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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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