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## **Relevance of Educational Factors in the Treatment of Pancreatic Cancer**

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# Relevance of Educational Factors in the Treatment of Pancreatic Cancer

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## Abstract:

*Introduction: radical pancreatic resections are the only chance to cure a pancreatic cancer, if the tumor is in an early stage of development. The results of the surgical teams have constantly improved in time, in terms of survival and a good quality of life. Unfortunately, only a small part of the patients benefit from surgical interventions. The causes of this phenomenon are complex, educational factors playing an important role.*

*Material and Methods: 44 patients with pancreatoduodenectomy, operated between 2005 and 2008 were divided in 2 groups. Several parameters were recorded, including age, sex, level of education and place of origin, associated diabetes mellitus, these being studied in relation with the postoperative morbidity and mortality.*

*Results: the morbidity after operation was 65,90%, and the mortality – 6,81%. The level of education, age, socioeconomic status, the presence of diabetes mellitus did not significantly influence the morbidity and the mortality after pancreatoduodenectomy.*

*Conclusions: the postoperative morbidity and mortality are more incidental in small medical centers, but their values are acceptable, if compared with the data from the literature. Excluding the potential patients candidates for radical surgery because they are old or they have poor economic status is not a justified attitude. Education of the patients, medical staff and surgeons is very important and it can raise the number of healed cases and could change the perception on pancreatic cancer.*

## Keywords:

*pancreas, cancer, pancreatoduodenectomy, diabetes.*

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Pancreatic cancer, one of the most lethal human cancers, is a common cause of death in Japan and USA. Pancreatic cancer is notorious because it is rarely diagnosed in early stages, 52% of patients having metastases at diagnosis and 26% showing locoregional invasion. In 2010, there were 43,140 new cases estimated and 36 800 deaths from pancreatic cancer only in the United States of America. Its etiology is still not very clear elucidated, mortality being extremely high. The cancer of the exocrine pancreas is rarely curable, overall survival rate is below 4%. The highest rate of recovery is incidental at those patients whose tumor is localized to the pancreas, but their rate is about 20%. For those patients with tumors smaller than 2 cm that do not exceed the pancreatic capsule and without lymphatic dissemination, the pancreatic resection can offer a chance of survival at 5 years between 18% and 24%. Technical advances in imaging (spiral computed tomography, nuclear magnetic resonance imaging, positron emission tomography, endoscopic ultrasound) and diagnostic laparoscopy can help diagnose and identify situations where curative surgery is of no use. In Romania, according to statistics from 2008, pancreatic cancer is the eighth cause of cancer mortality, annually being reported approximately 2540 deaths. The ratio men/women is 3/2. A less conventional statistics says that this disease kills one Romanian every 3 hours and 27 minutes. Worldwide, it ranks 13 among cancers, but is the 8th leading cause of death from cancer. The incidence is an average of 8-12 new cases per 100,000 population each year. In some regions of the world the incidence of this cancer is very low, an example is India, where are reported two new cases per 100,000 inhabitants every year. Although studies show improved results of pancreatic surgery, pessimism persists regarding the effectiveness of surgical treatment in pancreatic cancer. The best results are obtained in large health centers, which focus the experience of teams involved in this particular type of surgery. This study aims to demonstrate that pancreatic surgery can be practiced also in smaller hospitals, with results comparable to those recommended in the literature. Raising the awareness of patients should contribute to a greater addressability of pancreatic cancer by surgical services.

**Materials and methods:** 44 patients were studied. They underwent a type of pancreatic resection (cephalic duodenopancreatectomia) in two centers with a relatively low-volume of these type of interventions. Thus, the first group included 32 patients

operated in Romania (Bucharest) (32 consecutive patients who underwent cephalic duodenopancreatectomie with pancreatogastroanastomosis), the second study group consisting of 12 patients were operated in a territorial hospital in France, their duodenopancreatectomia being followed by pancreaticojejunoanastomosis. The 44 patients were operated between 2005-2008. For each patient several preoperative factors were registered (age, sex, place of origin, weight, alcohol consumption, smoking, presence of diabetes, personal and family history, serum levels of total and direct bilirubin, of albumin and hemoglobin), and intra- and postoperative (tumor size, diameter of pancreatic duct, pancreas structure used for anastomosis, operation time, intraoperative blood loss, amylase levels obtained from the drain tubes on second, sixth and tenth day). All postoperative complications were tracked and recorded in detail using precise criteria for the definition of pancreatic fistula, biliary fistula and the gastroenteritis, the stomach evacuation delay, intra-abdominal sepsis and vascular complications. Early postoperative deaths were also recorded (within 30 days of surgery). Relationships between preoperative factors and complications were also studied.

**Results:** Patients in group I had the following characteristics: average age was 54 years, with extremes between 26 and 75 years; there were 17 men and 15 women, sex ratio = 1.13, 18 patients came from urban area, 14 from rural zones, 16 had higher education, 14 secondary and two primary studies; 28.12% of patients were diagnosed with diabetes. Morbidity for group I was  $21/32 = 65.625\%$ . There were three deaths within 30 postoperative days: 9.375%. Group II: average age 63.5 years, with extremes ranging from 16 to 82 years, sex ratio M / F = 1; 8 patients from urban and 4 from rural areas, 3 patients with higher education, 8 with secondary and 1 patient with primary education, 41.67% - diabetes. Morbidity for group II was higher than 100%. For the 44 patients enrolled in both groups, overall morbidity was 86.36%. If we eliminate the minor complications that do not cause an aggravation and do not prolong postoperative hospitalization, the morbidity was 65.90%. No significant statistical results were obtained from analysis of the relationship between sex, age (over 70 years), place of origin, level of education (which reflects the socioeconomic level), presence of diabetes mellitus and early postoperative mortality. Postoperative complications were not influenced by the above mentioned factors. The only statistically significant factor for both groups was the type of pancreatic anastomosis, anastomosis with the

stomach being a protective factor for preventing pancreatic fistula. This is a matter of personal preference of the surgeon, there is no solid evidence to support one or another type of pancreatic anastomosis.

**Discussion:** You may think that because the only treatment that is able to offer real chance of a cure is surgery, most patients with pancreatic cancer are referred for surgical evaluation and resection is indicated, they will also receive it. But reality is different. Only a small proportion of these patients will receive radical surgery. The explanation for this is complex, due to several factors. First of all – the patient. He/she has a real emotional shock when the diagnosis is communicated. The received information is often contradictory. The common belief is that pancreatic cancer is a fatal disease and surgery only shortens the life of the patient. Currently, access to internet search engines is quite easy for those patients interested in learning more about their condition. Depending on the degree of education and understanding of each patient, the image of the disease is generally pessimistic.

Sometimes even the medical personnel, from the family doctor and gastroenterologist to oncologist, influenced by the same pessimism - is responsible for the application of conservative and ineffective treatments, but especially by depriving patients of the possibility of surgery. The patient's education, and also its socioeconomic position, can influence the access to the most modern means of diagnosis and treatment (Fischer, 2007). Thus, an uninformed patient regarding the current possibilities of treatment, can be influenced by the beliefs of relatives and medical auxiliary staff. Often, patients with pancreatic cancer in a curable stage, which can be resected, end up being operated in hospitals that are not specialized in pancreatic surgery, where usually palliative interventions, biliary drainage for jaundice remission are performed. The situation can be easily demonstrated by studying operators lists in most surgical services in small hospitals. Thus, there are numerous records of diagnosis: cefalopancreatic tumor, secondary mechanical jaundice and as an intervention one can usually find only a biliodigestiv extension. It is true that only a small percentage of patients can receive a curative resection, but this should not cancel the effort of an accurate diagnosis. An interesting study in the United States of America (Bilimoria et al, 2007) aims to find out what percentage of patients

diagnosed with pancreatic cancer received curative resection. Thus, using the National Cancer Data Base of the U.S., in the period 1995-2004, 9559 patients with potentially resectable pancreatic tumors were identified. They were classified in stage I according to the TNM classification: T1N0M0 and T2N0M0, ie small tumors confined to the pancreas without invasion of locoregional lymph nodes and without distant metastases. The study sought to identify factors that may predict failure to surgical treatment. The results were striking: 71.4% of patients with clinical stage I tumors did not benefit from surgery, 6.4% were excluded because of comorbidities, 4.2% refused surgery, 9.1% were excluded due to old age and to 38.2% of patients with potentially resectable tumors was indicated "not offered surgery." To 13.5% of cases the reasons were unknown. From 28.6% of those patients who received surgery, only 4% had unresectable tumors. For patients in the United States is less likely to benefit from surgery the following categories: those older than 65, African-American population, patients in Medicare and Medicaid systems, but especially patients with low annual incomes and lack of education.

Other situations where the probability of granting a curative surgical treatment is reduced are those in which patients consulted local surgical services with a relatively low volume of cases. Another population study (Cress et al, 2006), based on the State of California Cancer Registry showed that only 35% of patients with localized tumors benefited from pancreatic resections. The hypothesis of two american authors (Riall, Lillemoe, 2007) is that there are two main reasons why so great a number of patients do not benefit from surgery: first, that patients may not even be evaluated by a surgeon due to a negative perception of oncologists and gastroenterologists. According to preliminary data, only 75% of patients with limited locoregional pancreatic cancer surgery are evaluated. Secondly, these patients are consulted by a surgeon without experience in pancreatic surgery. The latter situation justifies the recommendation to send these patients to specialized centers, which report the results, especially in terms of short and long term survival. Based on data from these studies, taking into account the fact that Romania already has a tradition of pancreatic surgery in some universities, we can conceive a minimal standard of care for patients with locoregional pancreatic cancer.

This standard consists of three elements: (1) a quality imaging, which may be a 3D CT examination with protocol pancreatic or magnetic

resonance imaging, (2) an evaluation by a qualified surgeon, experienced in pancreatic surgery and (3) an evaluation by an oncologist (Townsend, 2007). The introduction of this standard of care will allow on the one hand awareness among medical staff of the importance of establishing a complete diagnosis and the possibility of granting a curative surgery, on the other hand it will ensure that patients could go to specialized surgical centers. In practice, this could be achieved by introducing the obligation to complete, when reporting the cases to the National Cancer Registry, the related fields - diagnostic imaging and the consult of pancreatic surgeon. Of course, this theoretical recommendation to follow this protocol can not compensate for lack of appropriate funding for the system. Imaging and hospitalization in large centers require considerable financial efforts that patients from precarious socioeconomic strata can not support.

In terms of education, three aspects can be identified: patient education - as demonstrated by the cited studies, the higher the education level of patients, significantly higher is the chance to benefit from modern means of investigation and specialized treatment, compared to patients with low education. Positive results regarding the improvement in survival from pancreatic cancer after radical interventions have to be popularized, to reach the main beneficiaries of these interventions. In other words, they must go beyond the strict literature and be presented to the public (which still receives information about the lethality of the disease that affects even well known figures of the public life). The education of medical staff - it is true that compared with other diseases, pancreatic cancer is a rare diagnosis. It is difficult to change the mentality, but just by introducing protocols such as exemplified above we can hope for a change among health professionals. An informed family doctor can be aware of the need for the 3 elements in order to offer a proper care of a patient with pancreatic tumor (precise diagnosis, advice from a specialized surgeon and an oncological consult) and may contribute in favour of the patient to receive radical surgery. The education of the surgeon – although it seems obvious, its role in determining the therapeutic strategies is perhaps the most important element. A surgeon specialized in pancreatic resections, in tracking and treating the possible complications, is able to decide and establish the proper course of action

for each operation. A surgeon without a specialized training in this area, which is not supported by a qualified team (anesthesiologist, radiologist, pathologist, oncologist) will still have an important role for the patient, and we identify two possible factors. First, the surgeon may register negative results with radical interventions, that's why he could propose instead a "smaller" intervention in order to improve the patient's quality of life. It should be noted that even this type of intervention is not exempt from morbidity and mortality. The second type of approach, the desirable one, is to recognize the complexity of surgery and postoperative procedures, but especially of the chance that radical resection may provide healing. Therefore, he can lead more easily the patient to a specialized unit.

**Conclusions:** The study of 44 patients operated in centers not specialized in pancreatic surgery (more than 25 interventions / year) showed that the results are comparable to those in the medical literature; however, the results exceed the values of morbidity and mortality obtained in large centers. There are reasons to deny surgery to elderly patients, or with diabetes associated at diagnosis, as these factors significantly influence the postoperative evolution. If these results are obtained even in small hospitals, patients should be encouraged to appeal to radical surgical intervention.

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