

## Laparoscopic Longitudinal Pancreatojejunostomy for Chronic Pancreatitis: Report of First Ukraine Experience

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### ABSTRACT

**Introduction:** Surgery is a more effective option for pain relief in chronic pancreatitis. It relates to those patients, who don't have an increase in the head of the pancreas, and there is only dilatation of the main pancreatic duct, a good result can give the performance of laparoscopic longitudinal pancreatojejunostomy.

**Materials and Methods:** Four attempts of laparoscopic lateral pancreatojejunostomy were made in patients with early chronic pancreatitis without an increase in the head of the pancreas. There were two females and two men and average age was 42,6. The indications for surgery in all patients was abdominal pain and dilatation main pancreatic duct (the average diameter was 12,8 mm). We used five-port technique. After opening omental bursa, we found, punctured and opened the main pancreatic duct. Then, using two linear staplers Endo-Gia 60 to handle the jejunum loops by Roux-en-Y. We we performed single-row longitudinal pancreatojejunostomy with barbed-suture V-Loc.

**Results:** We had two conversions to open surgery, because of the inability to find the main pancreatic duct and bleeding. The average operation time was 207 minutes. Post-operative stay was average 9 days and on median follow-up of 12 month. Post-operatively, there were no major morbidity and nil mortality. All patients had complete pain relief and significant weight gain.

**Conclusion:** Laparoscopic longitudinal pancreaticojejunostomy is safe, effective and feasible, especially with "early chronic pancreatitis" without an increase in the head of the pancreas.

### Keywords

Chronic pancreatitis, Laparoscopic lateral pancreaticojejunostomy.

### Introduction

Chronic pancreatitis (CP) is a painful inflammatory disease that leads to progressive and irreversible destruction of pancreatic parenchyma [1]. Over the past 40 years, more than two-fold increase in the incidence of CP has been observed, therefore, the issue of treatment for CP and its complications have a great socio-economic significance [2]. Progression of CP leads to irreversible destruction of the pancreatic tissue, the expansion of small and large ducts, calcification and fibrosis, leading to loss of the

functioning parenchyma, the further development of chronic pain, endocrine and/or exocrine insufficiency, and an increased risk of pancreatic cancer [3]. Almost all treatment options for CP aim to combat pain, and only surgical interventions that have more pronounced and long lasting effect compared with, for example, endoscopic interventions are most effective [1,4].

Laparoscopic surgical procedures today due to technological progress are actively used and implemented in pancreatic surgery, but their use in CP remains insufficient. The first report on the successful implementation of laparoscopic longitudinal pancreatojejunostomy (LLPJS) was made by Kurian and Gagner

in 1999 [5]. Today there is a small number of reports on the successful implementation of the LLPJS, with the largest number of operations 12 and 17 among two surgeons [6,7]. The number of LLPJS performed in other surgeons, according to these publications by 2015, together did not exceed 50 operations [8-13]. But assessments of the relevance and feasibility of LLPJS are limited by an abundance of publications and very controversial among known pancreatic surgeons.

### Materials and Methods

For the period 2016-2018, four attempts were made by the LLPJS on the basis of the Department of Surgery and Minimally Invasive Technologies, which was 16% among all patients with CP operated during this time. Among them were two women and two men, the average age was 42,6 years. Inclusion criteria were patients with CP disease without enlargement of the head of pancreas and dilatation of the main pancreatic duct over 10 mm (mean diameter 12,8 mm) and the presence of concretions only in its lumen, without biliary and portal hypertension.

### Surgical technique

Position of the patient on the operating table on the back with dilated legs. The operating surgeon was located from the beginning between the legs of the patient, the assistants are on the right and on the left, then at the stage of formation of pancreatojejunostomosis on the right, and the cameramen is between the legs of the patient. The inclination angle of the operating table during the operation was changed for greater convenience of the surgical team and better access to the area of interest. The first trocar is set slightly below the navel after reaching the pressure in the abdominal cavity 12-14 mm Hg. In addition, two troacars mounted on the right and one or two to the left of the navel (Figure 1) were additionally fanciful.

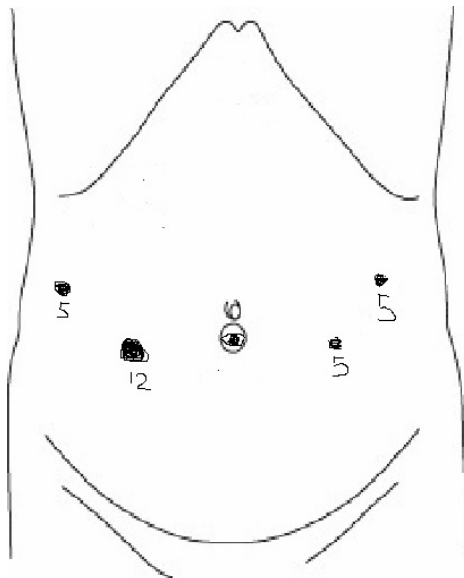


Figure 1: Portplacement for Laparoscopic Longitudinal Pancreatojejunostomy.

The lesser sac was opened with the aid of an ultrasound dissection device Sonicision, the stomach was lifted upward, the pancreas was identified, then punctured (Figure 2), and the opening of the main

pancreatic duct from the isthmus to the body using a monopolar hook was performed (Figure 3).

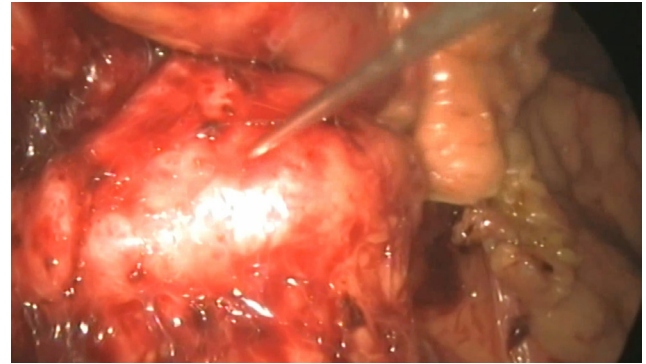


Figure 2: Puncture of the main pancreatic duct.

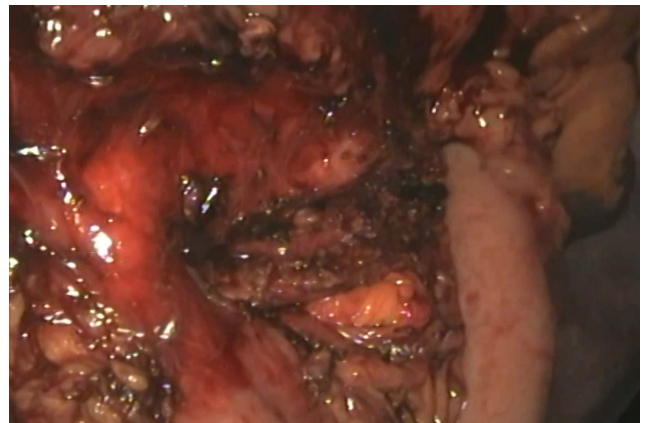
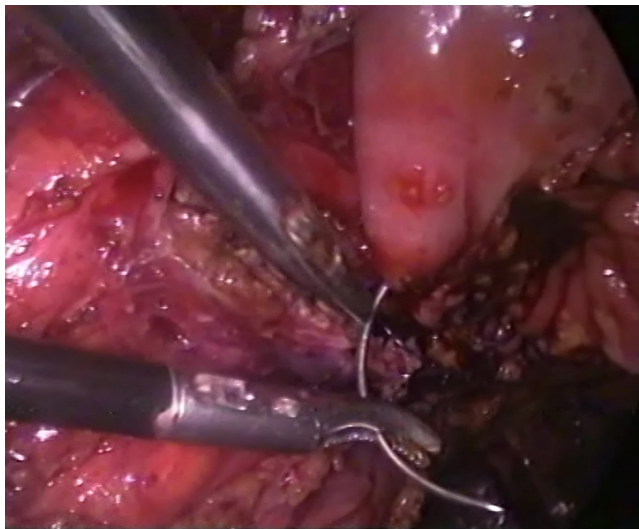


Figure 3: Appearance of the main pancreatic duct (indicated by an arrow).

Concrements were removed from the main pancreatic duct. Using the stapler, Endo GIA 60 (blue cassette) the small intestine at a distance of 30 cm from the ligament of Treitz (Figure 4) was intersected, and its detachable part was carried through a hole in the mesocolon to the pancreas. With the help of barbed suture V-lok 2-0 length of 30 cm we formed longitudinal pancreatojejunostomosis with a single-row continuous suture (Figure 5).



Figure 4: Intersection of the small bowel stapler Endo GIA 60.



**Figure 5:** Formation of laparoscopic longitudinal pancreatojejunostomy.

At the expense of the Stapler, Endo GIA 60 (blue cassette) was formed by jejunojunction (Roux-loop), the hole after the stapler was sutured with a single-row suture V-lok 2-0 15 cm. For all patients cholecystectomy with separate clamping of the bladder duct and artery was performed. The operation was completed by drainage of the abdominal cavity and sewing of the ports.

## Results

The table shows the results of operations (Table 1).

Number of patients	4
Successful total LLPJS	2
Conversion	2
Duration of operation	175 to 240 min
Intraoperative blood loss	50 to 120 ml
Mortality	-
Complications	1 (grade II by Clavien-Dindo)
Duration of stay in hospital	7 and 15 days
Follow-up	18 and 8 months.

**Table 1:** Results of laparoscopic longitudinal pancreatojejunostomy.

With four attempts, the total laparoscopic operation was performed in 2 patients. In 2 patients, a conversion was made: in one case, due to uncontrolled bleeding from the pancreas, in the other - because of the inability to find the main pancreatic duct. It is possible to avoid conversion by using intraoperative ultrasound. The average transaction time was 207 minutes. The post-operative stay was an average of 9 days, and the average follow-up observation period was 13 months.

One patient was observed to have a flow of bile by drainage up to 4 days, which spontaneously stopped. There were no pancreatic fistulas and fatal cases. All patients in the long-term outcome noticed pain disappearance and weight gain. According to the questionnaires SF-36 and EORTC BCH there was a significant improvement on functional scales, one patient even became

pregnant and gave birth to a child.

## Discussion

Until recently it was believed that longitudinal pancreatic pancreatojejunostomy was emerged from the arsenal of surgical operations in the HP due to a high percentage (up to 15-40%) of unsatisfactory results [14], the spread of duodenum-preserving resection of the pancreas and the emergence of other mechanisms for explaining pain other than central pancreatic duct hypertension [15].

But there is a group of patients on the CP, which shows a fairly simple artillery operation. These are patients with an enlarged major pancreatic duct without enlarging the pancreas head [16]. Moreover, 2 retrospective single-centered studies in the Freiburg University Clinic and the Hannover Medical School, which included 224 and 147 patients, showed that a higher survival rate of post-operative pain was noted when the duration of the disease was over 3 years [17, 18]. Therefore, even in recent guidelines, understanding and treatment of chronic pancreatitis pain reveal that existing data on the timing of surgical treatment in patients with CP suggests early surgery, that is, within the first 2-3 years after the diagnosis or the onset of symptoms [15]. It is precisely for the "early surgery" with CP that the implementation of LLPJS is optimal. Elimination of central pancreatic hypertension can hold back the progression of CP, prevent the development of irreversible changes in parenchyma and the inclusion of other mechanisms of pain development, such as intraparenchymal hypertension, perineural infiltration and hypertrophy of nerve fibers [15,19].

Unfortunately, the situation with patients with CP is such that they have to address to a pancreatic surgeon after prolonged exhausting treatment with substitute enzyme preparations, after endoscopic or symptomatic operations. Therefore, the selection of patients, which is possible to perform LLPJS is extremely difficult. The LLPJS itself is a technically uncomplicated procedure with sufficient laparoscopic surgery skills.

## Conclusions

Laparoscopic surgery in the treatment of chronic pancreatitis is not widespread, but attractive and opens up new opportunities for "old methods".

Laparoscopic longitudinal pancreatojejunostomy is a safe, effective and expedient operation, especially with "early chronic pancreatitis" without enlarging the head of pancreas, but requires a strict selection of patients and further research.

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