Definition and Management of Borderline Resectable Pancreatic Cancer

Jason W. Denbo, MD, Jason B. Fleming, MD*

KEYWORDS

• Borderline resectable pancreatic cancer • Definitions • Management
• Pancreatic ductal adenocarcinoma

KEY POINTS

- Pretreatment evaluation of patients can aid in accurate communication and treatment planning for patients with borderline resectable pancreatic cancer; many patients have technically resectable tumors but are not adequate candidates for surgery.
- Imaging using contrast-enhanced computed tomography is necessary to stage the patient and evaluate extrapancreatic extent of the primary tumor.
- Even though small variations in the definition of borderline resectable tumors exist, the surgeon remains responsible for the complete and safe resection of the primary tumor.
- Safe surgical resection requires detailed preoperative knowledge of pertinent vascular anatomy, careful retroperitoneal dissection, and vascular isolation before vascular resection if necessary.

INTRODUCTION

Recent genetic studies have shown that initial clinical evaluation of pancreatic ductal adenocarcinoma (PDAC) occurs very late in the natural history of the disease,[1] because only 10% to 20% of patients present with surgically resectable disease.[2–5]

Nevertheless, the possibility of a potentially curative surgical resection provides a powerful impetus toward surgical resection of all possible patients. The impetus must be governed by the discipline and insight necessary to perform a safe and oncologically effective pancreatic resection, which is just one part of a multidisciplinary effort engineered to achieve long-term patient survival.

Over the last several decades, particularly at high-volume centers, the postoperative mortality following pancreaticoduodenectomy (PD) has decreased from 30% to 1%.[6] However, despite these advances in surgical safety, patients with PDAC have

Disclosure: The authors have nothing to disclose.
Department of Surgical Oncology, The University of Texas MD Anderson Cancer Center, 1400 Pressler Street, Unit 1484, Houston, TX 77030, USA
* Corresponding author.
E-mail address: jbflemin@mdanderson.org

Surg Clin N Am 96 (2016) 1337–1350
http://dx.doi.org/10.1016/j.suc.2016.07.008 surgical.theclinics.com

not benefited from improved long-term survival when surgery is used as initial therapy.[3,6–8] Furthermore, despite multiple trials showing a survival benefit with adjuvant therapy,[7,9–11] up to 47% of patients treated with up-front surgical resection fail to receive any adjuvant therapy,[12] usually because of delayed postoperative recovery or early disease recurrence.[13,14] These pitfalls of surgery as primary therapy are amplified in borderline resectable (BR) patients for whom careful staging, meticulous patient evaluation, and preoperative therapy are necessary to identify the subset of patients most likely to benefit from the aggressive surgical procedures necessary for complete surgical resection.

IDENTIFICATION OF BORDERLINE RESECTABLE PATIENTS

Any patients with PDAC evaluated by a pancreatic surgeon may require a high-risk surgical procedure that offers the only chance of cure. A new diagnosis of PDAC is often made in patients with multiple underlying medical conditions of variable significance with respect to the risks of pancreatectomy. This high-stakes clinical scenario mandates that the surgeon uses an organized approach to ensure a thorough and efficient initial evaluation. The anatomic relationship of the tumor and critical vessels as determined by a pancreas protocol computed tomography (CT) scan is of crucial significance, but other nonanatomic factors must also be evaluated, such as suspicion for extrapancreatic disease, comorbidities, and functional status. Using this approach, the whole patient and not just tumors are classified as potentially resectable or borderline candidates for surgical resection of the primary tumor.

Our center has developed a systematic approach in which all patients with localized PDAC receive a physical examination, a review of laboratory studies, and radiographic imaging as part of a comprehensive evaluation in a surgical clinic. These data are then collated using a system denoted by the acronym ABC in which A refers to tumor anatomic considerations for surgery, B to cancer biology or stage; and C to patient condition or performance status and fitness for surgery (**Fig. 1**). In the course of treatment planning and communication across our multidisciplinary care team, patients are classified as clinically resectable (CR) or BR using the common nomenclature BR-A, BR-B, or BR-C.[15,16] BR-A patients have no major comorbidities, no clinical findings that are suspicious for extrapancreatic disease, and meet anatomic imaging criteria for a BR tumor, as outlined later. BR-B patients have no major comorbidities or anatomic imaging criteria for a borderline resectable tumor, and have clinical findings suspicious for extrapancreatic disease: (1) indeterminate liver lesions, (2) serum carbohydrate antigen 19-9 (CA19-9) level greater than or equal to 1000 U/mL in the setting of a normal bilirubin level, or (3) biopsy-proven involvement of regional lymph nodes. BR-C patients are advanced in age ($\geq$80 years old) or possess severe comorbidities requiring extensive evaluation or optimization, or depressed performance status (Eastern Cooperative Oncology Group [ECOG] $\geq$2). They may or may not have clinical findings suspicious for extrapancreatic disease.

In practice, the fitness of each patient for pancreatic surgery is evaluated first (see **Fig. 1**). Patients who are too frail for surgery secondary to uncorrectable comorbidities do not need to undergo extensive evaluation for surgical resection or consideration for preoperative therapy because surgical resection will not be the end result. These patients can therefore be efficiently triaged for palliative therapy or supportive care. If the patient is not currently fit for surgery, but has a potentially reversible condition, then medical optimization or prehabilitation during preoperative therapy is the goal. These patients are referred to as BR-C and are generally older (median age, 75 years) with a higher ECOG status (44% ECOG 2) usually secondary to