Advances in the Surgical Management of Resectable and Borderline Resectable Pancreas Cancer

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KEYWORDS

• Resectability • Borderline resectable • Vascular resection
• Aberrant vascular anatomy • Lymphadenectomy • Pancreatic fistula
• Delayed gastric emptying • Palliation

KEY POINTS

- Despite successful surgical resection, recurrence rates remain high and overall survival is less than 20%.
- Advances in cross-sectional imaging and diagnostic modalities such as endoscopic ultrasound have allowed better characterization and selection of patients that will benefit from upfront surgical resection versus neoadjuvant therapy to improve the probability of achieving microscopically negative margins (R0).
- Margin-negative resection is possible in the setting of vascular involvement in borderline resectable and selected locally advanced patients after neoadjuvant therapy with vascular resection and/or reconstruction.
- Although mortality rates in high-volume centers are low, morbidity rates after resection remain significant, and efforts to minimize these complications are important to allow for the expeditious use of adjuvant therapy.

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INTRODUCTION

Pancreatic cancer remains one of the most lethal diseases worldwide. Although surgical resection combined with multimodality therapy affords a significant survival advantage in some patients, the vast majority of patients present with locally advanced (LA) or metastatic disease for which palliation is the only option. For those patients who are candidates for resection, surgical options include a pancreaticoduodenectomy (PD), distal or left pancreatectomy (LP), or total pancreatectomy (TP), depending on the location of tumor within the pancreas.

Although surgical resection was initially associated with significant perioperative mortality, advances in surgical technique and perioperative care have reduced the mortality to the low single digits in high-volume centers.[1,2] In addition, improvements in preoperative imaging modalities have enabled better determination of the extent of disease and have thus allowed for better operative planning and patient selection as well as better standardization of treatment regimens. Nevertheless, perioperative morbidity remains a significant problem and can often result in inadequate administration of appropriate adjuvant therapy. However, even in those patients who undergo successful surgical resection and appropriate adjuvant therapy, 5-year survival rates remain low, ranging from 5% to 15%.[3]

In this review, the current state of surgical management of resectable and borderline-resectable (BR) pancreatic cancer is discussed, focusing on both the technical aspects and the common postoperative complications and their management.

DETERMINING RESECTABILITY

Whether a pancreatic tumor is amenable to surgical intervention is defined by the probability of achieving microscopically negative margins (R0) at the time of resection. Numerous studies have demonstrated a strong correlation between R0 resections and decreased recurrence rates and improved overall survival (OS).[4–12] Accordingly, margin status remains one of the most important predictors of long-term survival in pancreatic cancer.[4,6,13] The status of the resection margin is often cited as a significant predictor of patient outcomes following PD, with the median survival of patients with microscopically positive (R1) resection significantly decreased as compared with those undergoing R0 resection.[10,14,15] However, this is not without some controversy, as some studies do not indicate significant differences in survival between these 2 groups when controlled for other prognostic factors.[10,14,15] Overall, in patients undergoing PD for resectable disease, there is wide variance in the reported R1 resection rates with those rates varying from 20 to more than 80%.[10,14,15] These differences represent differences not only in patient selection and operative technique but also in the identification and analysis of the specimen by pathologists.

Although dependent on what type of resection being performed, margins during pancreatic resection typically include the following:

- Transection margins
  - Pancreatic neck margin
  - Common bile duct (CBD)/hepatic duct (CHD) margin
  - Distal stomach/proximal duodenum
- Circumferential margins
  - Anterior pancreatic margin
  - Posterior pancreatic margin

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