

Laparoscopic pancreatobiliar surgery: Initial experience in high specialty regional hospital

Cirugía pancreatobiliar laparoscópica: experiencia inicial en el hospital regional de alta especialidad

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Abstract

Background: At present benign and malignant pancreatobiliar diseases, required a multidisciplinary management, and the different techniques to solve, this pathology has been improve with new technology and surgeons training. **Objective:** The purpose of this article is to describe that de minimally invasive surgery on benign and malignant pancreatobiliar diseases is feasible and offer good results. **Method:** In hospital regional ISSSTE Puebla from July 2013 to July 2018, 30 consecutive patients with different pancreas and biliary pathologies have been operated by totally laparoscopic, by the same surgeon and surgical team, and following for up to 4 years. **Results:** None all the patients presented sever complications during surgery or after immediate surgery and no reoperations. Surgical time and blood loss were acceptable. **Conclusion:** The results we obtained are positive and encouraging, because the morbidity and mortality are similar to the different sources, we reviewed, nevertheless, this study is our initial experience and we required more cases to obtain a significant sample.

Keywords: Malignant and benignant pancreatobiliar diseases. Advanced laparoscopy. Laparoscopic pancreatobiliar surgery. Choledocholitiasis. Biliodigestive bypass. Biliopancreatic tumors.

Resumen

Antecedentes: En la actualidad las enfermedades benignas y malignas de las vías biliares y del páncreas requieren un manejo multidisciplinario, y las técnicas para resolver este tipo de padecimientos han avanzado gracias al mejoramiento en la tecnología y la capacidad del personal humano. **Objetivo:** El propósito de este trabajo es presentar varios casos y demostrar que la cirugía de mínima invasión en patología benigna y maligna pancreatobiliar es viable y se pueden obtener adecuados resultados. **Método:** De julio de 2013 a julio de 2018, 30 pacientes consecutivos han sido intervenidos quirúrgicamente por vía laparoscópica por diversas enfermedades que involucran páncreas y vías biliares, por el mismo cirujano y equipo quirúrgico, con un seguimiento de hasta 4 años. **Resultados:** Ninguno de los pacientes intervenidos presentó complicaciones graves en el transoperatorio ni en el posquirúrgico inmediato, ninguno fue sometido a una segunda cirugía y los tiempos quirúrgicos y el sangrado fueron aceptables. **Conclusión:**

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Los resultados son positivos y muy alentadores, ya que la morbilidad fue muy similar a la de las series que se revisaron; sin embargo, este estudio es nuestra experiencia inicial y requerimos aumentar el número de casos para obtener una muestra significativa.

Palabras clave: Cirugía pancreatobiliar laparoscópica. Cirugía de mínima invasión. Tumores benignos y malignos de páncreas y vías biliares. Coledocolitiasis. Enfermedades pancreatobiliares. Derivación biliodigestiva.

Introduction

Pancreaticobiliary pathology comprises a very broad spectrum of diseases, both benign and malignant, which require highly specialized and multidisciplinary management^{1,2}. Since the 1990s, when laparoscopic surgery was introduced in Mexico, various laparoscopic surgical procedures have been carried out with good results. Pancreatic resections started in the same decade, mainly for benign pathology^{3,4} and, later, the first reports of pancreatic surgery for malignant disease were recorded, which initially was limited to staging or obtaining biopsies and later started being used for major resections. Biliary tract surgery for benign or malignant obstructive disease has gained strength and there are several derivative procedures that are carried out with minimally invasive surgery, with a highly significant decrease in morbidity compared to conventional surgery⁵⁻⁷, from purely palliative treatment to curative treatment in the specific case of benign disease^{8,9}. Laparoscopic pancreaticobiliary surgery has gained acceptance as better results have been obtained in surgical times, morbidity, mortality, and less surgical trauma in comparison with open surgery, in addition to offering the advantages of minimally invasive surgery^{10,11}.

Method

From July 2013 to February 2018, at the Institute for Social Security and Services for State Workers (ISSSTE – *Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado*) Puebla High Specialty Regional Hospital, different laparoscopic procedures involving the pancreas and bile ducts have been performed for both benign and malignant pathology, with good results. We present 30 cases of patients who underwent various procedures, with biliodigestive derivations and pancreatic resections for different causes standing out.

Results

Of the 30 included patients, 25 were women (82%) and five men (18%), aged between 36 and 83 years (mean: 65 years) (Table 1). Twelve patients (42%)

Table 1. Type of pathologies resolved by laparoscopy at ISSSTE Puebla High Specialty Regional Hospital

Pathology	Patients
Choledocholithiasis	11
Choledochal cyst	2
Mirizzi syndrome	1
Bile duct injury	3
Ampuloma	3
Pseudopapillary tumor of the pancreas tail and head	2
Pancreatic head adenocarcinoma	7
Lemmel syndrome	1

underwent choledochoduodenostomy (Fig. 1), 11 due to primary choledocholithiasis of large elements not resolved by endoscopic sphincterotomy and one due to Lemmel syndrome; ten patients (32%) underwent Roux-en-Y hepaticojejunostomy (Fig. 2), four due to pancreatic head adenocarcinoma with irresectability criteria and failed biliary prosthesis endoscopic placement, two due to type IVa and type I choledochal cyst (Fig. 3), one for type IV Mirizzi syndrome and three for bile duct injury (Strasberg E2 and E3) (Figs. 4 and 5); and seven patients (21%) underwent pancreaticoduodenectomy for malignant disease, three for malignant neoplasm of the ampulla of Vater (Fig. 6) and three for pancreatic head cancer, and one for pancreatic head pseudopapillary solid tumor and one patient who underwent distal pancreatectomy with splenic preservation for pseudopapillary solid tumor of the pancreatic tail (Table 2).

Of the patients with choledochoduodenal anastomosis, none had complications. Of the patients with Roux-en-Y hepaticojejunostomy, one (pancreatic head adenocarcinoma) had a biliary fistula that required medical treatment and nutritional support for the fistula to be resolved. Among the patients who underwent the Whipple procedure, one had pneumonia that required admission to the intensive care unit for 13 days postoperatively, which was successfully resolved with medical treatment, and another had

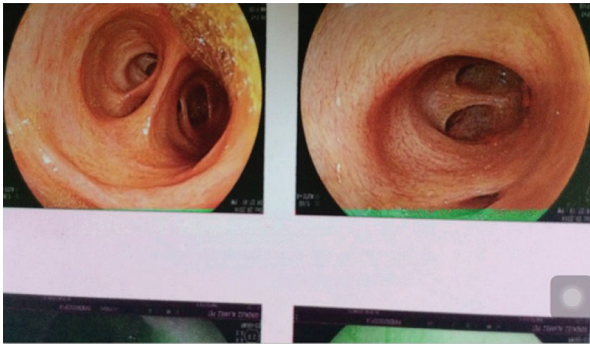


Figure 1. Endoscopic control after choledochoduodenostomy.

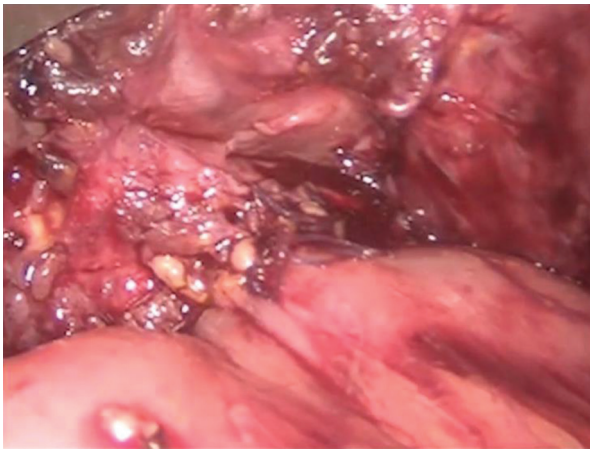


Figure 2. Completed hepaticojejunostomy after Strasberg E2 bile duct injury.



Figure 3. Magnetic resonance imaging of a patient with type IVa choledochal cyst.

moderate transsurgical bleeding (700 cc). Finally, one patient with a pancreatic tail tumor who underwent distal pancreatectomy with splenic preservation had no postsurgical complications.

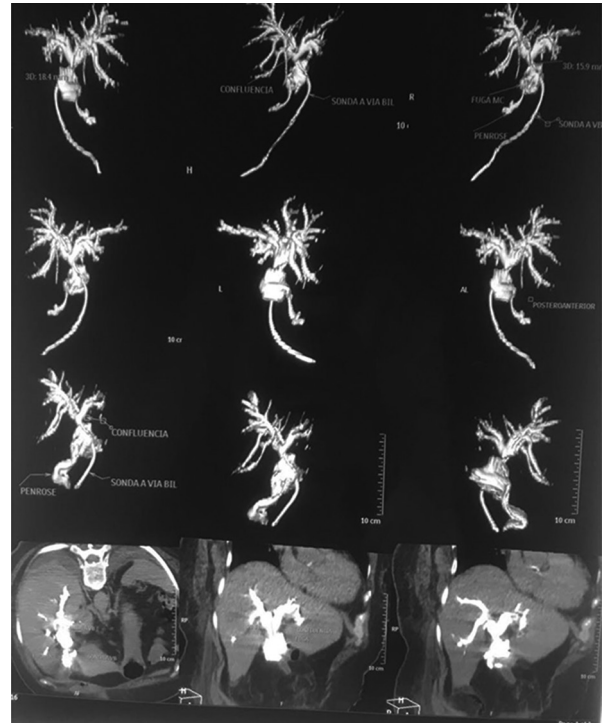


Figure 4. Cholangiotomography showing distal bile duct break in continuity 2 cm below the confluence of right and left liver ducts (Strasberg E2 bile duct injury).

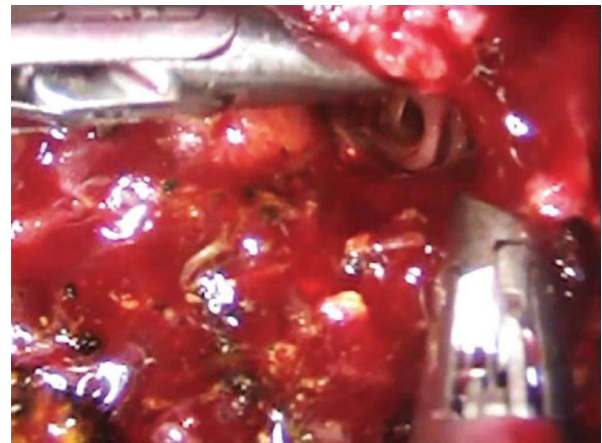


Figure 5. Proximal bile duct dissected after Strasberg E2 bile duct injury.

No patient had transoperative or postsurgical serious complications. There was conversion to traditional surgery in one patient who underwent pancreaticoduodenectomy for transoperative bleeding that could not be controlled by minimally invasive procedures, with good post-operative evolution. No patient underwent reoperation. Hospital length of stay was 5 to 19 days, transsurgical bleeding was between 100 and 1200 mL, and surgical times were 3 to 9 h.

Table 2. Surgical procedures performed by laparoscopy

Surgeries	n
Choledochoduodenostomy	12
Roux-en-Y hepaticojejunostomy	9
Distal pancreatectomy with splenic preservation	1
Pancreaticoduodenectomy	7

**Figure 6.** Duodenoscopy with ampuloma finding and biopsy sample collection.

Discussion

Since the 1990s, when the first laterolateral choledochoduodenostomy procedures were performed for benign pathology and later for malignant disease, biliary bypass (both choledochus-duodenum and hepatic-jejunum, as well as Roux-en-Y anastomosis) for this type of diseases has had highly favorable results, which is why it has been proposed as first-choice definitive surgical management instead of traditional surgery^{6,12}.

The role of minimally invasive surgery in Mexico started with the treatment of inflammatory diseases of the pancreas, mainly acute pancreatitis complications such as necrosectomy and cystogastroanastomosis³. Subsequently, staging and partial resections for benign and malignant diseases began with Bernheim, Cuschieri, Ishida, and Meyer Burg until, in 1994, the first laparoscopic pancreaticoduodenectomy was performed in a woman with chronic pancreatitis^{1,3}. Since then, laparoscopic surgery has evolved in such a way that there are practically no contraindications or

limitations regarding the type of pathologies that can be resolved with this technique^{13,14}. The results obtained with this type of procedure have been reported, and the vast majority agree that the minimally invasive technique in pancreaticobiliary surgery is highly effective^{15,16}, and specially for distal pancreatic resections with or without splenic preservation, it is gaining great strength, and in numerous studies, it is the first option for diseases within this region of the pancreas¹⁷⁻²¹.

Although it is true that interventional endoscopy has had excellent results in the treatment of obstructive pathology, both benign and malignant, in diseases of the pancreas and biliary tract, minimally invasive pancreaticobiliary surgery has been shown to be highly effective for the resolution of complex cases not resolved by endoscopy and in patients with surgical indication, with acceptable morbidity and mortality being shown in comparison with open surgery and with promising results²². Its limitations include technical complexity when resections of one or more organs, gastrointestinal tract anastomosis and vascular dissections are involved. In addition, there are studies that have emphasized that proper patient selection is highly important in order for better results to be obtained^{21,23}.

Our study presents 30 cases of patients with different pathologies that required some type of surgical intervention, either endoscopic or laparoscopic. The selection of cases was according to the type of disease, age, patient general health status and complete diagnostic work-up (imaging, laboratory, biopsies, etc.), with endoscopic resolution of the problem in accordance with international guidelines being offered in some cases and, in those cases that could not be resolved by this means, endoscopic resolution was decided.

Conclusion

Minimally invasive pancreaticobiliary surgery for benign or malignant disease is currently viable, and as more reports and experience around the world become available, it will gain ground and perhaps in the future, it will be the first surgical option. Our hospital is a referral center that serves the population of all municipalities of the State of Puebla and other States of the Mexican Republic (Tlaxcala, Veracruz, and Oaxaca), which is why it is necessary to increase the sample size and continue with patient long-term follow-up.

The results we obtained are positive and highly encouraging since morbidity was very similar to that

reported in the series that were reviewed. However, this study is our initial experience, and we need to continue increasing the number of cases in order for a significant sample to be obtained.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were conducted on humans or animals for this research.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors have obtained informed consent from the patients and/or subjects referred to in the article. This document is in the possession of the corresponding author.

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