



This is English-version of “Kết quả sớm phẫu thuật cắt thân đuôi tụy bảo tồn lách” published by “Tạp chí Y Học Thành phố Hồ Chí Minh” (ISSN: 1859-1779)

## The short-term result of distal pancreatectomy with splenic preservation

Phan Minh Tri<sup>ab</sup>, Do Hoai Ky<sup>c</sup>, Vo Truong Quoc<sup>b</sup>, Doan Tien My<sup>a</sup>, Pham Huu Thien Chi<sup>a</sup>

<sup>a</sup>Hepatobiliary and Pancreatic Department, Cho Ray hospital, Ho Chi Minh city, Viet Nam;

<sup>b</sup>Department of Surgery, University of Medicine and Pharmacy at Ho Chi Minh city, Viet Nam;

<sup>c</sup>Nha Trang General Hospital, Vietnam.

Received August 07, 2019; Revised January 02, 2020; Accepted January 15, 2020

**Abstract: Introduction:** The tumor of pancreatic body and tail are relatively rare compared to those of head of pancreas. Splenic preservation in pancreatic carcinoma's surgery should be decided on every case. This study to determine the feasibility of distal pancreatectomy with splenic preservation, the rate of early complications of splenectomy surgery to preserve the spleen and the factors: tumor size, tumor location, tumor characteristic to help assess the possibility of preserving the splenic vessels in distal pancreatectomy with splenic preservation. **Methods:** retrospective study, case series description for all patients aged 16 years and older with distal pancreatectomy and splenic preservation from 01/01/2012 to 31/12/2017. **Result:** We had 47 case of distal pancreatectomy with splenic preservation. There were 26 cases of splenic preservation with preserving the splenic vessels (Kimura technique), 13 cases of splenectomy but not preserving the splenic vessels (Warshaw technique). There were 16 cases of laparoscopic surgery, 31 cases open surgery, general complication in surgery 11 cases. The mean age was 41.13 (17-76 years old). The mean hospital stay was 7.7 days (3 days - 21 days). General complication after surgery in 7 cases, pancreatic fistula in 5 cases, no cases need re-operation, no mortality. **Conclusion:** The rate of intraoperative incidence was 23.4%; complications after surgery 14.9%. No case of re-operation or mortality in the study. Factors such as tumor size, tumor location, tumor characteristic did not help assess the possibility of preserving the splenic vessels in of distal pancreatectomy with splenic preservation.

**Keywords:** pancreatic tail and body's tumor; pancreatectomy with splenic preservation.

### 1. INTRODUCTION

Pancreatic body's tumors and pancreatic caudal's tumors are approximately rare compared to pancreatic head's tumors. The cancer is often detected late, so the ability to remove tumors is not possible, especially with malignant tumors of distal pancreas.

Therefore, in the last few years, many world studies have been conducted extremely deep on the operation of distal pancreatectomy with splenic preserving, which remains safe and effective cite [1, 2]. Patients do not have to lose the physiological function of the spleen, as well as avoid

complications after splenectomy. In Cho Ray Hospital, Ho Chi Minh City, there are many studies about distal pancreatectomy, but there has not been any in-depth analysis on this problem, so we conduct the study to determine the feasibility of the distal pancreatectomy with splenic preserving, the rate of intraoperative complications, early morbidity of distal pancreatectomy with splenic preservation and whether those factors: tumor size, tumor location, tumor nature... help assessing the ability of non-splenic vasectomy in distal pancreatectomy with splenic preservation.

### 2. METHODS

\*Address correspondence to Phan Minh Tri, MD, PhD at Hepatobiliary and Pancreatic Department, Cho Ray hospital, Ho Chi Minh city, Viet Nam; E-mails: [drphanminhtri.md@gmail.com](mailto:drphanminhtri.md@gmail.com)  
 DOI: 10.32895/UMP.MPR.4.1.2

Retrospective study, descriptive case series. We had observing all patients from aging 16 years and older which had been operated distal pancreatectomy with splenic preservation from January 1, 2012 to December 31, 2017. The data were from preoperative abdomen CT scanner, pancreatectomy method and morbidity's ratio was analyzed with the difference statistically significant when  $p < 0.05$  by squared chi test.

All procedures performed in this study were in accordance with the ethical standards of the research committee (from medical university and hospital) following the 1964 Helsinki declaration, and the informed consent paper from each patient for using their data in research were signed before operation.

### 3. RESULTS

Within 6 years from January 2012 to December 2017, we collected 47 cases of distal pancreatic tumors that were undergoing laparoscopic surgery and opened surgery of distal pancreatectomy. The average age was 41.13 (17-76). Female: male = 4.9: 1. The average size of tumors was 6.9 cm, the smallest size was 1.5 cm, the largest one was 20 cm. The average operated time was 182 minutes (60 minutes - 420 minutes). The average length of hospital stay was 7.7 days (3 days - 21 days).

**Table 1:** Diagnostic imaging CT scan of preoperative abdomen

CT scan imaging	n (N =47)	Ratio %
<b>Location of tumor</b>		
Tail of pancreas	20	42.6
Body of pancreas	17	36.2
Distal pancreas	10	21.3
No tumor	0	0
<b>Tumor's characteristic</b>		
Solid tumor	15	31.9
Cystic tumor	22	46.8
Mixed tumor	10	21.3

**Table 2:** Pancreatectomy

Pancreatectomy	n (N = 47)	Ratio %
<b>Portion</b>		
Body - caudal	9	19.1
Caudal	38	80.1
<b>Pancreatectomy device</b>		
Stapler	25	53.2
Electric knife	17	36.2
Ultrasonographic knife	05	10.6
<b>Additional suture on cutting surface</b>		
Yes	21	51.1
No	22	46.8
<b>Pancreatectomy and splenic preserving type</b>		
Kimura	26	55.3
Warshaw	13	27.7
Kimura^	8	17
Warshaw		

*Operation time: Shortest: 60 minutes, the longest: 420 minutes, average: 182.45 minutes, standard deviation:  $\pm 72.45$ .*

Among these 47 cases, there were 16 cases of laparoscopic surgery, 31 cases of open surgery, intra-operated complications were in 11 cases. General complications after surgery were in 7 cases, pancreatic fistulas after surgery were in 5 cases, no case of those pancreatic fistulas had to be re-operated, no case was of death. Functional symptoms were abdominal pain at epigastric and left lower quadrant, which is also the reason for the patient to be hospitalized.

**Table 3: Morbidities**

	n (N =47)	Ratio %
Morbidities	7	14.9
Pancreatic fistula	5	10.6
Pancreatitis	2	4.3

*The length of hospital stays: the shortest (3 days), the longest (21 days), average: 7.74 days, standard deviation:  $\pm 2.92$ .*

The results of pathology: serous cystic neoplasm accounted for the largest number of cases with 18 cases, followed by pseudopapillary neoplasm are 12 cases, in which 3 cases of insulinoma.

The method of laparoscopic surgery or open surgery was related to the method of changing from non-splenectomy to splenectomy. The group of laparoscopic surgeries was changing from Kimura technique to Warshaw technique accounted for 45.5%, that was higher than the open surgery group (accounted for 13%), possibly because the surgeons were not have more experiences about split splenic vessels from pancreas through laparoscopic. This difference is statistically significant,  $p = 0.037$  ( $< 0.05$  - squared chi test).

### 4. DISCUSSION

There was no correlation between age and disease, and the disease occurred at all ages. Carricaburu E and colleagues also reported a case of 9-year-old which had been performed laparoscopic distal pancreatectomy for his pancreatic cancer in 2003. Gianluigi M and colleagues reported a case of laparoscopic distal pancreatectomy with splenic preserving for 11-year-old girls with pseudopapillary neoplasm in 2007 [3].

There are 25 cases of pancreatectomy that using stapler (accounted for 53.2%), the rest were cut with ultrasound knives or monopolar electric knives. Using stapler cut across the body of the pancreas about 2 cm away from the safety margin. All cases that using monopolar knives were found in open surgery.

Many studies show that spleen plays an important role in immunology. Observing patients with splenectomy accompanied by colectomy, gastrectomy, Mayo was the first author who described the technique of distal pancreatectomy in 1913. By 1943, distal pancreatectomy with splenic preserving was first described by Mallet-Guy and Vachon [4]. This spleen preservation technique includes the conservation of the spleen, splenic vein, which was called Kimura technique [5]. By 1988

Warsaw [6] proposed a splenic conservation technique with ligating splenic vessels.

Bleeding during surgery is unavoidable, especially in the area of the pancreas where there are many important blood vessels. In 8 (17%) cases of venous bleeding, there were 7 cases had to changing to splenic preservation method with splenic vessels ligation. There was 1 case of splenic artery bleeding and 1 case of portal venous bleeding. In that case, we had to ligate the splenic vessels and sutured the portal vein. There is 1 case of surface's dissection bleeding and splenic vein bleeding.

When compared with other authors, the general intra-operated complications according to Dai is 16%, according to author DiNorcia is 28.2%. Our common accidents were equivalent to above authors, but lower than author Nguyen Thanh Thoai with 45.2%, possibly due to more difficult laparoscopic techniques and no mortalities was recorded [2]

Two pancreatitis cases were on the second postoperated day with the symptoms of epigastric abdominal pain and fever, WBC counted above 10G/L, blood amylase > 369UI/L, both patients were treated shabbily. In the study of author Nguyen Quang Dung also has a case of pancreatitis after surgery and internal treatment has enabled [1].

This was the case with prolonged pancreatic fistula but no need for surgical intervention and was only treated successfully by internal treatment. Therefore, our average length of hospital stay is much lower than many authors. That might be due to the lower complication rates and milder complications. Compared to other authors, there was no statistically significant difference in

mean length of hospital stay between the two groups of laparoscopic surgery and open surgery.

## 5. CONCLUSION

Laparoscopic surgery or open surgery of distal pancreatectomy with splenic preserving for treating benign pancreatic body and tail's tumors can be performed safely and effectively in intensive medical centers. The rate of complications of distal pancreatectomy and splenic preserving is 23.4%; Early postoperative complications is 14.9%. No case needs re-operation. No case of death in the study. Factors such as: tumor size, tumor properties, tumor location or surgical approaching (open surgery or laparoscopic surgery) do not help assessing the splenic preservation method with or without splenic vessels conservation.

## REFERENCES

1. Nguyen Quang Dung. Evaluate the results of tumor surgery of the caudal fin. Thesis II 2015, University of Medicine and Pharmacy at Ho Chi Minh.
2. Nguyen Thanh Thoai. Results of treatment of endoscopic caudate tumors. Thesis II 2013, University of Medicine and Pharmacy at Ho Chi Minh.
3. Gianluigi M, et al. "Laparoscopic Distal Pancreatectomy in Children: Case Report and Review of the Literature". *Annals of Surgical Oncology* 2007 March, 14 (3):pp. 1065-1069.
4. Hou B., Xiong D., Chen S., et al. "Splenic vessel preservation versus splenic vessel resection in laparoscopic spleen-preserving distal pancreatectomy". 2018, 88 (6):pp. E532-e538.
5. Kimura W., Yano M., Sugawara S., et al. "Spleen-preserving distal pancreatic with conservation of the splenic and articulation of techniques and its significance". *J Hepatobiliary Pancreat Sci* 2010, 17 (6):pp. 813-23.
6. Warsaw AL. "Conservation of the spleen with distal pancreatectomy". *Arch Surg* 1988, 41:pp. 550-553.