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# Introductory Chapter: Pancreatic Cancer

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## 1. Introduction

Pancreatic cancer remains one of the most lethal solid organ tumors with a poor 5-year survival rate despite current oncological advances. The poor prognosis is related mostly to the late clinical manifestation. Patients usually are diagnosed in an unresectable stage when metastases are present [1]. 85% of the cases of pancreatic cancer are adenocarcinomas [2]. Pancreatic neuroendocrine tumors (NETs) are rare tumors with highly variable behaviors from nearly benign to extremely aggressive [3]. The early and proper diagnosis of pancreatic cancer is of a great importance for the improvement of the overall prognosis. Symptoms are nonspecific and include progressive weight loss, anorexia, abdominal pain and jaundice. The recent advances and increasing sensitivity of the diagnostic techniques such as multi-detector-row computed tomography (MDCT), magnetic resonance imaging (MRI), positron emission tomography (PET) CT and endoscopic ultrasound (EUS) are promising for the early pancreatic cancer detection, staging and differentiation from other pancreatic diseases [4]. The resectability of the tumor depends on the possible infiltration of vessels and lymph nodes as well as distant metastases. The pancreatic cancer is resectable, borderline resectable, locally advanced or metastatic. Prognosis and treatment depend on the stage of pancreatic cancer as treatment strategies include surgery, ablation, chemotherapy, radiation therapy, and palliative care [5].

## 2. Challenging the pancreatic cancer

Less than 20% of the patients with pancreatic cancer are diagnosed in an early resectable stage, achieving a negative resection margin (R0) and a significant survival improvement [5, 6]. An adjuvant chemotherapy is mostly recommended after pancreatic resection [5]. A recent metaanalysis highlights the beneficial effect of neoadjuvant therapy in borderline and locally advanced pancreatic tumors, associated with a decreased tumor-stage, higher rates of R0-resections, lower rates of lymphnode invasion, decreased frequency of lymphatic vessel and perineural invasion [7]. After biopsy confirmation, chemotherapy is the treatment of choice for unresectable pancreatic cancer. Different regimens such as gemcitabine / erlotinib, FOLFIRINOX, gemcitabine /NAB-paclitaxel, gemcitabine/capecitabine, and capecitabine/oxaliplatin (XELOX) are recommended according to the patient's performance status [8]. Palliative care relieves symptoms and ensures optimal quality of life [5]. According to the complications of pancreatic cancer, patients might need endoscopic placement of stents for treating biliary obstruction, pancreatic enzyme replacement therapy for pancreatic exocrine insufficiency, insulin for

treating diabetes mellitus, gastrojejunostomy, enteral stent or PEG tube in case of gastric outlet obstruction, as well as pain management and nutritive support [8–11]. Increasing is the interest on the tumor microenvironment and the arising potential future treatment option. Current clinical trials investigate promising treatment strategies for advanced pancreatic cancer such as stroma modifying drugs, platinum chemotherapy, RAS-directed therapies, immunotherapy with pembrolizumab, immune checkpoint inhibitor combinations or natural killer cells [12–14].

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## References

- [1] Kamisawa T., Wood L.D., Itoi T., Takaori K. Pancreatic cancer. *Lancet*. 2016;388:73-85. doi: 10.1016/S0140-6736(16)00141-0.
- [2] Siegel RL, Miller KD, Jemal A: Cancer statistics, 2015. *CA Cancer J Clin* 2015;65:5-29.
- [3] Ro, C., Chai, W., Yu, V. E., & Yu, R. (2013). Pancreatic neuroendocrine tumors: Biology, diagnosis, and treatment. *Chinese journal of cancer*, 32(6), 312-324. <https://doi.org/10.5732/cjc.012.10295>
- [4] Miura, F., Takada, T., Amano, H., Yoshida, M., Furui, S., & Takeshita, K. (2006). Diagnosis of pancreatic cancer. *HPB : the official journal of the International Hepato Pancreato Biliary Association*, 8(5), 337-342. <https://doi.org/10.1080/13651820500540949>
- [5] Brunner, M., Wu, Z., Krautz, C., Pilarsky, C., Grützmann, R., & Weber, G. F. (2019). Current clinical strategies of pancreatic Cancer treatment and open molecular questions. *International journal of molecular sciences*, 20(18), 4543. <https://doi.org/10.3390/ijms20184543>
- [6] Kamisawa T., Wood L.D., Itoi T., Takaori K. Pancreatic cancer. *Lancet*. 2016;388:73-85. doi: 10.1016/S0140-6736(16)00141-0.
- [7] Schorn S, Demir IE, Reyes CM, Saricaoglu C, Samm N, Schirren R, Tieftrunk E, Hartmann D, Friess H, Ceyhan GO. The impact of neoadjuvant therapy on the histopathological features of pancreatic ductal adenocarcinoma - a systematic review and meta-analysis. *Cancer Treat Rev*. 2017 Apr;55:96-106. doi: 10.1016/j.ctrv.2017.03.003. Epub 2017 Mar 14. PMID: 28342938.
- [8] Qiubo Zhang, Linjuan Zeng, Yinting Chen, Guoda Lian, Chenchen Qian, Shaojie Chen, Jiajia Li, Kaihong Huang, "Pancreatic Cancer epidemiology, detection, and management", *Gastroenterology Research and Practice*, Vol. 2016, Article ID 8962321, 10 Pages, 2016. <https://doi.org/10.1155/2016/8962321>
- [9] Glazer E.S., Hornbrook M.C., Krouse R.S. A meta-analysis of randomized trials: Immediate stent placement vs. surgical bypass in the palliative management of malignant biliary obstruction. *J. Pain Symptom Manag*. 2014;47:307-314. doi: 10.1016/j.jpainsymman.2013.03.013.
- [10] Jeurnink S.M., Van Eijck C.H., Steyerberg E.W., Kuipers E.J., Siersema P.D. Stent versus gastrojejunostomy for the palliation of gastric outlet obstruction: A systematic review. *BMC Gastroenterol*. 2007;7:18. doi: 10.1186/1471-230X-7-18.
- [11] Zhong W., Yu Z., Zeng J.X., Lin Y., Yu T., Min X.H., Yuan Y.H., Chen Q.K. Celiac plexus block for treatment of pain associated with pancreatic cancer: A meta-analysis. *Pain Pract*. 2014;14:43-51. doi: 10.1111/papr.12083.
- [12] Network CGAR Integrated genomic characterization of pancreatic ductal adenocarcinoma. *Cancer Cell*. 2017;32:185-203. doi: 10.1016/j.ccell.2017.07.007.
- [13] Waddell N., Pajic M., Patch A.-M., Chang D.K., Kassahn K.S., Bailey P., Johns A.L., Miller D.K., Nones K., Quek K., et al. Whole genomes redefine the mutational landscape of pancreatic cancer. *Nature*. 2015;518:495-501. doi: 10.1038/nature14169.
- [14] Hessmann E., Johnsen S.A., Siveke J.T., Ellenrieder V. Epigenetic treatment of pancreatic cancer: Is there a therapeutic perspective on the horizon? *Gut*. 2017;66:168-179. doi: 10.1136/gutjnl-2016-312539.