ABSTRACT - Background: Pancreatic cancer has a high mortality rate due to late diagnosis and aggressive behavior. The prognosis is poor, with 5-year survival occurring in less than 5% of cases. Aim: To analyze demographic characteristics, comorbidities, type of procedure and early postoperative complications of patients with pancreatic cancer submitted to surgical treatment. Methods: Cross-sectional study with analysis of 28 medical records of patients with malignant tumors of the pancreas in a 62 month. Data collection was performed from the medical records of the hospital. Results: Of the total, 53.6% were male and the mean age was 60.25 years. According to the procedure, 53.6% was submitted to duodenopancreatectomy the remainder to biliodigestive derivation or distal pancreatectomy. The ductal adenocarcinoma occurred in 82.1% and 92.9% of tumors were located in the pancreatic head. Early postoperative complications occurred in 64.3% of cases and the most prevalent was intra-abdominal abscess (32.1%). Among duodenopancreatectomies 77.8% had early postoperative complications. Conclusion: Its necessary to encourage early detection of tumors of the pancreas to raise the number operations with curative intent. Refinements in surgical techniques and surgical teams can diminish postoperative complications and, so, operative morbimortality can also decrease over time.

INTRODUCTION

The incidence of pancreatic cancer in the United States is 13.6 per 100,000 in men and 10.7 per 100,000 in women. In Brazil, this disease is responsible for about 2% of all diagnosed cancers and 4% of all cancer deaths. The prognosis is poor, with a 5-year survival of less than 5%.

Ductal adenocarcinoma is preferentially localized to the head of the organ, followed by the body and tail. The treatment of choice is surgical, although not all patients are candidates for this kind of treatment, in which postoperative complications occur in 33.6%, most commonly due to infections (13.8%) followed by pleural effusion (9.8%).

Patients with pancreatic cancer have been studied and observed over a long period of time, and these studies report an increasing incidence of the disease. However, there is also a study reporting a decline. In any event, the prognosis is bleak, but with improved long-term survival.

Thus, the objective of this study was to analyze the demographic characteristics, comorbidities, type of surgical procedure, and early postoperative complications in patients with pancreatic cancer undergoing surgery.
METHODS

This cross-sectional study was performed at the General Surgery Service of the Hospital Governador Celso Ramos, Florianópolis, SC, Brazil and approved by the Committee for Ethics in Research at the hospital.

The medical records of 28 patients, who underwent surgical treatment for pancreatic tumors between January, 2008 and February, 2013, were analyzed. The patient charts were obtained from the Medical Archive Service as well as hospital electronic records. The data were recorded on a data collection instrument built exclusively for this study, containing biological and clinical variables pertaining to tumor and postoperative characteristics. All charts of patients suffering from pancreatic cancer and subjected to surgical treatment of any kind were included in the study, and those who received surgical treatment for peritoneal carcinomatosis or those with insufficient chart data were excluded.

Results were entered into the Microsoft Excel Program (OU Epi-DATA) and exported to SPSS 16 (Statistical Package for the Social Sciences 16). Data were analyzed and described as absolute and relative frequencies. The Chi-square test or Fisher’s exact test was utilized to test for homogeneity of proportions. The significance level was set to a value of p<0.05.

RESULTS

The medical records of 28 patients were analyzed. Fifteen (53.6%) were men. The average age was 60.25 years old (39-89). Weight varied between 44 and 90 kg, with a mean value of 64.8 kg. Three types of surgical procedure were studied.

The majority of patients (53.6%) underwent duodenopancreatectomy. Biliodigestive derivations, for palliative treatment, were performed in 39.3%. In both groups the neoplasms were localized to the head of the pancreas. In 7.1% of the patients, pancreatectomy of the tail and body was performed, since the neoplasm was localized to the body/tail.

Comorbidities of the participants, smoking, diabetes mellitus, alcoholism and systemic arterial hypertension were studied (Table 1).

TABLE 1 – Lifestyle factors and associated comorbidities

| Variable               | N  | %    |
|-----------------------|----|------|
| Smoking               |    |      |
| Smoker                | 07 | 25.0 |
| Non-smoker            | 15 | 53.6 |
| Ex-smoker             | 06 | 21.4 |
| Diabetes mellitus     |    |      |
| Yes                   | 09 | 32.1 |
| No                    | 19 | 67.9 |
| Alcoholism            |    |      |
| Yes                   | 06 | 21.4 |
| No                    | 22 | 78.6 |
| Arterial hypertension |    |      |
| Yes                   | 11 | 39.3 |
| No                    | 17 | 60.7 |
| Other                 | 14 | 50.0 |

The most common early surgical complications were intra-abdominal abscesses (32.1%), followed by delayed gastric emptying (25.0%), and pancreatic fistulas (21.4%). Male patients experienced 55.6% of all early postoperative complications. The diabetics experienced 44.4% of the complications, and smokers, 33.3% (Table 4).

Among patients undergoing duodenopancreatectomies, biliodigestive derivations, and body-tail pancreatectomies, 77.8%, 16.7%, and 5.6% showed complications, respectively. Diabetes mellitus was associated with the following postoperative complications: fistulas (the three types studied), infections (sepsis, surgical wound infections, and intra-abdominal abscesses), delayed gastric emptying and renal complications. Smoking was associated with surgical reintervention, fistulas and respiratory complications, and asthma was associated with fistulas (Table 6).

The tumor characteristics analyzed were histological type, T stage and N (lymph node) stage (Table 2).

Values of the tumor marker CA 19-9 were collected from 24 patients. The analysis demonstrated that 50% of the patients had values ≤37 U/ml; 20.8%, between 37.1 and 369.9 U/ml; 29.2%, ≥370 U/ml, and 14.2% had no information concerning the marker. The values varied between 1.2 and 84476.5 U/ml.

**TABLE 2 – Tumor characteristics**

| Variable               | N  | %    |
|-----------------------|----|------|
| Histological type     |    |      |
| Ductal adenocarcinoma | 23 | 82.1 |
| Acinar carcinoma      | 01 | 3.60 |
| Cystic neoplasm       | 01 | 3.60 |
| Endocrine neoplasm    | 02 | 7.10 |
| Other                 | 01 | 3.60 |
| Localization of tumor |    |      |
| Head                  | 26 | 92.9 |
| Body/tail             | 02 | 7.10 |
| T stage               |    |      |
| T1                    | 04 | 15.4 |
| T2                    | 04 | 15.4 |
| T3                    | 08 | 30.7 |
| T4                    | 10 | 38.5 |
| N stage               |    |      |
| NX                    | 09 | 33.3 |
| N0                    | 12 | 44.5 |
| N1                    | 06 | 22.2 |

The values varied between 1.2 and 84476.5 U/ml. Concerning the marker. The values varied between 1.2 and 369.9 U/ml; 29.2%, ≥370 U/ml, and 14.2% had no information concerning the marker. The values varied between 1.2 and 84476.5 U/ml.
TABLE 4 – Association of gender and comorbidities with early postoperative complications

| Variable          | Complications | Total | p value |
|-------------------|---------------|-------|---------|
|                   | Yes (%)       | No (%)|         |
| Gender            |               |       |         |
| Female            | 04 (44.4)     | 05 (50.0) | 13 (46.4) | 0.778 |
| Male              | 10 (55.6)     | 05 (50.0) | 15 (53.6) |       |
| Total             | 10 (100)      | 10 (100) | 28 (100) |       |
| Smoker            |               |       |         |
| Yes               | 06 (33.3)     | 01 (10.0) | 07 (25.0) | 0.112 |
| No                | 07 (38.9)     | 08 (80.0) | 15 (53.6) |       |
| Ex-smoker         | 05 (27.8)     | 01 (10.0) | 06 (21.4) |       |
| Diabetes melitus  |               |       |         |
| Yes               | 08 (44.4)     | 01 (10.0) | 09 (32.1) | 0.098 |
| No                | 10 (55.6)     | 09 (90.0) | 19 (67.9) |       |
| Arterial hypertension |         |       | 1.000   |
| Yes               | 07 (38.9)     | 04 (40.0) | 11 (39.3) |       |
| No                | 11 (61.1)     | 06 (60.0) | 17 (60.7) |       |
| Alcoholism        |               |       |         |
| Yes               | 04 (22.2)     | 02 (20.0) | 06 (21.4) | 1.000 |
| No                | 14 (77.8)     | 08 (80.0) | 66 (78.6) |       |

TABLE 5 – Association between tumor characteristics and early postoperative complications

| Variable          | Complications | Total | p value |
|-------------------|---------------|-------|---------|
|                   | Yes (%)       | No (%)|         |
| T Stage           |               |       |         |
| T1                | 04 (23.5)     | -     | 04 (15.4) | 0.018 |
| T2                | 04 (23.5)     | -     | 04 (15.4) |       |
| T3                | 06 (35.4)     | 02 (22.2) | 08 (30.7) |       |
| T4                | 03 (17.6)     | 07 (77.8) | 10 (38.5) |       |
| N stage           |               |       | 0.570   |
| NX                | 06 (33.3)     | 03 (33.4) | 09 (33.3) |       |
| N0                | 09 (50.0)     | 03 (33.3) | 12 (44.5) |       |
| N1                | 03 (16.7)     | 03 (33.3) | 06 (22.2) |       |
| Histological type |               |       | 0.626   |
| Ductal adenocarcinoma | 14 (77.6) | 09 (90.0) | 23 (82.1) |       |
| Acinar neoplasm   | 01 (5.60)     | -     | 01 (3.60) |       |
| Cystic neoplasm   | 01 (5.60)     | -     | 01 (3.60) |       |
| Endocrine neoplasm| 01 (5.60)     | 01 (10.0) | 02 (7.10) |       |
| Other             | 01 (5.60)     | -     | 01 (3.60) |       |
| Location          |               |       | 1.000   |
| Head              | 17 (94.4%)    | 09 (90.0) | 26 (92.9%) |       |
| Body/Tail         | 03 (50.0%)    | 01 (10.0%) | 04 (71.0%) |       |

TABLE 6 – Association between the type of surgery performed and early postoperative complications

| Surgical procedure | Complications | Total | p value |
|--------------------|---------------|-------|---------|
|                    | Yes (%)       | No (%)|         |
| Duodenopancreatectomy | 14 (77.8) | 01 (10.0) | 15 (53.6) | 0.002 |
| Biliogdigestive derivation | 03 (16.7) | 08 (80.0) | 11 (39.3) |       |
| Body/tail pancreatectomy | 01 (5.60) | 01 (10.0) | 02 (7.10) |       |
| Total              | 18 (100)      | 10 (100) | 28 (100) |       |

Cancers in patients undergoing duodenopancreatectomy progressed as far as stage II-B, and T3N1M0 occurred at the highest frequency. When isolated tumors were studied, it was found that the majority (38.5%) were grouped in stage T4. However, when the surgical procedure was analyzed, it was found that the majority of patients underwent duodenopancreatectomy because they were in stages T1-T3, that is, the sum total of the tumors staged in T1-T3 was greater than those staged exclusively in T4, explaining the prevalence of duodenopancreatectomy as the surgical procedure in this study rather than a palliative surgical procedure. Such data are in accordance with other studies that recommend resection up to stage II-B. However, Lefaivre et al. and Abraham et al. demonstrated a similar likelihood of curative surgical operations in their studies, at around 11%.

Smoking is considered responsible for about 20-30% of pancreatic neoplasms in the western population. Lowenfels et al. showed that smokers develop pancreatic cancer between three and four years before non-smokers. The smoking population has a 70% greater risk of developing a pancreatic malignancy than the non-smoking population. To stop or never start smoking is considered a preventive factor.

The incidence of diabetes mellitus is higher in patients with pancreatic cancer, but the relationship between diabetes and cancer is controversial. Some studies indicate that diabetes is a risk factor for the development of pancreatic cancer, while others argue that diabetes could be a manifestation of cancer already in existence. Liao et al. demonstrated that diabetic patients, less than two years after their initial diagnosis, have an increased incidence of pancreatic cancer. However, at longer periods following the diagnosis, patients show no significant difference. Chiari et al. observed that diabetes mellitus can be an early manifestation of pancreatic cancer other than a risk factor.

Preoperative alcoholic participants made up ¼ of the total, but there were no records mentioning the quantity of alcoholic beverages consumed. The International Agency for Research on Cancer published a monograph on the evaluation of carcinogenic risks to humans and concluded that there was insufficient evidence to consider alcohol a risk factor for development of pancreatic cancer. However, Gupta et al. support the occurrence of pancreatic cancer in the subgroup of patients exhibiting excessive alcohol consumption, independently of smoking.

Studies demonstrate a higher incidence of adenocarcinomas in relation to other histological types and localization to the head of the pancreas.

The tumor marker most commonly utilized in the diagnosis and prognosis of exocrine pancreatic cancer is the tumor-associated carbohydrate antigen 19-9 (CA 19-9). Around 70-90% of patients with pancreatic cancer express this marker in a manner sensitive to the stage of the disease. It is not uncommon to find patients with small tumors but normal values of CA19-9. It is thought that the marker is elevated in patients with tumors of 2 cm or less. Kim et al. found that, at its cut-off value of 37 U/ml, its sensitivity and specificity were 76.7% and 87.1%, respectively. Patients with very high levels of CA 19-9 (more than 1000 U/ml) are very likely to have inoperable cancer.

Lermite et al. state that intra-abdominal abscesses are frequently associated with pancreatic and biliary fistulas. Diagnosis of a suspected fistula can be made by means of clinical data and confirmed by biochemical methods and imaging. In the present study, diagnosis of this complication was based solely on clinical observation, because the method used to confirm the diagnosis was not mentioned in the chart records, only the presence or absence of the complication. Therefore, in the diagnosis of a fistula, the characteristics of the clinical data and biochemical methods are important.

DISCUSSION
the drained liquid were taken into account; except in a few cases in which amylase was measured in the drained liquid, no laboratory testing or imaging was used to study this. A digestive fistula was considered one whose liquid contained gastrointestinal secretions. A biliary fistula was considered one whose liquid was yellow-brown in color with crystals in the pancreatic liquid.

Pancreatic fistulas occur in 10-15% of patients subjected to duodenopancreatectomy, in agreement with Lermite et al.15. However, as this complication depends on various factors, there are investigators who report a lower rate. Kamphues et al.14 found them in 1.4% of 442 surgically treated patients and Amico et al.2, in 50% of 54 surgically treated patients. Among the local factors related to the genesis of pancreatic fistulas, the consistency of the pancreatic remnant (soft, normal or hard) and the caliber of the pancreatic ducts are noteworthy. Subjective evaluation of the greater consistency of the pancreas, associated with ductal dilatation, contributed to a lower incidence of pancreatic fistulas.21 In the indicated study, this complication was unrelated to the consistency of the gland or to the type of Anastomosis used (duct-to-mucosa or telescoping of the pancreatic stump).

Delayed gastric emptying is, by definition, persistent gastric stasis requiring nasogastric aspiration for a period of at least 10 days or solid food intolerance for up to 14 postoperative days. Various factors are related to the onset of this complication, notably previous abdominal operations, diabetes, malnutrition and postoperative intra-abdominal complications.12

According to Kamphues et al.14, the most common non-surgical complication was of the cardiopulmonary type, occurring in 12.4% of the patients undergoing duodenopancreatectomy, and surgical reintervention took place in 10.3% of the cases. Already in the study of duodenopancreatectomy, and surgical reintervention type, occurring in 12.4% of the patients undergoing non-surgical complication was of the cardiopulmonary nature.

In the present study, total early postoperative complications came to 64.3%. This observation is at variance with Kamphues et al.14 and in harmony with Rocha et al.26, who obtained values of 33.6 and 58%, respectively. In the study under discussion, 77.8% of the patients who underwent duodenopancreatectomy showed early complications postoperatively; among those subjected to biliodigestive derivation, only 16.7%; and among the remaining patients, who underwent corpocaudal pancreatectomy, 5.6%. Theoretically, one would expect to find a higher frequency of complications in patients undergoing duodenopancreatectomy when compared to those subjected to corpocaudal pancreatectomy. In the former case, the procedure is technically more complex, resulting in a longer period in surgery and the eventual need for a blood transfusion. In the latter case, the number of patients with tumors of the pancreatic body and tail was decidedly small, when compared with tumors of the head (based on the frequency of malignant tumors localized to the pancreas), and as a consequence, corpocaudal pancreatectomy was performed only a few times. Perhaps more instances of this procedure would reduce such a difference. A similar explanation may apply to cases in which the patients underwent biliodigestive derivation.

CONCLUSION

There is a need to encourage early detection of pancreatic tumors to increase the number of operations with curative potential. Refinements in surgical techniques and surgical teams could also diminish postoperative complications and thereby decrease operative morbimortality over time.

REFERENCES

1. Abraham A, Al-Refaie WB, Parsons HM, Dudeja V, Vickers SM, Habermann EB. Disparities in Pancreas Cancer Care. Ann Surg Oncol [Internet]. 2013 Abril [acesso em 2013 Maio 15];10434-012. Disponível em: http://www.ncbi.nlm.nih.gov/pubmed/23579872
2. Amico EC, Alves JR, João SA, Guimarães PL, Barreto EJ, Barreto LS, Costa PR, Medeiros JA. Complications after pancreatectomies: prospective study after ISGFP and ISGPS new classifications. Arq Bras Cir Dig. 2013 Jul-Sep;26(3):213-8.
3. Beger HG, Matsuno S, Cameron JL. Diseases of the Pancreas – Current Surgical Therapy. Berlin: Springer, 2008.
4. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Instituto Nacional de Câncer. Coordenação de Prevenção e Vigilância de Câncer: Estimativas 2008: Incidência de Câncer no Brasil. Rio de Janeiro: INCA; 2007. 94p. [acesso 2011 Nov 07]. Disponível em: http://bvsms.saude.gov.br/bvs/publicacoes/estimativa_incidencia_cancer_2008.pdf
5. Chari ST, Leibson CL, Rabe KG, Timmons LJ, Ransom J, de Andrade M, Petersen GM. Pancreatic cancer-associated diabetes mellitus: prevalence and temporal association with diagnosis of cancer. Gastroenterology. 2008;134(1):95-101.
6. Cronin-Fenton DP, Frichsen R, Mortensen FV, Dikinis S, Norgaard M, Jacobsen J. Pancreatic cancer survival in central and northern Denmark from 1998 through 2009: a population-based cohort study. 2011;Clin.Surg 19:25.
7. Dragovich T, Harris JE. Pancreatic cancer. Updated: Sep 13, 2011. [acesso 2011 Nov 07]. Disponível em: http://emedicine.medscape.com/article/280605-overview
8. Eloubeidi MA, Desmond RA, Wilcox CM, Wilson RJ, Manchikalapati P, Fouad MM, Eilmoum J, Vickers SM. Prognostic factors for survival in pancreatic cancer: a population-based study. Am J Surg. 2006;192(3):322-9.
9. Guarita DR, Felga GEG, Cunha JEM, Rocha MS. Tumores do pâncreas. In: Autores. Clínica médica, vol 4: doenças do aparelho digestivo, nutrição e doenças nutricionais. SP – Barueri: ed. Manole, 2009.
10. Gupta S, Wang F, Holly EA, Bracci PM. Risk of pancreatic cancer by alcohol dose, duration, and pattern of consumption, including binge drinking: a population- based study. Cancer Causes Control. 2010;21(7):1047-59.
11. Hartwig W, Hackert T, Himz U, Gluth A, Bergmann F, Strobel O, Büchler MW, Werner J. Pancreatic Cancer Surgery in the New Millennium Better Prediction of Outcome. Ann Surg. 2011;254(2):311-9.
12. Henegouwen MB, van Gulik TM, DeWit LT, Allema JH, Rauws EAJ, Obertop H, Gouma DJ. Delayed gastric emptying after standard pancreaticoduodenectomy versus pylorus-preserving pancreaticoduodenectomy: an analysis of 200 consecutive patients. J Am Coll Surg. 1997;185(4):388-95.
13. Howlader N, Noone AM, Krapcho M, Neyman N, Aminou R, Waldron W, Altekruse SF, Kosary CL, Ruhl J, Tatalovich Z, Cho H, Mariotto A, Eisner MP, Lewis DR, Chen HS, Feuer EJ, Cronin KA, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2008. National Cancer Institute, Bethesda, MD, based on November 2010 SEER data submission, posted to the SEER web site, 2011. [acesso 2011 Nov 06]. Disponível em: http://seer.cancer.gov/csr/1975_2005/
14. Kamphues C, Bova R, Schricke D, Hippler-Benschmidt M, Klauschen F, Stenzinger A, Seehofer D, Glanemann M, Neuhaus P, Bahra M. Postoperative Complications Deteriorate Long-Term Outcome in Pancreatic Cancer Patients. Ann Surg Oncol [Internet]. 2011 Abril [acesso em 2011 Ago 30];2041-4. Disponível em: http://www.ncbi.nlm.nih.gov/pubmed/21879265
15. Kim HJ, Kim MH, Myung SJ, Lim BC, Park ET, Yoo KS, Seo DW, Lee SK, Min YI. A new strategy for the application of CA19-9 in the differentiation of pancreaticobiliary cancer: analysis using a receiver operating characteristic curve. Am J Gastroenterol. 1999;94(7):1941-6.
16. La Torre G, de Waure C, Specchia ML, Nicolotti N, Capizzi S, Bilotta A, Clemente G, Ricciardi W. Does quality of observational studies affect the results of meta-analysis? The case of cigarette smoking and pancreatic cancer. Pancreas. 2009 Apr;38(4):241-7.
17. Lefebvre AC, Maurel J, Boutreux S, Bouvier V, Reimund JM, Launoy JP. Effect of preoperative endoscopic biliary drainage on infectious morbidity after pancreatoduodenectomy: a case- control study. Am J Surg. 2008;195(4):442-6.
19. Liao KF, Lai SW, Li CI, Chen WC. Diabetes mellitus correlates with increased risk of pancreatic cancer: A population-based cohort study in Taiwan. J Gastroenterol Hepatol. 2012;27(4):709-13.

20. Lowenfels AB, Maisonneuve P. Epidemiology of pancreatic cancer. In Beger HG, Matsuno S, Cameron JL. Diseases of the pancreas: current surgical therapy. Germany: ed. Springer-Verlag Berlin Heidelberg. 2008:489-94.

21. Lowenfels AB, Maisonneuve P, Whitcomb DC, Lerch MM, DiMagno EP. Cigarette smoking as a risk factor for pancreatic cancer in patients with hereditary pancreatitis. JAMA. 2001 Jul 11;286(2):169-70.

22. Luke C, Price T, Karapetis C, Singhal N, Roder D. Pancreatic cancer epidemiology and survival in an Australian population. Asian Pac J Cancer Prev. 2009;10(3):369-74.

23. Matheus AS, Montagnini AL, Jukemura J, Jurendini R, Penteado S, Abdo EE, Cunha JEM. Risk factors for pancreatic fistula. Does it have a clinical application for early identification of patients with high risk to develop pancreatic fistula after pancreaticoduodenectomy?. Gastroenterol 2006;130(4) supl2.

24. Molina V, Visa L, Conill C, Navarro S, Escudero JM, Auge JM, Filella X, Lopez-Boado MA, Ferrer J, Fernandez-Cruz L, Molina R. CA 19-9 in pancreatic cancer: retrospective evaluation of patients with suspicion of pancreatic cancer. Tumor Biol, 2012. 33:799–807.

25. Muscat JE, Stellman SD, Hoffmann D, Wynder EL. Smoking and pancreatic cancer in men and women. Cancer Epidemiol Biomarkers Prev. 1997;6(1):15-9.

26. Rocha LCG, Queiroz FL, Eudes Magalhães EA, Santos FAV, Caldeira DAM, Ribas MA. Duodenopancreatectomy: Avaliação dos resultados em 41 pacientes. Rev. Col. Bras. Cir. 2006;33(6):387-92. 27. Secretan B, Straif K, Baan R, Grosse Y, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Freeman C, Galichet L, Cogliano V. A review of human carcinogens—Part E: tobacco, areca nut, alcohol, coal smoke, and salted fish. Lancet Oncol. 2009;10(11):1033-4.

28. Søreide K, Aages B, Møller B, Westgaard A, Bray F. Epidemiology of pancreatic cancer in Norway: trends in incidence, basis of diagnosis and survival 1965-2007. Scand J Gastroenterol. 2010;45(1):82-92.

29. Union for International Cancer Control – UICC. TNM Classification of Malignant Tumours -7th ed. 2010. [acesso em: 2012 Mar 15]. Disponivel em: http://www.uicc.org/resources/tnm

30. Winter JM, Brennan MF, Tang LH, D’Angelica MI, Dematteo RP, Fong Y, Klimstra DS, Jarnagin WR, Allen PJ. Survival after Resection of Pancreatic Adenocarcinoma: Results from a Single Institution over Three Decades. Ann Surg Oncol [Internet]. 2011 Julho [Acesso em 2011 Ago 30];1900-3. Disponivel em: http://www.ncbi.nlm.nih.gov/pubmed/21761104