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Clinicopathological study of 37 cases of gastroduodenopancreatectomies

Estudo clínico-patológico de 37 casos de Gastroduodenopancreatectomias

Estudio clinico patológico de 37 casos de gastroduodenopancreatectomías

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ABSTRACT

Objective: To describe the clinical characteristics of patients who underwent gastroduodenopancreatectomy between 2022 and 2024 at a university hospital, as well as the histopathological findings of their surgical specimens. **Methods:** Biopsy request forms and histopathological reports were reviewed in the digital archives of the Pathology Unit of a university hospital. The information analyzed was: age, sex, frozen section biopsy, histopathological report, margin assessment, lymphatic, blood and neural vascular invasion and tumor size. **Results:** During this period, 37 gastroduodenopancreatectomy surgeries were performed in this hospital, with an average patient age of 58 years (SD=12.6), 27 (72.9%) of which were female and 10 (27.0%) were male. Thirty-two (86.4%) patients had malignant lesions, with the most prevalent histopathological diagnoses being pancreatic ductal adenocarcinoma (21.6%) followed by intestinal type adenocarcinoma (18.9%). Perineural invasion was found in 20 cases (54%) and blood vessel and/or lymphatic invasion in 13 (35%). **Conclusion:** The analysis of data relating to periampullary tumors and patients undergoing gastroduodenopancreatectomy surgery contributes to reinforcing epidemiological knowledge of these conditions, aiming at better patient care.

Keywords: Whipple surgery, Gastroduodenopancreatectomy, Adenocarcinoma periampullary tumors, Ampulla of vater.

RESUMO

Objetivo: Descrever as características clínicas dos pacientes submetidos à cirurgia de gastroduodenopancreatectomia entre 2022 e 2024 em um hospital universitário e os achados histopatológicos das peças cirúrgicas desses pacientes. **Métodos:** Foram avaliados os formulários de solicitação de biópsia e os laudos histopatológicos nos arquivos digitais da unidade de anatomia patológica de um hospital universitário. As informações analisadas foram: idade, sexo, biópsia por congelação, laudo histopatológico, avaliação de margens, invasão linfática, vascular e perineural, e tamanho do tumor. **Resultados:** Durante esse período, foram realizadas 37 cirurgias de gastroduodenopancreatectomia neste hospital, com idade média dos pacientes de 58 anos (DP = 12,6), sendo 27 (72,9%) do sexo feminino e 10 (27,0%) do sexo masculino. Trinta e dois (86,4%) pacientes apresentaram lesões malignas, sendo os diagnósticos histopatológicos mais prevalentes o adenocarcinoma ductal pancreático (21,6%) seguido do adenocarcinoma tipo intestinal (18,9%). Invasão perineural foi observada em 20 casos (54%) e invasão vascular e/ou linfática em 13 (35%). **Conclusão:** A análise dos dados referentes aos tumores periampulares e aos pacientes submetidos à cirurgia de gastroduodenopancreatectomia contribui para reforçar o conhecimento epidemiológico dessas condições, visando a um melhor cuidado ao paciente.

Palavras-chave: Cirurgia de whipple, Gastroduodenopancreatectomia, Adenocarcinoma tumores periampulares, Ampola de vater.

RESUMEN

Objetivo: Describir las características clínicas de los pacientes sometidos a cirugía de gastroduodenopancreatectomía entre 2022 y 2024 en un hospital universitario, así como los hallazgos

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histopatológicos de las piezas quirúrgicas de estos pacientes. **Métodos:** Se evaluaron los formularios de solicitud de biopsia y los informes histopatológicos en los archivos digitales de la Unidad de Anatomía Patológica de un hospital universitario. La información analizada fue: edad, sexo, biopsia por congelación, informe histopatológico, evaluación de márgenes, invasión linfática, vascular y perineural, y tamaño del tumor. **Resultados:** Durante este período, se realizaron 37 cirugías de gastroduodenopancreatectomía en este hospital, con una edad promedio de los pacientes de 58 años (DE = 12,6), siendo 27 (72,9%) del sexo femenino y 10 (27,0%) del sexo masculino. Treinta y dos (86,4%) pacientes presentaron lesiones malignas, siendo los diagnósticos histopatológicos más prevalentes el adenocarcinoma ductal pancreático (21,6%) seguido del adenocarcinoma tipo intestinal (18,9%). La invasión perineural fue observada en 20 casos (54%) y la invasión vascular y/o linfática en 13 (35%). **Conclusión:** El análisis de los datos relacionados con los tumores periampulares y los pacientes sometidos a cirugía de gastroduodenopancreatectomía contribuye a reforzar el conocimiento epidemiológico de estas condiciones, con el objetivo de brindar una mejor atención al paciente.

Palabras clave: Cirugía de whipple, Gastroduodenopancreatectomía, Adenocarcinoma tumores periampulares, Ampolla de vater.

INTRODUCTION

Gastroduodenopancreatectomy (GDP), also known as Whipple surgery, is the surgery of choice for the treatment of periampullary tumors, whether of pancreatic, ampullary, biliary or duodenal origin. One of the most complex procedures among digestive system surgeries, with a high rate of morbidity and mortality, the Whipple surgery consists of removing the head of the pancreas, duodenum, a portion of the common bile duct, the gallbladder and, often, a portion of the stomach. Other indications for GDP include chronic pancreatitis and severe pancreatic trauma (UIJTERWIJK BA, et al., 2024). Contraindications for surgery are related to the morbidity and mortality of the procedure; therefore, individuals with high surgical risk or significant comorbidities may not be candidates for surgery.

Other contraindications for performing GDP include unresectable tumors and metastatic disease (D´CRUZ JR, et al., 2024). Periampullary tumors include neoplasms of pancreatic, ampullary, distal biliary, or duodenal origin. The origin of the tumor is often difficult to diagnose preoperatively. An aggressive surgical resection approach therefore benefits those patients with tumors with a better prognosis (HATZARAS I, et al., 2010). The most common histological types among these tumors are ductal adenocarcinomas of the pancreas, followed by carcinoma of the Ampulla of Vater, carcinoma of the distal bile duct and duodenal carcinoma (HE J, et al., 2014; KAMARAJAH SK, 2018).

Periampullary tumors are not common in the general population, and many patients present to medical services with locally invasive or metastatic disease (KAMARAJAH SK, 2018). Due to the rarity and aggressiveness of these tumors and the narrow indication for GDP, the analysis of epidemiological data relating to these lesions and this surgical procedure is important. Furthermore, thorough histopathological evaluation of GDP specimens is essential for the follow-up of patients diagnosed with malignant tumors in this location. This study aims to evaluate clinical and histopathological data of cases of patients undergoing GDP in a reference university hospital.

METHODS

This is a descriptive study, whose data were collected from the request forms for anatomopathological examinations and histopathological reports obtained from the electronic system of the Pathological Anatomy Unit (UAPAT) of a Universitary Hospital (HU) over a period of 5 years (2020 to 2024). This research was approved by the Human Research Ethics Committee of the Federal University of Rio Grande do Norte (UFRN) (Certificate of Presentation and Ethical Appreciation – CAAE: 82154124.3.0000.5292; Ethics committee opinion number: 7.059.933).

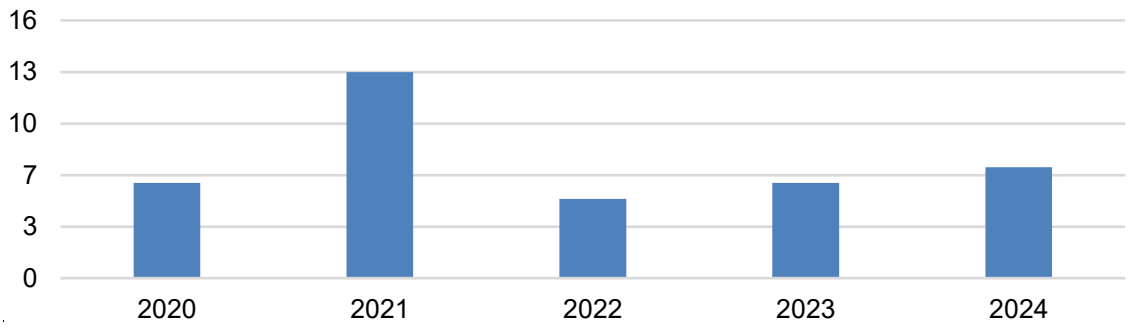
The following information was collected from the electronic files: patient identification (medical record number), sex, age, anatomical location, type of biopsy, clinical diagnosis, Tumor-Node-Metastasis (TNM)

classification, frozen section biopsy and histopathological report. In the histopathological reports, information regarding the agreement between the histopathological reports of the frozen section biopsy and the paraffin examination, degree of differentiation, perineural and vascular invasion, surgical margins and affected lymph nodes were verified.

RESULTS

In the period from January 2020 to December 2024 (5 years), 37 GDP surgical specimens from HUOL were received at UAPAT, making an average of 7.4 (SD = 3.2) surgeries per year, distributed temporally according to (**Figure 1**). Of these patients, 27 (72.9%) were women and 10 (27.0%) were men. The age of the patients ranged from 13 to 80 years, with a mean age of 58 years (SD=12.6). The mean age of women was 57.6 (SD=13.1) years and of men was 59.4 years (SD=10.1).

Figure 1 - Distribution of GDP cases received (2020-2024).



Source: Neuman BAPR and Rocha DAPR, 2025.

Among the cases analyzed, 25(67.5%) underwent frozen section examination. Of these, 22(88%) had concordant results between the frozen section and paraffin examination. Three cases (12%) had inconsistent results, one of which was a false positive and two of which were false negatives. There were no inconclusive cases (inconclusive cases were those in which the report stated “await paraffin results”).

Of the cases with non-concordant diagnostic results between the frozen section and paraffin examination, one of them was performed on a patient with suspected residual neoplasia, which was ruled out in the paraffin examination. Two patients had negative frozen section results for neoplasia and non-visualized neoplasia, whose diagnoses of neoplasia were confirmed in the paraffin exam (**Table 1**).

Table 1 - Data related to the performance of frozen section examination of GDP cases (2020-2024).

Variables	F	%
Performing a freezing examination (n=37)		
Yes	25	67,5
No	12	32,5
Agreement between frozen section and histopathological examinations (n=25)		
Concordant	22	88
Discordant	3	12
Non-concordant histopathological examination results (n=3)		
False positive	1	66,7
False negative	2	33,3
Inconclusive results (n=37)		
Yes	0	0
No	37	100

Note: F - Absolute frequency. **Source:** Neuman BAPR and Rocha DAPR, 2025.

Of the 37 cases studied, 3 cases were operated on for benign disease, 1 case of serous cystadenoma, 1 case of nonspecific chronic duodenitis and 1 case of chronic pancreatitis. Two cases that had a previous diagnosis of malignant disease were diagnosed with no residual neoplasia and chronic pancreatitis, making a total of 5 cases of benign diseases.

In the other 32 (86.4%) GDP cases, malignant neoplasms were confirmed. Regarding the anatomical location of these malignant tumors, 13 (40.6%) were pancreatic tumors, 12 (32.4%) were duodenal papilla tumors (papilla of Vater), 5 (15.6%) were distal bile duct tumors and 2 (5.4%) were of duodenal origin. Regarding the histopathological diagnosis, 27 (72.9%) were periampullary carcinomas, 2 (5.4%) were neuroendocrine tumors, 2 (5.4%) were spindle cell tumors and 1 (3.5%) was a Frantz tumor (**Table 2**).

Table 2 - Distribution of GDP cases regarding the presence of benign and malignant changes and characteristics of malignant changes, 2020-2024.

Variables	F	%
Presence of malignant changes (n=37)		
Yes	32	86,4
No	5	13,6
Benign changes, according to histopathological diagnosis (n=5)		
Serous cystadenoma	1	20
Absence of residual neoplasia/chronic pancreatitis	2	40
Chronic nonspecific duodenitis	1	20
Chronic pancreatitis	1	20
Malignant changes, regarding anatomical location (n=32)		
Pancreatic tumors	13	40,6
Vater's ampoule	12	37,5
Distal bile duct	5	15,6
Duodenum	2	6,2
Malignant changes, according to histopathological diagnosis (n=32)		
Frantz tumor	1	3,5
Pancreatic ductal adenocarcinoma	8	24,1
Adenosquamous carcinoma	1	3,5
Intestinal-type adenocarcinoma	7	20,6
Tubular adenocarcinoma not otherwise specified	1	3,5
Mixed type adenocarcinoma	1	3,5
Pancreaticobiliary ductal adenocarcinoma	5	13,7
Biliary type adenocarcinoma	3	7,7
Poorly differentiated carcinoma	1	3,5
Well-differentiated neuroendocrine tumor Grade 1	2	6,9
Spindle cell neoplasm	2	6,9
Carcinomas, according to anatomical location (n=27)		
Head of the pancreas	10	37
Vater's ampoule	12	44,5
Distal bile duct	5	18,5
Duodenum	0	0

Note: F - Absolute frequency. **Source:** Neuman BAPR and Rocha DAPR, 2025.

In cases of adenocarcinoma of the duodenal ampulla (12 cases), we found 3(25%) of intra-ampullary location, 2(16.6%) of periampullary location and 7(58.3%) of mixed type (intra- and periampullary). The mean size of the masses was 2.9 cm, with a range from 1.0 to 12.0 cm. Of the 12 cases, 5(41.6%) were well differentiated, 5 (41.6%) were moderately differentiated, and 2 (16.6%) were poorly differentiated. Regarding the pathological TNM staging, 4(33.3%) cases were T1, 2(16.6%) were T2 and 6(50%) were T3.

Perineural invasion was identified in 4(33.3%), lymphatic vascular invasion in 3(25%) and blood vascular invasion in 1(8.3%) case. Furthermore, 1(8.3%) case presented bile duct invasion and 8(66.6%) presented lymph node metastases. Surgical margins were free in 100% of cases. Among the pancreatic carcinomas

(n=10), 7(70%) tumors were larger than 2 cm and 2(20%) were larger than 5 cm. In the TNM assessment, 5(50%) tumors were T3, 4(40%) were T2, 1(10%) patients were T1 and no patient was classified as T4.

Regarding the degree of differentiation of the tumors, in 3(30%) of the cases the tumor was well differentiated, in 4(40%) cases it was moderately differentiated and in 3(30%) cases the tumor was poorly differentiated. Perineural invasion was identified in 10 (100%), lymphatic invasion in 7(70%) and blood vascular invasion in 4(40%) cases. Surgical margins were free in 100% of cases. Lymph nodes were involved in 5(50%) cases. Our study identified 5 cases of distal bile duct adenocarcinomas (DBD). This number represents 15.6% of GDPs diagnosed with malignant disease.

Of these, 3(60%) were of the biliary type and 2 (40%) were of the intestinal type. The mean size of these tumors was 2.06 cm, ranging from 0.3 to 3.0 cm. Perineural invasion was identified in 5 cases (100%), angiolymphatic invasion in 4 cases (80%) and lymph node involvement in 3 cases (60%), with 1 case of biliary-type adenocarcinoma presenting compromised surgical margin. Regarding differentiation, 1 (20%) was well differentiated, 2(40%) were moderately differentiated and 2(40%) were poorly differentiated. In the TNM pathological staging we found 2(40%) cases of T1, 2 cases of T2 and 1 case of T3.

A 13-year-old female patient was diagnosed with one (1) case of solid pseudopapillary tumor (Frantz tumor), located in the head of the pancreas, measuring 2.8 x 2.0 cm, limited to the pancreas, with free surgical margins. No perineural or angiolymphatic invasions were detected and the lymph nodes were free of neoplasia. Two cases were diagnosed with Grade 1 well-differentiated neuroendocrine tumor (NET), one case in a 54-year-old male patient and the other case in a 59-year-old female patient. The tumors measured 1.5 x 1.5 cm and 1.2 x 1.0 cm, respectively. The larger tumor was located in the uncinate process and the smaller tumor was located in the head of the pancreas.

Both tumors were limited to the pancreas and did not present perineural or angiolymphatic invasion. There were no lymph node involvement and the surgical margins were clear. Both tumors were pathologically staged as pT1pN0. Finally, two cases of GDP were diagnosed as spindle cell neoplasia, and immunohistochemical (IHC) studies were suggested to establish a definitive diagnosis. One of these tumors was located in the duodenum and measured 17.0 x 17.0 cm, extending to the submucosa, without invasions and with lymph nodes and margins free of neoplasia. Another case measured 5.3 x 3.7 cm and was located in the wall of the small intestine, extending to the submucosa, without perineural or angiolymphatic invasions, with lymph nodes and margins free of neoplasia.

DISCUSSION

GDP is the procedure of choice for the treatment of periampullary tumors, whether they are pancreatic, ampullary, biliary or duodenal. It is one of the most complex surgeries of the digestive system and has a high rate of morbidity and mortality (FERREIRA FERR, et al., 2020). With current advances in surgical technique and pre- and post-operative care, patients undergoing this surgery have been showing better long-term progress, with an excellent quality of life in many cases (ZHANG C, et al., 2023). Over a 5-year period, 37 GDP surgeries were performed at HUOL, for an average of 7.4 (SD=3.2) surgeries per year. Analyzing the temporal distribution of these surgeries, we noticed that in 2021, 14 GDPs were performed, a higher number of surgeries when compared to other years.

Ferreira FEER, et al. (2020) in their study carried out in 2020, studying 105 GDP cases at Hospital Getúlio Vargas, in Recife/PE, from 2002 to 2016, found similar results, with an average of 7 (SD=3.5) surgeries per year. Clinical data of patients available in electronic medical records showed that 27 (72.9%) patients were women and 10 (27.0%) were men. These results differ from those found in other similar studies (FERREIRA FERR, et al., 2020; KAMARAJAH SK, 2018; RADOJKOVIC M, et al., 2018), which always indicate that this surgery is more prevalent in men.

Regarding the age of the patients, in our study we found a lower average age than in other similar studies, as the age varied between 13 and 80 years, with an average of 58 (SD = 12.6) years of age. He J, et al. (2013), in their study with 2564 patients in the United States, found a mean age of 67 years, ranging from 24 to 103

years and Radojkovic M, et al. (2018) found patients with a mean age of 63.1 years (range 39-76 years). Kamarajah SK, et al. (2018) studied the medical records of 9,877 patients in the United States who underwent GDP and most of them (71.3%) were over 60 years old.

Frozen section examinations are routinely performed in cases of GDP to assess margins and confirm the diagnosis, in addition to assessing the resectability of the tumor. The accuracy of the results depends on the indication for the examination, and difficult cases may require a deeper cut and a second opinion from another pathologist, which can reduce the number of errors (CHAVEZ JA, et al., 2022). In cases of examinations requested for margin assessment, the examination has been described as quite accurate (>97%), while those indicated for diagnosis of the primary lesion had an accuracy of over 90% (NELSON DW, et al., 2013).

In our study, 67.5% of the cases had frozen section biopsy indicated, in which 100% agreement was observed in relation to the assessment of surgical margins and 88% agreement in relation to the definitive diagnosis obtained from the paraffin examination. Chaves JA, et al. (2022), in their study carried out between 2014 and 2019, analyzed 221 frozen section examinations in cases of pancreatic tumors and found 97% agreement in the evaluation of margins and 92.8% in the definitive diagnosis.

Most indications for GDPs are related to suspected malignant tumors (primary or residual), with a small proportion of them diagnosed as other conditions. In our study, 3 cases (8.1%) were operated on for benign disease, 1 (2.7%) case of serous cystadenoma, 1(2.7%) case of nonspecific chronic duodenitis and 1 case (2.7%) of chronic pancreatitis. Similar numbers were shown in the study by Ferreira FERR, et al. (2020), who found 10.5% of benign lesions among their cases, mainly pseudo-tumoral pancreatitis and papillitis.

Most cases of GDPs in this study (86.4%) were malignant neoplasms, whose anatomical locations were the pancreas (40.6%), duodenal papilla (37.5%), distal bile duct (15.6%), and duodenum (6.2%). The Brazilian study by Ferreira FERR, et al. (2020) found similar data in the GDPs analyzed: most were located in the pancreas (42%), followed by the ampulla of Vater (37%). KamarajahSK, et al. (2018), studying pancreaticoduodenectomy data from the United States National Cancer Institute over a 10-year period, found a large proportion of tumors also located in the pancreas (79%), followed by the duodenal ampulla (11%).

Although tumors are located only a few millimeters or centimeters apart, survival is generally not uniform among types of periampullary cancers; variation in tumor biology and specific “genetic signatures” are significant prognostic factors that may account for differences in survival. In the study by Kamarajah SK, et al. (2018), the analysis of 9,877 cases in the United States showed that patients with ampullary carcinomas and duodenal carcinomas had a longer survival, followed by cholangiocarcinomas and pancreatic ductal adenocarcinoma.

Duodenal and ampullary carcinomas are diagnosed at an earlier stage than cholangiocarcinoma or pancreatic ductal adenocarcinomas. In that same study, more patients who underwent resection for pancreatic ductal adenocarcinoma were diagnosed at a more advanced stage and had significantly higher rates of positive lymph nodes, reflecting a greater propensity for metastasis of these tumors. Other prognostic factors found in that large study were the proportion of positive lymph nodes, adjuvant radiotherapy, and tumor histologic grade. Pancreatic cancer, the most common malignant tumor found in this study, despite representing only about 2% of all malignant diseases, is the third leading cause of cancer death in the United States (CHAVEZ JA, et al., 2022). In Brazil, it is the 5th leading cause of cancer death in women and the 7th leading cause of cancer death in men (INCA, 2023).

These are generally aggressive tumors, with a 9% 5-year survival rate (CHAVEZ JA, et al., 2022). A size smaller than 2 cm has been associated with a better prognosis (LIM JE, et al., 2003). Winter JM, et al. (2006) in a series of 1175 pancreatic tumors, concluded that a tumor size smaller than 3 cm is a favorable prognostic factor for survival. In our study, however, the mean size of tumors of pancreatic origin found was 3.9 cm (range 2.0-6.4 cm), similar to the study by Ferreira FERR, et al. (2020), in which the mean size of pancreatic tumors was the same. The most common type of pancreatic cancer is Adenocarcinoma, characterized by the presence of neoplastic cells with glandular formation amidst a desmoplastic stroma, with a cystic and/or solid appearance, rarely presenting intraductal calcifications.

Pancreatic ductal adenocarcinoma is the most common histological type, being associated with an unfavorable prognosis (KAMARAJAH KS, 2018; UIJTERWIJK BA, et al., 2024; WINTER JM, et al., 2006). In this study, it was also the most common, corresponding to 24% of malignant tumors. Less frequent histological types of pancreatic tumors include neuroendocrine carcinoma and Frantz tumor. Ampullary tumors accounted for 37.5% of the malignant lesions in this study (n=12). The signs and symptoms of these tumors are nonspecific; they may manifest with signs of obstruction of the bile ducts or pancreatic duct, leading to symptoms such as jaundice, abdominal pain, weight loss, and changes in liver function tests.

The prognosis of tumors located in the Ampulla of Vater is particularly related to the histological type. This region is a “border” between two different types of mucosa, so that intestinal-type carcinomas share histological similarities with duodenal and small bowel carcinomas, while pancreaticobiliary-type adenocarcinomas resemble the epithelia of the distal bile duct and pancreatic duct (FISCHER HP e ZHOU H, 2004; UIJTERWIJK BA, et al., 2024). The second most common histological type found in our study was intestinal adenocarcinoma (n=7, corresponding to 20.6%), which tends to have a less aggressive behavior than other ampullary tumor subtypes (FISCHER HP e ZHOU H, 2004; SANTOS JPLS, 2016). The pancreatobiliary type is associated with greater aggressiveness and worse prognosis (RADOJKOVIC M, et al., 2018), having been found in 3 cases (9%) in this study.

Regardingthe prognosis of ampullary tumors, authors suggest that the depth of pancreatic invasion, not the size of the tumor, seems to be the most important prognostic factor, and angiolymphatic invasion and perineural invasion have also been associated with a worse prognosis (BOUVET M, et al., 2000). In this study, of the 12 ampullary tumors found, 2 (16.6%) presented pancreatic invasion, 2(16.6%) showed invasion into peripancreatic soft tissues and 2(16.6%) showed invasion into adjacent structures. Perineural invasion was also found in 4(33.3%) cases, lymphatic vascular invasion in 3 (25%) and blood vascular invasion in 1(8.3%) case. 8(66.6%) already presented metastases to lymph nodes, a very high number. Surgical margins were free in 100% of cases.

Ferreira FERR, et al. (2020) found in their study that 23.1% of cases had lymph node invasion, 10.3% had perineural invasion and 20.5% had angiolymphatic invasion. In addition, 5.1% of cases had compromised margins. Malignant tumors located in the extrahepatic bile ducts are not very common. They originate in the extrahepatic bile ducts or the common bile duct, and even though they are small in size, they cause early onset of obstructive jaundice. The etiology of these tumors is related to chronic inflammation, such as primary sclerosing cholangitis, bile duct cysts, Caroli's disease and cholelithiasis, in addition to some parasites endemic to South Asia (TYSON GL e EL-SERAG HB, 2011).

Histologically, most distal bile duct carcinomas are pancreatobiliary-type adenocarcinomas, characterized by well-formed, irregular, scattered glands and small cell clusters in a desmoplastic stroma, often with perineural infiltration and angiolymphatic invasion. Other histologic patterns include intestinal-type, foveolar-type, mucinous-type, signet-ring-cell, clear-cell, pyloric-gland-type, hepatoid-type, and invasive micropapillary adenocarcinoma. Rare types include squamous cell, adenosquamous, sarcomatoid, and undifferentiated carcinomas (NAGTEGAAL ID, et al., 2020). In our study, they represented 15.6% of malignant tumors (n=5). The presence of perineural and angiolymphatic invasion is frequent in extrahepatic bile duct tumors and represents an unfavorable prognosis. The involvement of surgical margins is associated with the emergence of local recurrence.

Because these tumors are often multifocal, foci of microscopic invasion can be found in the surgical margins even after complete resection of the main lesion (MURAKAMI Y, et al., 2007; NAGTEGAAL ID, et al., 2020). Our histopathological analysis identified perineural invasion in 5 (100%) cases of distal bile duct tumors, angiolymphatic invasion in 4 (80%), and lymph node involvement in 3 (60%), with 1 case of biliary-type adenocarcinoma presenting compromised surgical margin. In a study of 564 patients with bile duct tumors (cholangiocarcinomas). De Oliveira ML, et al. (2007) found 239 cases of distal bile duct tumors. Of these, 47% had compromised lymph nodes. Ferreira FERR, et al., (2020) found results similar to ours, with 100% perineural and angiolymphatic invasion in distal bile duct tumors. Other histological types were found in smaller numbers in our study.

In particular, we highlight 2 cases of spindle cell tumor, which were referred for immunohistochemical analysis in another service, and the results were not available to us, which is one of the limitations of this study. Despite the inherent complexity of the surgical procedure for GPD and the aggressiveness inherent to most histological types of periampullary tumors, fortunately, advances in the use of effective multimodal oncological therapy are already beginning to increase long-term survival rates for many of these patients.

As the number of long-term survivors increases, assessment of patient quality of life and gastrointestinal symptoms becomes essential. Zhang C, et al., (2024) interviewed 137 patients who underwent GDP due to pancreatic cancer and observed that, compared to the general population in the United States, long-term survivors had an even better quality of life, with less nausea/vomiting, dyspnea, insomnia, loss of appetite, and constipation, however, with more diarrhea. Almost all patients reported that they had postoperative gastrointestinal symptoms (such as pancreatic insufficiency, reflux, and delayed gastric emptying), but that this did not interfere with their quality of life.

CONCLUSION

Our results showed that, unlike most studies found in the current literature, we found a greater number of women than men undergoing GPD in our service. However, our results were similar to those in the literature regarding the histopathological diagnoses found, with a predominance of pancreatic adenocarcinomas and secondly those of the ampulla of Vater. The histological characteristics of the tumors found in our study were similar to those published by other researchers regarding factors such as tumor size, invasions and pathological staging.Furthermore, we were able to confirm that our service has a volume of surgeries comparable to that found in other reference hospital services in our region, with approximately the same average number of procedures performed per year. Regarding the degree of agreement between the results of frozen section and paraffin examinations, our study obtained results concordant with the literature, reaching a high level of concordance. The histological type of periampullary tumors determines their biological behavior and aggressiveness, and careful histopathological evaluation of these specimens is extremely important. Understanding the histopathological characteristics of these neoplasms and the epidemiology of individuals affected by them is of great importance for planning strategies aimed at improving the health care of this population.

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