

Total Mesopancreas Excision (TMpE) “The Useful Surgery” for the Radical Treatment of Pancreatic Ductal Adenocarcinoma (PDAC)

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According to 2024 WHO data, pancreatic cancer represent the sixth leading cause of cancer-related death worldwide, with approximately 511,000 new cases diagnosed and an incidence rate increase of approximately 3.2%.

Compared to the recent past, the prevalence of this tumor has increased to the sixth decade of life. Forecasts for 2030 in the USA place pancreatic cancer as the second leading cause of cancer-related death [1].

The poor prognosis of pancreatic cancer is due any factors: 1/3 of patients, at the time of diagnosis, present a locally advanced disease; the overall 5-year survival of operated patients is estimated to be around 7% - 10% and reaches 35% only in tumors in the initial stage the limited number of cases with early-stage tumors (localized, resectable) susceptible to treatment, estimated at around 20% of cases is associated with the high incidence of short-term recurrence, valued to 80% within the first two years [2,3].

For this reason, many authors, even after surgery defined as radical in intent, has judged any surgical treatment as "futile" believing that the early metastatic diffusion of pancreatic cancer depends mainly on its biological aggressiveness, rather than on radical surgical treatment even in so-called localized and resectable tumors [4,5].

In this regard, other authors have wanted to highlight that the T1 – T2 stage of localized and resectable pancreatic tumor, ascertained only on the basis of anatomical-radiological criteria, is not able to define with certainty the real pathological stage of the tumor and that there are histo-pathological and bio-molecular parameters of the neoplastic cells of PDAC which, associated with the presence of some genetic risk factors, are able to assign to the tumor

a strong biological aggressiveness, not definable with simple imaging diagnostics and which are at the basis of the early development of recurrences [2,6,7].

However, if we analyse the site of recurrence after duodenopancreatectomy, we can see that in half of the cases, the most frequent site is found in the retropancreatic tissue corresponding to the posterior margin of resection or in the pancreatic bed [8-14].

Local recurrence in this site therefore finds little justification with the declared biological aggressiveness of the circulating neoplastic cells which, although present in a percentage not exceeding 15% in localised tumours, could be the basis of distant diffusion rather than in the local site of excision, thus leading to the hypothesis that local recurrence in the first 12 months, rather than on an aggressive tumour biology, depends much more on the type of intervention carried out with a high probability of R1 [15].

In fact, as is known, R1 resection margins are the basis of a worse prognosis and therefore of a reduced survival, compared to cases with R0 resection margins [16,17].

For all these reasons, we believe that a radical resection of head pancreatic cancer cannot ignore the complete excision of the mesopancreas (TMpE) and that only this procedure, as originally described by, ensures the removal of all the adipose tissue rich in lymphatics, nerves and vessels, placed in contact with the posterior surface of the ventral pancreas, in the "triangle" delimited by the medial margin of the superior mesenteric artery, the hepatic artery and the vena cava [18-20]. Leave this one "in situ" constitutes the most frequent cause of R1 and therefore the major site of recurrence, as demonstrated by numerous studies [10,11,21,22].

Furthermore, the TMpE, as has been demonstrated, necessarily includes the removal of the lymph nodes of stations 16a and 16b which represent another frequent site of metastasis and which should be removed if one wishes to carry out a radical intervention [23,24].

Ultimately, we believe that TMpE and the consequent lymphadenectomy represents the only surgical procedure capable to achieving, in localized and resectable tumors, a complete clearance of the posterior margin with the removal of the lympho-lipomatous tissue which is the site of neurovascular infiltration, allowing for the achievement of a real R0 surgery in 74 – 92% of cases [25-27].

These data are better to those reported after Conventional Surgery (CS), (60% - 68% of cases) and have a favorable impact on DFS and OS (median 22.5 months TMpE vs. 19.9 months CS) [15,28,29].

In conclusion, we as convinced supporters of this procedure, unlike Crippa et al. [4], can assign the term "useful surgery" to this radical surgical treatment of localized pancreatic head cancer [30,31].

The author declare that they have no conflict of interest.

References

- Rahib, L., Smith, B. D., Aizenberg, R., Rosenzweig, A. B., Fleshman, J. M., & Matrisian, L. M. (2014). Projecting cancer incidence and deaths to 2030: the unexpected burden of thyroid, liver, and pancreas cancers in the United States. *Cancer research*, 74(11), 2913-2921.
- Nishio, K., Kimura, K., Amano, R., Yamazoe, S., Ohira, G., Nakata, B., ... & Ohira, M. (2017). Preoperative predictors for early recurrence of resectable pancreatic cancer. *World journal of surgical oncology*, 15(1), 16.
- Shin, K. I., Yoon, M. S., Kim, J. H., Jang, W. J., Leem, G., Jo, J. H., ... & Bang, S. (2024). Long-Term Outcomes of Neoadjuvant Therapy Versus Upfront Surgery for Resectable Pancreatic Ductal Adenocarcinoma. *Cancer medicine*, 13(22), e70363.
- Crippa, S., Malleo, G., Mazzaferro, V., Langella, S., Ricci, C., Casciani, F., ... & Cucchetti, A. (2024). Futility of up-front resection for anatomically resectable pancreatic cancer. *JAMA surgery*, 159(10), 1139-1147.
- Park, W., Chawla, A., & O'Reilly, E. M. (2021). Pancreatic cancer: a review. *Jama*, 326(9), 851-862.
- Barugola, G., Partelli, S., Marcucci, S., Sartori, N., Capelli, P., Bassi, C., ... & Falconi, M. (2009). Resectable pancreatic cancer: who really benefits from resection?. *Annals of surgical oncology*, 16(12), 3316-3322.
- Rishi, A., Goggins, M., Wood, L. D., & Hruban, R. H. (2015, February). Pathological and molecular evaluation of pancreatic neoplasms. In *Seminars in oncology* (Vol. 42, No. 1, pp. 28-39). WB Saunders.
- Gockel, I., Domeyer, M., Wolloscheck, T., Konerding, M. A., & Junginger, T. (2007). Resection of the mesopancreas (RMP): a new surgical classification of a known anatomical space. *World journal of surgical oncology*, 5(1), 44.
- Menon, K. V., Gomez, D., Smith, A. M., Anthoney, A., & Verbeke, C. S. (2009). Impact of margin status on survival following pancreatoduodenectomy for cancer: the Leeds Pathology Protocol (LEEPP). *HPB : the official journal of the International Hepato Pancreato Biliary Association*, 11(1), 18-24.
- Gaedcke, J., Gunawan, B., Grade, M., Szöke, R., Liersch, T., Becker, H., & Ghadimi, B. M. (2010). The mesopancreas is the primary site for R1 resection in pancreatic head cancer: relevance for clinical trials. *Langenbeck's archives of surgery*, 395(4), 451-458.
- Campbell, F., Cairns, A., Fraser, D., (2019). Datasets for Histopathological Reporting of Carcinomas of the Pancreas, Ampolla of Vater and Common Bile Duct, The Royal College of Pathologists.
- McIntyre, C. A., Zambirinis, C. P., Pulvirenti, A., Chou, J. F., Gonen, M., Balachandran, V. P., ... & Allen, P. J. (2020). Detailed Analysis of Margin Positivity and the Site of Local Recurrence Following Pancreaticoduodenectomy. *Annals of surgical oncology*, 28(1), 539.
- Kalisvaart, M., Broadhurst, D., Marcon, F., Pande, R., Schlegel, A., Sutcliffe, R., ... & Roberts, K. (2020). Recurrence patterns of pancreatic cancer after pancreatoduodenectomy: systematic review and a single-centre retrospective study. *HPB*, 22(9), 1240-1249.
- Nagakawa, Y., Nakagawa, N., Takishita, C., Uyama, I., Kozono, S., Osakabe, H., Suzuki, K., Nakagawa, N., Hosokawa, Y., Shirota, T., Honda, M., Yamada, T., Katsumata, K., & Tsuchida, A. (2021). Reconsideration of the Appropriate Dissection Range Based on Japanese Anatomical Classification for Resectable Pancreatic Head Cancer in the Era of Multimodal Treatment. *Cancers*, 13(14), 3605.
- Fernandes, E. D. S. M., Strobel, O., Girão, C., Moraes-Junior, J. M. A., & Torres, O. J. M. (2021). What do surgeons need to know about the mesopancreas. *Langenbeck's Archives of Surgery*, 406(8), 2621-2632.
- Delpero, J. R., Bachellier, P., Regenet, N., Le Treut, Y. P., Paye, F., Carrere, N., Sauvanet, A., Autret, A., Turrini, O., Monges-Ranchin, G., & Boher, J. M. (2014). Pancreaticoduodenectomy for pancreatic ductal adenocarcinoma: a French multicentre prospective evaluation of resection margins in 150 evaluable specimens. *HPB : the official journal of the International Hepato Pancreato Biliary Association*, 16(1), 20-33.
- Weyhe, D., Obonyo, D., Uslar, V. N., Stricker, I., & Tannapfel, A. (2021). Predictive factors for long-term survival after surgery for pancreatic ductal adenocarcinoma: Making a case for standardized reporting of the resection margin using certified cancer center data. *PloS one*, 16(3), e0248633.
- Adham, M., & Singhirunnusorn, J. (2012). Surgical technique and results of total mesopancreas excision (TMpE) in pancreatic tumors. *European Journal of Surgical Oncology (EJSO)*, 38(4), 340-345.
- Peparini, N., Caronna, R., & Chirletti, P. (2015). The "meso" of the rectum and the "meso" of the pancreas:

- similar terms but distinct concepts in surgical oncology. *Hepatobiliary & Pancreatic Diseases International*, 14(5), 548-551.
20. Hackert, T., Strobel, O., Michalski, C. W., Mihaljevic, A. L., Mehrabi, A., Müller-Stich, B., ... & Büchler, M. W. (2017). The TRIANGLE operation—radical surgery after neoadjuvant treatment for advanced pancreatic cancer: a single arm observational study. *Hpb*, 19(11), 1001-1007.
 21. Xu, J., Tian, X., Chen, Y., Ma, Y., Liu, C., Tian, L., ... & Yang, Y. (2017). Total mesopancreas excision for the treatment of pancreatic head cancer. *Journal of Cancer*, 8(17), 3575.
 22. Conroy, T., Pfeiffer, P., Vilgrain, V., Lamarca, A., Seufferlein, T., O'Reilly, E. M., ... & Ducreux, M. (2023). Pancreatic cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up☆. *Annals of oncology*, 34(11), 987-1002.
 23. Peparini, N., & Chirletti, P. (2012). Clearance of the retropancreatic margin in pancreatic carcinomas: total mesopancreas excision or extended lymphadenectomy?. *European Journal of Surgical Oncology*, 38(11), 1146.
 24. Peparini, N. (2021). Paraaortic dissection in “total mesopancreas excision” and “mesopancreas-first resection” pancreaticoduodenectomies for pancreatic cancer: Useless, optional, or necessary? A systematic review. *Surgical oncology*, 38, 101639.
 25. Kawabata, Y., Tanaka, T., Nishi, T., Monma, H., Yano, S., & Tajima, Y. (2012). Appraisal of a total meso-pancreatoduodenum excision with pancreaticoduodenectomy for pancreatic head carcinoma. *European Journal of Surgical Oncology (EJSO)*, 38(7), 574-579.
 26. Peparini, N., & Chirletti, P. (2013). Mesopancreas: a boundless structure, namely R1 risk in pancreaticoduodenectomy for pancreatic head carcinoma. *European Journal of Surgical Oncology (EJSO)*, 39(12), 1303-1308.
 27. Livani, A., Angelis, S., Skandalakis, P. N., & Filippou, D. (2022). The story retold: the Kocher manoeuvre. *Cureus*, 14(9).
 28. Ono, Y., Inoue, Y., Kato, T., Kobayashi, K., Takamatsu, M., Atsushi, O., Sato, T., Ito, H., & Takahashi, Y. (2023). New approach of circumferential lymph node dissection around the superior mesenteric artery for pancreatic cancer during pancreaticoduodenectomy (with video). *Langenbeck's archives of surgery*, 408(1), 422.
 29. Safi, S. A., David, S., Haeberle, L., Vaghiri, S., Luedde, T., Roderburg, C., ... & Knoefel, W. T. (2025). Most oncological pancreas resections must consider the mesopancreas. *BMC cancer*, 25(1), 200.
 30. Wu, W., Wang, X. A., Wu, X., Li, M., Weng, H., Cao, Y., ... & Peng, S. (2016). Total mesopancreas excision for pancreatic head cancer: analysis of 120 cases. *Chinese Journal of Cancer Research*, 28(4), 423.
 31. Chirletti, P., & Caronna, R. (2017). Role of the total mesopancreas excision in the surgical radical treatment of pancreatic head cancer. *JOP. J Pancreas (Online)*, 18(4), 307-309.