Postpancreatectomy Complications and Management

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KEYWORDS

• Pancreatic resection • Postoperative complications • Pancreatic fistula
• Delayed gastric emptying • Postpancreatectomy hemorrhage

KEY POINTS

- The incidence of postoperative complications after pancreatectomy remains high, in the range of 30% to 60%.
- The International Study Group of Pancreatic Surgery (ISGPS) derived consensus definitions of major complications, allowing a reliable comparison among different experiences.
- Advances in perioperative care have ushered a paradigm shift from operative to nonoperative complication management, with a reduction of associated mortality rates.

INTRODUCTION

An early surgical tenet used to be, "eat when you can, sleep when you can, and don't operate on the pancreas." For decades, postoperative complications after pancreatic resection have been feared events that spelled disaster, thus hampering the dissemination of what were called "formidable" (high-acuity) procedures. More recently, mortality has decreased to less than 5%, such that indications for pancreatic resections have broadened from pancreatic cancer to now include cystic, neuroendocrine, and other uncommon neoplasms. Yet, these procedures remain associated with substantial postoperative morbidity, ranging from 30% to 60%.[1] The management of complications after pancreatic resection has shifted from an operative to a conservative approach, thanks to the establishment of multidisciplinary teams with high degrees of expertise. In general, the development of high-volume, specialist pancreatic centers has been credited with the dramatic improvement of outcomes after pancreatic

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resection.[2] Nevertheless, postoperative complications often have a profound impact on patient recovery and length of hospital stay and are associated with increased utilization of resources as well as with increased hospital costs.[3] The ISGPS established standardized definitions and clinical grading systems for the most common complications, including pancreatic fistula, postpancreatectomy hemorrhage (PPH), and delayed gastric emptying (DGE).[4–6] In addition to improving the quality of comparative research, these classification systems have enabled unbiased comparisons of intraoperative techniques and management decisions. They have also ushered in risk-assessment and risk-adjustment models. This review focuses on postoperative pancreatic fistula (POPF), DGE, and PPH, with the aim of providing practicing physicians state-of-the art concepts regarding diagnosis and management.

PANCREATIC FISTULA

Definition and Risk Assessment

POPF is the most common complication after pancreatic resection. The 2005 consensus definition of POPF by the International Study Group of Pancreatic Fistula (**Table 1**) has since been used in most of the studies investigating outcome measures in pancreatic surgery.[4,7–9] A recent pooled analysis of these studies showed that the incidence of POPF after pancreaticoduodenectomy (PD) was between 22% and 26%, whereas in distal pancreatectomy it was in excess of 30%.[10] Although POPF occurs more frequently after distal pancreatectomy, it is associated with a lesser average complication burden compared with PD.[11,12] The highest rate of POPF follows middle-segment pancreatectomy, which ranges from 20% to 60%, because of the creation of 2 pancreatic remnants and, thus, 2 potential sites for fistula development.[13] The ISGPF clinical grading system (grades A, B, and C), which was originally developed qualitatively around the concept of clinical severity, was validated in different articles and has been shown to correlate with hospital expenditure.[3] The POPF grading system suffered from the inability to be compared quantitatively.[14] In a North American study, the utilization of a postoperative morbidity index, based on the Modified

Table 1
International Study Group of Pancreatic Fistula definition and grading system

Definition			
Output via an operatively placed drain (or a subsequently placed percutaneous drain) of any measurable volume of drain fluid on or after POD 3, with an amylase content greater than 3 times the upper normal serum value.			
Grading system			
Grade	*A*	*B*	*C*
Clinical condition	Well	Often well	Ill appearing/bad
Specific treatment	No	Yes/no	Yes
Ultrasound/CT scan	Negative	Negative/positive	Positive
Persistent drainage (after 3 wk)	No	Usually yes	Yes
Reoperation	No	No	Yes
POPF-related death	No	No	Possibly yes
Signs of infection	No	Yes	Yes
Sepsis	No	No	Yes
Readmission	No	Yes/No	Yes/No

Data from Refs.[4,7–9]