

## **Pancreatico-Duodenectomy for Pancreatic Ductal Adenocarcinoma: from Artery-First Approaches to TRIANGLE Operation**

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### **Abstract**

Pancreatico-duodenectomy (PD) is the single hope for long-term survival in a patient with pancreatic head ductal adenocarcinoma (PDAC). Unfortunately, even after curative intent PD, the long-term survival of patients with PDAC remains under expectations, with high recurrence rates, including the loco-regional ones. Positive resection margins after resection of PDAC are frequent, and they have a detrimental effect on both recurrence and long-term survival rates, particularly the R1 (direct) ones, toward the mesopancreas. In the last years, there were made increased efforts by surgeons to introduce in clinical practice several technical refinements to the standard technique of PD better to resect the tumor, including an accurate lymph node dissection, hoping to increase the rate of negative resection margins, to decrease local recurrence rates and to improve prognosis. Furthermore, to extend the number of patients with resectable disease, a few surgical techniques were also intended to convert to resectability the patients with the regional disease (i.e., anatomical borderline resectable and locally advanced PDAC) in the context of multimodal therapies, particularly neoadjuvant therapies. With this, we briefly discuss a few technical refinements addressing the resection time of PD, like the artery-first approaches and the Triangle operation. Both surgical techniques aim for better clearance of the retroperitoneal space for nerves, lymphatic nodes, and vessels, including total mesopancreas excision.

**Key words:** pancreatico-duodenectomy, pancreatic ductal adenocarcinoma, artery-first approach, TRIANGLE operation, outcomes