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Videolaparoscopic pancreatectomy: A literature review

Pancreatectomia por videolaparoscopia: Uma revisão de literatura

Pancreatectomía por videolaparoscopia: Una revisión de la literatura

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Abstract
Introduction: Pancreatectomy is the surgical procedure considered the first line of choice for refractory chronic pancreatitis, locoregional metastases and benign and malignant neoplasms, and may vary anatomically in its proposal, between central, distal or total pancreatectomy. Methodology: The current study is a narrative review, with a time limitation for the last 5 years (2019-2024) which resulted in 780 articles, of which 59 were used as a source of information. Discussion: Laparoscopic distal pancreatectomy is a surgical procedure indicated to treat, mainly, pancreatic endocrine neoplasms, especially NEM1, intraductal papillary mucinous neoplasms, insulinomas and mucinous cystic neoplasms. The indication for the procedure is prior to preoperative classifications, for example, the tumor and splenic vein relationship that assesses the extent of the relationship between scale I to IV variables. In addition, the possibility of the approach being total, distal or central, being previously known in 6 stages among the different techniques. The main complications are pancreatic fistula, hemorrhage, endocrine insufficiency, site infection, sepsis and deep vein thrombosis, which may be in increased prevalence due to the risk factors of advanced age, fatty infiltration of the pancreas, pre-existing diabetes mellitus and use of previous anticoagulants. Conclusion: Laparoscopic pancreatectomy is a minimally invasive surgical technique with extensive advances in reducing complication events, in addition to successive improvements in the assessment of benefits due to reduced risks.
Keywords: Laparoscopic; Treatment; Pancreatectomy.

Resumo

Introdução: A pancreatectomia é o procedimento cirúrgico considerado primeira linha de escolha para pancreatite crônica refratária, metástases locorregionais e neoplasias benignas e malignas. Pode variar anatomicamente em sua abordagem, podendo ser classificada como pancreatectomia central, distal ou total. Metodologia: O presente estudo é uma revisão narrativa, com limitação temporal dos últimos 5 anos (2019-2024) que resultou em 780 artigos, dos quais 59 foram utilizados como fonte de informação. Discussão: A pancreatectomia distal por videolaparoscopia é um procedimento cirúrgico indicado, principalmente, para o tratamento de neoplasias endócrinas pancreáticas, com destaque para NEM1, neoplasias mucinosas papilares intraductais, insulinomas e neoplasias císticas mucinosas. A indicação do procedimento é precedida por classificações pré-operatórias, como a relação entre o tumor e a veia esplênica, que avalia a extensão da relação entre as variáveis em uma escala de I a IV. Além disso, a abordagem pode ser total, distal ou central, sendo previamente estruturada em seis etapas dentro das diferentes técnicas cirúrgicas. As principais complicações associadas incluem fístula pancreática, hemorragia, insuficiência endócrina, infecção do sítio cirúrgico, sepse e trombose venosa profunda, cuja incidência pode ser maior em pacientes com fatores de risco, como idade avançada, infiltração gordurosa do pâncreas, diabetes mellitus pré-existente e uso prévio de anticoagulantes. Conclusão: A pancreatectomia por videolaparoscopia é uma técnica cirúrgica minimamente invasiva que apresenta avanços significativos na redução das complicações pós-operatórias, além de melhorias contínuas na avaliação de seus benefícios, especialmente em relação à diminuição dos riscos cirúrgicos.

Palavras-chave: Laparoscópica; Tratamento; Pancreatectomia.

Resumen

Introducción: La pancreatectomía es el procedimiento quirúrgico considerado la primera línea de elección para la pancreatitis crónica refractaria, metástasis locorregionales y neoplasias benignas y malignas. Anatómicamente, puede variar en su propuesta, entre pancreatectomía central, distal o total. Metodología: El presente estudio es una revisión narrativa, con limitación temporal por los últimos 5 años (2019-2024) que arrojó 780 artículos, de los cuales 59 fueron utilizados como fuente de información. Discusión: La pancreatectomía distal por videolaparoscopia es un procedimiento quirúrgico indicado principalmente para tratar neoplasias endocrinas pancreáticas, destacando la NEM1, neoplasias mucinosas papilares intraductales, insulinomas y neoplasias quísticas mucinosas. La indicación del procedimiento se basa en clasificaciones preoperatorias, por ejemplo, la relación entre el tumor y la vena esplénica, que evalúa la extensión de la relación entre las variables en una escala de I a IV. Además, la posibilidad de abordaje puede ser total, distal o central, estando previamente definida en seis etapas dentro de las diferentes técnicas. Las principales complicaciones incluyen fístula pancreática, hemorragia, insuficiencia endocrina, infección del sitio quirúrgico, sepsis y trombosis venosa profunda, cuya prevalencia puede estar aumentada en presencia de factores de riesgo como edad avanzada, infiltración grasa del páncreas, diabetes mellitus preexistente y uso previo de anticoagulantes. Conclusión: La pancreatectomía por videolaparoscopia es una técnica quirúrgica mínimamente invasiva con avances significativos en la reducción de eventos complicaciones, además de mejoras continuas en la evaluación de los beneficios en función de la reducción de riesgos.

Palabras clave: Laparoscópica; Tratamiento; Pancreatectomía.

1. Introduction

Pancreatectomy is considered the first-choice treatment for benign and malignant pancreatic tumors, such as intraductal papillary mucinous neoplasm, mucinous cystic neoplasm, serous cystic neoplasm and cases of pancreatic ductal adenocarcinoma with multivisceral invasion. It can also be used for other clinical conditions, such as refractory cases of chronic pancreatitis and metastases (Inoue et al., 2023; Domenech Asbun et al., 2024; Wu et al., 2020; Chen et al., 2018;). It is noteworthy that, depending on the type, extent of the disease and the clinical conditions of each patient, central, distal or total pancreatectomy may be indicated (Cai et al., 2021; Cioltean et al., 2020; Hao, Jiang Shiming & Yong, 2021).

Laparoscopic pancreatectomy, a minimally invasive technique, was first described in 1994 and has gained wide acceptance. Although it is more complex, requiring highly qualified professionals to perform this surgery and rigorous assessment of the risks and benefits for the patient, it is quite effective compared to open surgery (Wu et al., 2020; Casadei et al., 2022; Ohtsuka et al., 2022; Liao et al., 2023).

The relevance of evaluating factors that may aggravate this surgery is highlighted, such as male gender, pre-existing diabetes, advanced age, fatty infiltration of the pancreas and pancreatic thickness (Dokmak et al., 2020; Cai et al., 2021; Stefano Partelli., 2020).

This method can be performed using different techniques, exemplified mainly by the total, central and distal videolaparoscopic pancreatectomy approaches. The total form is considered one of the most challenging surgeries today and occurs by combining characteristics of pancreaticoduodenectomy and distal pancreatectomy (Adriano et al., 2022; Cioltean et al., 2020; Cai et al., 2020). Regarding the central videolaparoscopic pancreatectomy technique, it represents a way to avoid exocrine and endocrine pancreatic insufficiency by preserving pancreatic function while maintaining a pancreatic stump. The distal form, which is the most cited form in articles, removes the tail and body portion of the pancreas, with the head of the pancreas preserved (Adriano et al., 2022; Cioltean et al., 2020; Stefano Partelli., 2020; Lee et al., 2024).

It is noteworthy that the reduction of abdominal trauma and postoperative pain, wound complications, length of hospital stay, blood loss, and morbidity are benefits of this surgical technique that greatly aids patient recovery, making it faster and contributing to this surgical technique being considered the gold standard in the treatment of various pancreatic conditions (Kutlu et al., 2021; Wu et al., 2020; Adriano et al., 2022; Casadei et al., 2022). This surgery can lead to complications, such as pancreatic fistula, postoperative hemorrhage, endocrine insufficiency, infections, pneumonia, delayed gastric emptying, and postoperative pancreatitis, which requires adequate management to avoid them and assessment of preoperative risk factors (Dokmak et al., 2020; Cai et al., 2021; Stefano Partelli., 2020).

The objective of the present study is to analyze the scientific literature of main databases, the relationship between the different types and techniques used for pancreatectomy, the main indications and post-operative complications of this surgical technique, thus justifying the need to review and compare the existing information through this literature review.

2. Methodology

The current study is a narrative review (Rother, 2007; Snyder, 2019), with a time limitation for the last 5 years (2019-2024) which resulted in 780 articles, of which 59 were used as a source of information and the 718 non-selected articles were discarded for not having the keywords in the title (138), abstracts unrelated to the topic (455), case reports (86), studies in animal models (12) or with online access restrictions (27).

3. Results and Discussion

3.1 Epidemiology and main indications for laparoscopic pancreatectomy

The main risk factors for this surgical technique are male gender, which has a higher risk of blood loss, proximity of the tumor to the main blood vessels, as it can lead to conversion to open surgery, thickness of the pancreatic parenchyma, fatty infiltration of the pancreas, in addition to risk factors such as advanced age, due to the greater susceptibility of the elderly, especially those over 70 years old, and pre-existing diabetes, as it can cause more complications in the postoperative period (Dokmak et al., 2020; Cai et al., 2021; van Ramshorst et al., 2023; Stefano Partelli., 2020).

The mortality rate of this surgery depends on different factors, such as surgeon experience, type of pancreatectomy performed, clinical conditions, and presence of postoperative complications (Cai et al., 2020; Sheen et al., 2023). In a certain study of patients undergoing total laparoscopic pancreatectomy, there was no mortality from this surgery (Cai et al., 2020). In other studies of patients undergoing central laparoscopic pancreatectomy, it is reported that in one there was no mortality from such surgery (Dokmak et al., 2020).

It is noteworthy that studies related to distal laparoscopic pancreatectomy have demonstrated that there was no mortality due to this surgical procedure even after 90 days, in addition, the reoperation rate due to postoperative complications was 6.2% (Casadei et al., 2022). The rate of surgical reoperation and additional interventions are mainly associated with complications such as grades B and C pancreatic fistula, hemorrhages and postoperative pancreatitis, an extremely serious

condition that requires immediate management for control, intestinal obstruction, infection and abscess, in addition to the type of pancreatectomy, surgical technique and team experience, factors that must be considered and that can substantially influence (Matsumoto et al., 2020; Casadei et al., 2022; Floyd et al., 2022; Cioltean et al, 2020).

Laparoscopic central pancreatectomy is a technique that removes the central part of the pancreas, preserving the tail and part of the body of the organ (Nguyen et al., 2024). It is a therapeutic option for benign lesions, neuroendocrine tumors, pancreatic cystadenomas and small intraparenchymal tumors that are not suitable for enucleation and mucinous cystic neoplasms, intraductal papillary mucinous neoplasms and solid pseudopapillary neoplasms, which are low-grade malignant lesions (Cioltean et al., 2020; Borys et al., 2022; Won et al., 2019). The choice of central pancreatectomy compared to distal pancreatectomy is based on the preservation of healthy pancreatic tissue and in reducing the risk of endocrine and exocrine insufficiency in patients (Cai et al., 2021; Cioltean et al., 2020).

Laparoscopic distal pancreatectomy is a procedure that removes the tail of the pancreas, usually to treat low-grade benign or malignant tumors, used in cases of intraductal papillary mucinous neoplasm, serous cystic neoplasm, pancreatic neuroendocrine tumor, solid pseudopapillary neoplasm and lymphoepithelial cyst (Sahakyan et al., 2020; Casadei et al., 2022; Won et al., 2019, Ome et al., 2019).

Total pancreatectomy consists of the surgical removal of the entire pancreas. This intervention is quite complex, although rarely performed, it should be done in some cases where the preservation of part of the pancreas is unfeasible or represents an unacceptable risk, being the main indications in some cases of pancreatic ductal adenocarcinoma, chronic pancreatitis, intraductal papillary mucinous neoplasia and multifocal neuroendocrine tumors (Cai et al., 2020; Munoz et al., 2022).

Preservation of the spleen and splenic vessels is of fundamental importance, since splenectomy together with this surgery can cause complications, such as intraoperative bleeding, thrombocytosis and infections, including post-splenectomy sepsis, a substantially fatal condition (Sun et al., 2023; Kim et al., 2018; Lee et al., 2024)

3.2 Classifications that help indicate this method

It is noteworthy that pancreatectomy is widely used in several cases of malignant and benign tumors, such as pancreatic ductal adenocarcinoma, intraductal papillary mucinous neoplasia, multifocal neuroendocrine tumors, mucinous cystadenomas and pseudopapillary tumors. When the clinical condition affects the tail or body of the pancreas, distal pancreatectomy can be performed, thus preserving the head of the pancreas and, therefore, part of the pancreatic function (Stefano Partelli et al., 2020; Sanne Lof et al., 2019; Zhang et al., 2019; Coco et al.; 2021).

Furthermore, it is performed in cases of chronic pancreatitis that present complications, such as in cases of pancreatic pseudocysts, which do not respond to conservative treatment, ductal obstruction to relieve the occlusion of the pancreatic duct caused by such condition, in addition to intractable pain, and is therefore performed in more severe cases that are refractory to clinical treatment (Cai et al., 2021; Stefano Partelli et al., 2020). You can also be indicated in cases of metastases of renal cell carcinoma to the pancreas in more specific situations, in order to completely resect the tumor (Stefano Partelli et al., 2020; Cai et al., 2020).

In relation to multiple or diffuse neoplasms, videolaparoscopic pancreatectomy is indicated in some situations:

1. Pancreatic endocrine neoplasias (PENs) associated with multiple endocrine neoplasia syndrome type 1 (MEN1), where some important indications are:

Tumors larger than 1 cm Hypergastrinemia and hypoglycemia Localization and preoperative diagnosis

2. Intraductal papillary mucinous neoplasms (IPMN):

Main duct IPMN is an indication for performing this type of surgery

3. Insulinomas: the technique is safe for single, benign insulinomas located superficially in the anterior part of the pancreas.

4. Mucinous cystic neoplasms: laparoscopic surgery can be applied to this type of neoplasm, even in large tumors.

Hereditary pancreatitis is a rare condition that causes chronic inflammation of the pancreas due to genetic mutations. The indications for surgical management of this type of pancreatitis are: 1. relief of chronic pain refractory to conservative treatment, 2. prevention or treatment of complications (ductal dilation, pancreatic calcifications, pseudocysts and bile duct or duodenal obstruction), 3. prevention of long-term complications such as pancreatic cancer (especially in those with known genetic mutations, significant family history of diabetes mellitus).

Among the possible examinations, contrast-enhanced computed tomography and magnetic resonance imaging stand out forevaluate the pancreas and surrounding blood vessels (Nakata et al., 2021). The size and location of the tumor is very important to assess, as it contributes to surgical planning and to help determine whether or not the splenic vessels will be removed (Cai et al., 2021; Cai et al., 2020; Wang et al., 2019).

There is a classification that determines the relationship between the tumor and the splenic vein, which helps to assess the extent of the surgery. It is classified into 4 types: Type I: invasion or involvement of the splenic vein by the tumor, resulting in occlusion of the vein. Type II: Compression of the splenic vein by the tumor, causing narrowing of the lumen, but without occlusion. Type III: Contact between the tumor and the splenic vein without narrowing of the lumen. Type IV: Absence of contact between the tumor and the splenic vein (Xu et al., 2020).

Contrast-enhanced computed tomography also assesses dilation of the main pancreatic duct and atrophy of the pancreatic parenchyma (Sun et al., 2024). Abdominal magnetic resonance imaging is also extremely important in pre-surgical evaluation, as it can provide information about the nature of the tumor and its relationship with the bile ducts (Stefano Partelli et al., 2020; Xu et al., 2020; Kuriyama et al., 2020).

3.3 Surgical Technique

Laparoscopic pancreatectomy can be performed total, distal or centrally depending on the indication for the procedure, and different techniques can be used (Dokmak et al., 2020; Cai et al., 2020; Kovler et al., 2019; Jun et al., 2019). Total laparoscopic pancreatectomy presents a surgical technique generally based on 6 steps, which are:

I. Patient positioning and trocar distribution: The patient is in the Trendelenburg position, with the use of five trocars for laparoscopic access (Cai et al., 2020; Wu et al., 2019).

II. Initial exploration: When the cause of the surgical procedure is the appearance of neoplasia, the patient's abdomen is explored to observe whether there are metastases (Cai et al., 2020; Wu et al., 2019).

III. Dissection: First, it is important to identify important vessels that may interfere with the procedure if injured, such as the superior mesenteric artery and vein. After this step, dissection begins. For tumors that do not present vascular invasion, the “head approach” is adopted, preserving the spleen when possible. In situations with invasion of the superior mesenteric/portal vein (SMV/PV), the “tail approach” is used, where dissection begins at the tail of the pancreas and includes splenic resection (Cai et al., 2020; Wu et al., 2019; Liu et al., 2021).

IV. Digestive reconstruction: An anastomosis is performed between the jejunum and the hepatic duct, in addition to a duodenojejunostomy or gastrojejunostomy to restore intestinal transit (Cai et al., 2020; Wu et al., 2019).

V. Specimen removal and drainage: In this step, the dissected pancreas is removed through the umbilical

incision. After that, drains are introduced for post-surgical monitoring and follow-up. (Cai et al., 2020; Wu et al., 2019).

VI. Postoperative management: After the procedure, because of the complete removal of the pancreas, that is, with loss of endocrine and exocrine function, insulin and pancreatic enzymes are administered, and the patient is monitored regularly (Cai et al., 2020, Wu et al., 2019).

Laparoscopic distal pancreatectomy is most commonly used for low-grade malignant tumors or benign tumors, and is characterized by the removal of the tail of the pancreas. This surgical technique consists of (Asbun et al., 2019: Sugimachi et al., 2020; Hong et al., 2022; Shiozaki et al. 2021):

- Patient positioning and distribution of trocars: First, the patient must be positioned in the supine position with left elevation or in the right lateral position, after which the trocars must be introduced, one infraumbilical, to induce pneumoperitoneum from the introduction of carbon dioxide into the abdomen, and another 3-4 additional trocars. (Adriano et al., 2022; Floyd et al., 2022).
- Pancreatic exposure and identification of pancreatic lesion: This step consists of dividing the gastrocolic ligament, with preservation of the gastroepiploic vessels, towards the spleen to expose the pancreas, followed by intraoperative ultrasound to identify the pancreatic lesion. (Adriano et al., 2022; Floyd et al., 2022; Park et al., 2024: Morikawa et al., 2019).
- Pancreatic dissection and transection: The lower margin of the body should be dissected down to the tail of the pancreas, seeking to identify and isolate the splenic vein. After that, the upper margin should be dissected, seeking to do the same with the splenic artery. Thus, the splenic vessels should be followed up to the spleen, performing ligations of the pancreatic branches with clips and/or energy devices. After that, the tail of the pancreas should be mobilized and elevated over the splenic vessels (Nagai et al., 2020). The subsequent transection is performed with an endoscopic linear stapler, adjusting according to the thickness of the patient's pancreas. (Adriano et al., 2022; Floyd et al., 2022; Park et al., 2024: Ishikawa et al., 2018; Aoki et al., 2020)
- Spleen mobilization and removal of the sectioned portion: The spleen must be mobilized and perigastric, peripancreatic and perisplenic lymph nodes must be sought, which must be harvested for lymphadenectomy if present. After this, the specimen is positioned in a sterile bag for extraction. (Adriano et al., 2022; Floyd et al., 2022; Park et al., 2024).
- Drainage and postoperative care: A surgical drain is positioned in the pancreatic and splenic region. Intense patient monitoring and follow-up are necessary for early identification of post-surgical complications and for better management of each patient's case. (Adriano et al., 2022; Floyd et al., 2022; Park et al., 2024; Song et al., 2020).

Central pancreatectomy aims to preserve pancreatic function by removing only part of the pancreas, while trying to maintain the tail and part of the body. It involves a surgical technique based on 5 steps:

I. Positioning and access: With the patient in the supine position, 5 trocars are positioned, one optical one supraumbilical and four working ones on the left and right sides of the abdomen (Cioltean et al., 2020, Xiang et al., 2024).

II. Exposure of the lesion: Access to the omental bursa is performed by sectioning the gastrocolic ligament, exposing the pancreas to locate the tumor by elevating the stomach, allowing observation of the anterior pancreatic border. The position of the tumor can be confirmed by intraoperative ultrasound (Cioltean et al., 2020; Xiang et al., 2024).

III. Dissection and transection: In this step, the pancreatic parenchyma must be dissected to expose the portomesenteric axis, with the posterior margin of the pancreas separated from the superior mesenteic vein. Transection is performed

with an endoscopic stapler for the proximal stump and a Harmonic device for the distal stump. Since this surgical procedure is not ideal for malignant tumors, it is recommended that the specimen removed during surgery be rapidly analyzed histopathologically during the operative period, because if there is evidence of malignancy, a distal or total pancreatectomy must be performed (Cioltean et al., 2020; Xiang et al., 2024; Kazaryan et al., 2019).

IV. Pancreato-gastric anastomosis: A gastrotomy is performed on the posterior wall of the stomach, inserting the distal pancreatic stump, followed by suturing using a separate points for fixation (Cioltean et al., 2020; Xiang et al., 2024).

V. Postoperative: Monitoring and follow-up of the patient for early identification in cases of complications after the procedure (Cioltean et al., 2020; Xiang et al., 2024).

3.4 Main post-operative complications

Postoperative complications of laparoscopic pancreatectomy can be significant and require strict medical monitoring, the main ones being: pancreatic fistula, hemorrhage and endocrine insufficiency. Laparoscopic central pancreatectomy is the one that demonstrates the highest rate of complications (Dokmak et al., 2020; Song et al., 2018; Milito et al., 2018).

3.4.1 Pancreatic Fistula

Pancreatic fistula is a significant complication in all types of pancreatectomy, where the rate of clinically relevant pancreatic fistula (grade B and C) ranges from 20% to 31% in laparoscopic central pancreatectomy. Pancreatic fistula occurs when pancreatic juice, rich in digestive enzymes, leaks from the suture line of the pancreas. (Seiko Hirono et al., 2021; Cai et al., 2021; Stefano Partelli., 2020: Dokmak et al., 2019). A study that analyzed 144 patients who underwent different types of laparoscopic pancreatectomy, including central, distal spleen-preserving, and pylorus-preserving pancreatectomy, observed clinically relevant fistula rates of 40%, 7.3%, and 3.6%, respectively (Cai et al., 2021).

3.4.2 Hemorrhage

Postoperative hemorrhage is another serious complication that can occur in all types of pancreatectomy. In laparoscopic central pancreatectomy, the hemorrhage rate ranges from 15% to 25%. Hemorrhage may be early, occurring within the first 24 hours after surgery, or late, occurring after 24 hours and carrying a higher risk of mortality. The sources of bleeding may be blood vessels in the pancreas itself or from adjacent vessels, such as the gastroduodenal artery, common hepatic artery, and splenic artery (Dokmak et al., 2020; Cai et al., 2021; Stefano Partelli., 2020). One study reported an overall postoperative hemorrhage rate of 1.4% in 144 patients undergoing different types of laparoscopic pancreatectomy (Cai et al., 2021).

3.4.3 Endocrine Insufficiency

Endocrine insufficiency may occur long-term after pancreatectomy, especially in central pancreatectomy, because a larger portion of the pancreas is removed. In the long term, there is a 6–8% risk of developing endocrine insufficiency after laparoscopic central pancreatectomy. This complication arises when the remaining pancreas cannot produce enough hormones, such as insulin, which can result in diabetes (Dokmak et al., 2020; Cai et al., 2021; Stefano Partelli., 2020). One study, 18.1% of patients undergoing pylorus-preserving pancreatectomy and 12.2% of patients undergoing distal pancreatectomy with spleen preservation required insulin treatment after surgery (Cai et al., 2021).

3.4.4 Other Complications

In addition to the complications previously mentioned, patients undergoing pancreatectomy may present other

complications, such as: Infection, Pneumonia, Deep vein thrombosis, Delayed gastric emptying, postoperative fluid collection (seen by radiological imaging) and Postoperative pancreatitis (Dokmak et al., 2020; Chen et al., 2019; Stefano Partelli., 2020). Advanced age, fatty infiltration of the pancreas, pre existing diabetes, and the use of anticoagulants are factors that increase the risk of complications. Surgical techniques such as ligation of collateral vessels, omentoplasty (interposition of the greater omentum between the sections of the pancreas), and adequate drainage can help minimize the risk of pancreatic fistula and hemorrhage (Nishino et al., 2020; Dokmak et al., 2020; Cai et al., 2021; Partelli., 2020).

3.5 Impact and prognostic importance

Laparoscopic pancreatectomy is a minimally invasive technique that represents an advance in the surgical treatment of pancreatic conditions, offering several benefits to the patient, such as reduced abdominal trauma, postoperative pain, blood loss and hospital stay, havingthe several benefits in relation to the open technique, a fact that has made this technique widely used in the current context (Inoue et al., 2023; Domenech Asbun et al., 2024).

It can be used to treat various pathologies, including malignant and benign tumors, pancreatic ductal adenocarcinoma, intraductal papillary mucinous neoplasia, multifocal neuroendocrine tumors, insulinomas, among o others. In addition, it can be used in refractory situations of chronic pancreatitis, metastasis of renal cell cancers and even cases of hereditary pancreatitis. The type of surgical technique used is decided based on the specific characteristics of each case and the needs depending on the clinical condition of each patient (Adriano et al., 2022; Cioltean et al., 2020; Cai et al., 2020).

Imaging methods for preoperative evaluation, such as magnetic resonance imaging and contrast-enhanced computed tomography, are used to evaluate the pancreas and adjacent blood vessels, providing essential information for decisions on patients' surgical criteria and a safe approach during the procedure. This surgery can present complications in the postoperative period, such as pancreatic fistula, hemorrhages, endocrine insufficiency, infections and even sepsis, which requires adequate management to control such complications (Stefano Partelli et al., 2020; Lof et al., 2019: Zhang et al., 2019).

Such complications can be caused by some risk factors, such as male gender, senescence, pre-existing diabetes and changes in the pancreatic parenchyma. Therefore, it is important to have professionals properly trained for adequate surgical management. It is noteworthy that in different studies analyzed, the mortality rate was zero for the various types of pancreatectomy performed, which demonstrates safety in this procedure, if performed by highly qualified physicians (Dokmak et al., 2020; Cai et al., 2021; Stefano Partelli., 2020).

4. Conclusion

Laparoscopic pancreatectomy is a minimally invasive technique that represents an advance in the surgical treatment of pancreatic conditions, offering several benefits to the patient. However, this surgery can present complications in the postoperative period, such as pancreatic fistula, hemorrhages, endocrine insufficiency, infections and sepsis, which requires appropriate management to control such complications.

Therefore, continued research and improvement of surgical techniques are essential to expand the benefits of this approach and minimize associated risks, ensuring that patients receive the most effective and safe treatment possible.

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