcomes of pancreaticoduodenectomy (PD) and the role of the interprofessional team in the management of patients who undergo this procedure.

Objectives:

- Outline the indications for pancreaticoduodenectomy.
- Describe the technique of pancreaticoduodenectomy.
- Summarize the outcomes of pancreaticoduodenectomy.
- Explain the importance of improving communication and coordination of care by the interprofessional team to improve pancreatic cancer patients undergoing pancreaticoduodenectomy.

Introduction

Pancreatic cancer is the fourth common cause of cancer death, and its 5-year survival rate is only about 8 percent. Pancreatic resection is a major surgical procedure, including a pancreaticoduodenectomy, also known as the Whipple procedure, in the surgical procedure of choice for the treatment of pancreatic cancer. Although the Whipple procedure has been performed for many years, it has become increasingly common since 1970 because of improvements in imaging, better intra-abdominal dissection and likewise the repair of the digestive system.[1] Due to the complex nature of pancreatic resection, it is important that the surgeon, anesthesiologist, and perioperative team have experience in pancreatic resection to minimize complications and improve patient outcomes.[2]

Finally, there are two types of pancreaticoduodenectomies, the more extensive Classical Whipple (CW) and the functional pancreaticoduodenectomy (FPD). The CW includes the complete pancreas and duodenum, the gall bladder, the proximal jejunum, the distal stomach, and the lymph nodes in the PD that are the channel is spared.

The pancreatic remnant is then anastomosed to the jejunum. The pancreatic duct and the pancreatic parenchyma are joined to the jejunum using a Roux-en-Y anastomosis. The biliary tract and the stomach are joined together with the jejunum. The complete process which starts from the lower part of the stomach and continues to the duodenum, the pancreatic duct, the biliary tract, and the jejunum is regarded as essential surgical procedure. Although the Whipple procedure is a complex procedure, it is a rescue treatment and poor prognosis compared with non-curative pancreas cancer.[3]

Pancreatic cancer survivors in the United States are increasing and projected to triple by 2030. Pancreatic cancer is a cancer associated further much the tumor is in mind. Resectable tumors have a very strong tendency to recur. Pancreatic cancer is the fourth leading cause of cancer-associated mortality in the United States. The patient can also have a cancer of the pancreas, which includes the pancreatic head, body, and tail. The pancreatic head is the most frequently affected part of the pancreas. The hepatic area is uncommon, and it arises from the left gastric artery.[4]

Pancreatic cancer is a cancer that has a poor survival rate. Surgery is the only option for the pancreatic cancer patient, 20% tend to be resected to the right of SMA. Also, 30% to the Pylori resection structure that is left of the SMA. The pancreatic cancer patient's survival rate is very low, and the pancreatic cancer patient is treated by Pylori. The patient can also have a cancer of the pancreas, which includes the pancreatic head, body, and tail. The pancreatic head is the most frequently affected part of the pancreas. The hepatic area is uncommon, and it arises from the left gastric artery.[5]

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Indications

- Pancreatic cancer (on the head of the pancreas)[7]
- The pancreatic neuroendocrine tumors (PNETs)[8]
- Intraductal papillary mucinous neoplasm (IPMN)[9]
- The intraductal papillary mucinous neoplasms (IPMN) with pancreatic intraepithelial neoplasia (PanIN)[10]
- The adenocarcinoma of the ampulla of Vater[11]
- The duodenal adenocarcinoma[12]
- Pancreatic cancer with the inflammatory mass in the head of the pancreas[13]
- Severe pancreatic trauma[14]

Contraindications

The contraindication for the procedure depends on the presence of variable factors. To better understand the contraindications, it is important to understand the technique of the procedure. Classically, the three grades of resectability are defined for localized pancreatic ductal adenocarcinoma (PDAC) based on the tumor, node, and metastasis.

Localized Pancreatic Cancer

- Distant metastasis, no radiographic evidence of portal vein (PV) or superior mesenteric vein (SMV) obstruction, clear fatty planes around the celiac axis, hepatic artery, and superior mesenteric artery (SMA)

Borderline Resectable

- SMV/PV involvement with distortion, narrowing, occlusion, but the presence of suitable proximal and distal venous vessels for resection and reconstruction, tumor abutting the SMA for less than 180 degrees, gastroduodenal artery involvement at the level of the hepatic artery without extending to the celiac axis, Tumor abutment of superior mesenteric artery not extending more than 180 degrees of the vessel circumference, tumor thrombus

- **Unresectable For Cancer of the Head (Contraindications of the Procedure)**

- Distance metastasis
- Tumor involvement of SMA more than 180 degrees
- Celiac axis involvement
- Aortic involvement
- Inoperable SMV or PV occlusion.[15]

Equipment

- A self-retaining retractor
- Bowel retractor/packing
- A linear cutter
- The clips
- The sutures
- Scissors
- The diathermy device
- Scalpels
- The surgical drains
- The meal-ready device

Personnel

The surgeon and the technical nurse stand on the right side of the patient. The first assistant is on the left side of the patient.

Preparation

- Intravenous antibiotics should be given prior to skin incision.
- Octreotide administration depends on surgeon preference.
- Prophylactic low molecular weight heparin administration before operation is planned.
- Surgical drains should be inserted earlier and standard in case of potential vascular resection and reconstruction.

Technique

Pancreatic duodenectomy (PD) is performed using an open or laparoscopic approach. The open approach is the most commonly used approach. The laparoscopic approach is a technically demanding procedure and requires an experienced surgeon. The laparoscopic approach is not recommended for patients with a history of prior abdominal surgeries, or patients with a tumor involving the SMA or the celiac axis. The laparoscopic approach is also not recommended for patients with a tumor involving the portal vein or the stomach. The surgeon should be experienced in laparoscopic pancreatic surgery. The role of an interprofessional team in the management of cancer patients is important.[16]

The technique of pancreaticoduodenectomy is complex and requires a thorough knowledge of the anatomy of the pancreatic head and the surrounding structures. The surgeon should be experienced in the performance of the procedure. The surgeon should be able to recognize the anatomical variations and be able to perform the procedure safely