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# SURGICAL TREATMENT FOR CYSTIC LESIONS OF THE PANCREAS

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**ABSTRACT** — During the period 2011–2021, 45 patients with pancreatic cysts were treated at the Alexander-Mariinsky Regional Clinical Hospital in Astrakhan. All patients were divided into 2 groups. 20 patients of the first group (45%) underwent external drainage of cysts, 7 out of them underwent obliteration of residual cavities by the method developed by us. To do this, the drug Povidone – Iodine 10% was used. The second group included 25 (55%) patients with internal drainage of cysts: in 5 patients (11%) pancreatocystogastrostomy was performed; in 9 patients (20%) — pancreatocystojejunostomy; in 5 patients (11%) — pancreatic drainage; in 5 (11%) — laparoscopic cystectomy; and open echinococcectomy was performed in 1 patient (2%). Clinical, laboratory, instrumental and statistical research methods were carried out. A comparative evaluation of two methods of drainage operations for pancreatic cysts showed the advantage of internal drainage over external. 7 (16%) patients had a variety of complications. The recurrence of cysts was 4 (9%) cases. All the patients recovered. There were no cases of lethality.

**KEYWORDS** — pancreatic cyst, surgical treatment, internal drainage, pancreatocystogastrostomy, pancreatocystojejunostomy.

## INTRODUCTION

To date, the number of patients with pancreatic cysts (PC) has increased. This is due both to the effective treatment of destructive forms of acute and chronic pancreatitis, and the widespread introduction of modern instrumental diagnostic methods [7, 8]. A large percentage of this disease falls on the able-bodied part of the population, due to which this problem is socially significant [8]. The main method of treatment of this pathology is surgical [1, 4, 7, 9]. Currently, there are a large number of methods for surgical treatment of pancreatic cysts, which are constantly being improved [1, 2, 3, 4, 5, 6, 8, 9, 11]. The choice of the method of surgical treatment is influenced by many factors — this is the localization of pancreatic cysts, the connection of the cystic cavity with the ductal system of the pancreas, the nearby location of organs

and vascular structures [1, 2, 9, 10]. In this regard, the choice of the method of surgical treatment of pancreatic cysts is an urgent problem [1, 10].

### *The aim of the research:*

to evaluate the results of surgical treatment methods in patients with pancreatic cysts.

## MATERIALS AND METHODS

Within the period 2011–2021, 45 patients with PC were operated on. Among them, there were 26 males (58%) and 19 females (42%). The inclusion criterion was patients with chronic PC, and the exclusion criterion was patients with cysts of tumor etiology.

By localization, head cysts were found in 22 (49%) patients, head–body cysts in 6 (13%) patients, body cysts in 9 (21%) cases, body and tail cysts in 3(7%), tail — 4 (9%) and in 1(2%) case, the cyst occupied the entire gland. The sizes of cysts ranged from 5 to 10 cm in diameter — 31 (69%) patients, more than 10 cm — 13 (29%). According to the nature of surgical interventions, the patients were divided into 2 groups. Patients from group 1 with cysts larger than 10 cm in diameter underwent surgery — external drainage (ED) — 20, 7 of which obliteration of residual cavities (ORC) was performed using the method developed by us RF Patent No. 2551189 "Method of treatment of residual cavity after marsupialization and open echinococcectomy" [4]. Patients from group 2 with cysts ranging in size from 5 to 10 cm underwent operations — internal drainage (ID) — 25.

Laboratory and instrumental research methods were used within the pre- and postoperative periods. These are biochemical blood tests, ultrasound of the abdominal cavity and retroperitoneal space, EGD (fiberopticgastroduodenoscopy), CT (computer tomography). In addition, the contents of the cyst were examined for amylase levels and bacteriological, cytological and histological studies were carried out.

## STATISTICS

For statistical analysis of the data obtained, the Statistica 12.0 program was used. (StatSoft, USA). Median (Me) and percentiles (5 and 95) were calculated for each indicator. The Mann-Whitney U criterion was used when conducting intergroup comparisons in the two study groups. The level of critical statistical significance was assumed  $p \leq 0.05$ . When conducting

intergroup comparisons in three or more groups, the Kraskel-Wallis criterion was used.

## RESULTS AND DISCUSSION

The number of male patients is one and a half times higher than the number of female patients. This is mainly due to the social status of the population. Despite the obvious superiority of male patients over female ones suffering from this disease, no significant differences were found when comparing by gender, depending on the attitude to a particular age group.

Depending on the forms of cysts, their localization, degree of maturity and connection with the ductal system, all this determined an individual approach to choosing the volume and nature of surgical interventions. ED was performed in 20 patients. The indications were unformed PC; as well as cysts not associated with the ductal system of the pancreas, as the first stage in infected cysts for subsequent more radical operations. There were 20 patients in 13 patients, simple ED cysts with cavity tamponade were performed. In 7 patients for ORC, we used a method developed by us, which consisted in 2-fold washing of the cystic cavity with a 10% povidone-iodine solution with an exposure of 15 minutes [4].

ID was performed in 25 patients. Indications were mature single cysts with their localization in the area of the head and body of the pancreas, as well as their communication with the ductal system of the pancreas.

Pancreatocystogastrostomy (PCG) was performed in 5 patients. RF Patent No. 2571711 "Method of surgical treatment of pancreatic head cysts" [5]. Pancreatocystojejunostomy (PCE) — performed in 9 patients on a disconnected loop.

Extrapancreatic location of cysts, with small sizes, retention cysts, and cysts not associated with the ductal system of the pancreas, were indications for cystectomy (CE). These operations were performed in 6 patients, of which in one case — by means of laparoscopic method.

In one case with large-sized pancreatic head echinococcosis, an open echinococcectomy was performed with drainage of the choledochus by Ker.

The indication for endoscopic transgastric drainage of pancreatic cysts was a single-chamber cyst of the pancreatic body, intimately fused with the posterior wall of the stomach. Such operations were performed in 5 patients.

The length of stay of patients in the hospital with ED with tamponade was —  $24 = 4.5$  bed days; with ED with ORC —  $12.5 = 1.2$  bed days. The length of stay of patients in the hospital with ID was  $10.6 = 1.1$  bed-days, with CE —  $15 = 4.4$  bed-days, with transgastric drainage (TGD) of PC — 10 bed days.

In the postoperative period, 7 (16%) patients had complications. ID operations turned out to be on the first place — 3 operations (23%) in patients with cyst suppuration. PCE operations were on the second place — 2 (22%) patients, with a case of bleeding in 1 patient and 1 case of sutures failure in the area of anastomosis. A relapse of the cyst occurred in 1 patient with TGD of PC. In other cases, there were no complications and no fatality cases.

There was no presence of cyst at the time of discharge in 45 patients after surgery, 41 (91%), and 4 (9%) still had a residual cavity. Among them, with external drainage with tamponade, a residual cavity was present in 3 patients, with endoscopic TGD — in 1 patient. 1 year after surgery, 38 (84.4%) patients were in satisfactory condition, there were no dyspeptic phenomena and pain syndrome, exocrine and endocrine disorders were absent. Residual cystic cavities and infiltrative changes in the pancreatic zone were not detected. 2 (4.5%) of the total number of operated patients had no cyst, but there were manifestations of chronic pancreatitis. Cyst recurrence was detected in 3 (6.6%) patients, and the residual cavity was preserved in 2 (4.5%) patients.

Within ED with obliteration of the cavity according to the developed method, the average bed days were two times less than with ED with tamponade of the cyst cavity. With endoscopic TGD, the indicators of the period of hospitalization were better, due to the low traumatism of this method and early rehabilitation, in comparison with other methods of surgical treatment. However, 1 month after the operation, a relapse of the disease occurred. In the late postoperative period, the same indicators in the internal drainage group were better than in the other group of patients.

Summing up the analysis of the results of PC treatment, we can say that the ED operations performed, although were less traumatic; however some disadvantages such as long healing of residual cavities and a high incidence of pancreatic and purulent fistulas were observed. The use of the developed method of ORC guarantees the prevention of complications and ensures rapid healing of the residual cavity.

## CONCLUSION

1. The choice of surgical intervention should be decided individually in each particular case.
2. Drainage operations are safe if there is an optimal ORC method.
3. With small-sized cysts, cystectomy is indicated.
4. With large and giant cysts, preference should be given to drainage operations.

**Table 1.** The number of patients and type of operations performed on pancreatic cysts

Type of Operation	Patients (n)	%	Average hospital stay, day, Me (5.95 percentiles)
ED (external drainage)	13	33	24 [18; 30]
Cystectomy – laparoscopically-open echinococcectomy and drainage of the choledochus by Keru	6 (5) (1)	8	16 [10; 21] $p_1 < 0,001$
ED with ORC (external drainage operations with obliteration of residual cavities)	7	18	13 [11; 15] $p_1 < 0,001$ ; $p_2 = 0,035$
Endoscopic transgastric drainage (TGD) of pancreatic cysts (PC)	5	13	11 [9; 15] $p_1 < 0,001$ ; $p_2 = 0,011$ ; $p_3 = 0,019$
ID (internal drainage): Pancreatocystogastrostomy pancreatocystojejunostomy	5 9	13 23	9 [7; 13] $p_1 < 0,001$ $p_2 = 0,002$ ; $p_3 < 0,001$ ; $p_4 = 0,004$
In total	45	100	

**Note:**  $p_1$  is the level of statistical significance of differences compared with ED;  $p_2$  is the level of statistical significance of differences compared with cystectomy;  $p_3$  is the level of statistical significance of differences compared with ED with ORC;  $p_4$  is the level of statistical significance of differences compared with endoscopic trans-ventricular drainage of pancreatic cysts. The Kruskal Wallis criterion was  $\chi^2 = 32.429$ ,  $df = 4$ ,  $p < 0.001$ .

**Table 2.** Long-term results in various operations

Type of operation	Patients (n)	%	Long-term results
ED (external drainage)	2	15,5	the presence of complaints and recurrence of the cyst
	3	23	the presence of complaints and residual cavity
	2	15,5	the presence of complaints, no cyst to be found
	6	46	No complaints and no cyst to be found
ED with ORC (external drainage operations with obliteration of residual cavities)	7	100	No complaints and no cyst to be found
Pancreatocystogastrostomy	5	100	No complaints and no cyst to be found
Pancreatocystojejunostomy	9	100	No complaints and no cyst to be found
Cystectomy	6	100	No complaints and no cyst to be found
Endoscopic transgastric drainage (TGD) of pancreatic cysts (PC)	1	20	No complaints and no cyst to be found
	1	20	No complaints, the signs of residual cavity
	3	60	No complaints and no cyst to be found
In total	45		

## REFERENCES

1. ILYASOV R.K., ODISHELASHVILI G.D. Surgical aspects of treatment of cystic forms of chronic pancreatitis. Astrakhan Medical Journal. – 2016. – Vol. 11, No. 3. P. 30–38.
2. KHATSKO V.V., ZENIN O.K., POTAPOV V.V. Surgical tactics in cases of pancreatic pseudocysts. University proceedings. Volga region. Medical sciences. 2015;(3):127–34 (In Russ.).
3. ODISHELASHVILI G.D., ZURNAJJANTS V.A., ILYASOV R.K., PAKHNOV D.V., KURTUSUNOV B.T., KCHIBEKOV E.A., DETOCHKIN A.N. A new method for surgical treatment of cysts located in the head of the pancreas. *ArchivEuroMedica* 2019. Vol. 9. No 1. P. 122–125
4. ODISHELASHVILI G. D., PAKHNOV D. V., ODISHELASHVILI L. G. A method of treatment of the residual cavity after marsupialization and open echinococcectomy. Patent RF, No. 2551189, 2015.
5. ODISHELASHVILI G. D., ILYASOV R. K. A method of surgical treatment of cysts of the pancreatic head. Patent RF, no. 2571711, 2015.

6. **ODISHELASHVILI G.D., ZURNAJJANTS V.A., KCHIBEKOV E.A., PAKHNOV, D.V., ILIASOV R.K., ODISHELASHVILI L.G.** A new way of modeling the true pancreatic cyst. *Experimental and Clinical Gastroenterology*. 2020;174(2):86–90. (In Russ.) <https://doi.org/10.31146/1682-8658-ecg-174-2-86-90>
7. **PASIN F., TANZI G., GRASSIA R.** Abdominal wall pseudocyst fluid collection: the unexpected presentation of pancreatic pseudocyst. *InternEmergMed*. 2018;13(5):801–3. <https://doi.org/10.1007/s11739-018-1830-1>
8. **PUGAEV AV., ACHKASOV E.E.** Acute pancreatitis. M.: INFRA-M; 2019. [https://doi.org/10.12737/monography\\_5bac927d4a2f73.37500387](https://doi.org/10.12737/monography_5bac927d4a2f73.37500387)
9. **RASCH S., NOTZEL B., PHILLIP V., LAHMER T., SCHMID R.M., ALGUL H.** Management of pancreatic pseudocysts-A retrospective analysis. *PLoS One*. 2017;12(9):e0184374. DOI: 10.1371/journal.pone.0184374
10. **SLED O.N., MERZLIKIN N.V., SLED N.YU., POPOV A.E., MENDELEEVA L.YA., KOSMACHENKO S.P., TUMAKOV I.O.** Surgical treatment of chronic cystic pancreatitis. *Bulletin of Siberian Medicine*. 2016. No. 2.P. 85–97
11. **YAO Y., ZHANG D., GUO J., QI K., LI F., ZHU J., ET AL.** A novel self-expanding biflanged metal stent vs tubular metal stent for EUS-guided transmural drainage of pancreatic pseudocyst: A retrospective, cohort study. *Medicine*. 2019;98(3):e14179. DOI: 10.1097/MD.00000000000014179.