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RESULTS OF SURGICAL TREATMENT OF PATIENTS WITH PANCREATIC INJURIES

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ABSTRACT — The analysis of 12 cases of surgical treatment of young male patients, with injuries of the pancreas is presented. By the nature of the injuries, half of the patients had gunshot injuries, and 4 had blunt injuries, 2 patients with stab and slash wound. All injuries were combined; with severity grades I–III according to AAST classification. All patients underwent laparoscopic procedures. In one patient distal pancreatectomy was performed, whereas in 7 patients the appropriate sutured closure and in 4 patients drainage closure were performed. In one patient, we used a gastric transplant on a vascular pedicle. This case is of particular interest, so we presented it separately.

KEYWORDS — pancreas, surgery, injury, laparoscopy.

INTRODUCTION

According to various authors, the lesion on the pancreas is quite rare and occupies the last place along with intestines, spleen, liver and kidneys injuries which represents less than 5% of abdominal trauma [1,2,3,4,5]. The existing surgical tactics are rather contradictory. Some authors consider it possible to perform primary repair operations, while others are opposed to this approach [6]. However, the experience of domestic and foreign authors shows that the risks and complications that are usually associated with reconstructive surgery may be exaggerated. Nevertheless, the question of safety and feasibility of pancreatic resection requires further study. The difficulty and uncertainty of complete hemostasis is still one of the main factors determining the restrained attitude of surgeons to resection.

PURPOSE OF THE WORK

The management of pancreatic trauma is complex. The purpose is to report our experience in the management of pancreatic trauma with consideration of morbidity and mortality.

MATERIALS AND METHODS

All patients hospitalized between 1998 and 2017 for pancreatic trauma in the clinic of the Department of Surgical Diseases of the Faculty of Dentistry of Astrakhan State Medical University were investigated. Traumatic injuries of the pancreas were classified according to the American Association for Surgery of Trauma (AAST) in five grades [3]. We observed 12 patients with pancreatic injuries. There were only male patients among them. They were distributed according their age as follows (Table 1).

According to the nature of injuries, half of the patients were with gunshot injuries, 4 — with blunt injuries (Table 2).

All injuries were combined, the localization of wounds and their size are presented in Table 3.

The size of the wounds from 1 to 2 cm prevailed among all the patients and amounted to 5 (42%) people. The most frequent lesion was to the pancreatic body — 6 (50%) patients.

RESULTS AND DISCUSSION

In seven patients, the wounds were sutured with interrupted stitches, in one case there was bleeding, as a result of which relaparotomy was performed. The bleeding was stopped by suturing the gland tissue. In one patient, in addition to the nodal suture, the peritoneum was used as a lining material, and in another, a strand of the omentum on the vascular stem was used. In one case, the gland wound was sutured with an *8-shaped suture*. In one patient a resection of the pancreatic tail with suturing of the resulting *U-shaped suture* wound was performed. In one patient, we used a gastric graft on the vascular stem. When forming a gastric graft, a serous-muscular flap with the right gastroepiploic artery was cut out from the greater curvature of the stomach. This case is of a particular interest, so it is worth being presented.

Patient P. 17 years old, IB No. 3743, was admitted to the clinic with diffuse peritonitis a day after being injured in a motor vehicle accident. The patient underwent laparoscopy, during which a sanious liquid with flakes and jelly-like clots was found in the abdominal cavity. Midline laparotomy was performed. There was a moderate amount of sero-hemorrhagic exudate in the abdominal cavity. There were multiple *stearic plaques*

Table 1. Distribution of patients by age

	males	In total
Under 20 years old	3 (25%)	3 (25%)
From 21 to 30 years old	4 (33,3%)	4 (33,3%)
From 31 to 40 yaers old	5 (42%)	5 (42%)
In total	12	12

Table 2. The distribution of the patients according to the nature of injuries

The nature of injuries	Blunt trauma	Stab and slash wound	Gunshot wounds	In total
males	4 (33,3%)	2 (17%)	6 (50%)	12

Table 3. Localization and size of wounds

Localization of wounds	Up to 1 cm	From 1 to 2 cm	From 2 to 3 cm	8 cm	The whole surface	In total
The whole pancreas					1 (8,3%)	1 (8,3%)
The body of the pancreas	1 (8,3%)	2 (17%)	3 (25%)			6 (50%)
The head of the pancreas		3 (25%)				3 (25%)
The tail of the pancreas			1 (8,3%)	1(8,3%)		
In total	1 (8,3%)	5 (42%)	4 (333%)	1 (8,3%)	1 (8,3%)	12

Table 4. Characteristics of patients who underwent laparotomy

Patient (n)	Mechanism of Injury	AAST grade	Surgical management	Postoperative complication
1	Penetrating trauma	3	Distal pancreatectomy	None
2	Motor vehicle accident	3	Suturing the wound+ gastric graft on the vascular stem	None
3	Penetrating trauma	1	Suturing the wound	Pancreatic fistula
4	Motor vehicle accident	1	Suturing the wound	None
5	Motor vehicle accident	2	Suturing the wound	acute pancreatitis
6	Motor vehicle accident	2	Suturing the wound	None
7	gunshot wound	2	Suturing the wound	peritonitis
8	gunshot wound	2	Suturing the wound	None
9	gunshot wound	2	Drainage	acute pancreatitis
10	gunshot wound	2	Drainage	None
11	gunshot wound	2	Drainage	peritonitis
12	gunshot wound	2	Drainage	intra-abdominal bleeding

on the large and small omentum. The omentum sac was opened, and a large amount of cloudy effusion was released. The revision revealed a large retroperitoneal hematoma extending to the small omentum and mesenteric root. After opening the posterior peritoneum above the pancreas, a complete transverse rupture of its body was found at the borders of the head and body.

The gland was hyperemic with areas of necrosis at the site of rupture. An attempt to isolate the Wirsung duct failed due to rapid infiltration of glandular tissues and of uprisal bleeding. The bleeding was stopped. Necrotic tissues were removed and the wound surface of the distal part of the pancreas was covered with a gastric graft. After the mobilization of the pancreatic body, it was possible to detect the Wirsung duct with a diameter of up to 0.8 cm. A chlorvinyl tube was inserted into its lumen, which was removed in the left hypochondrium. Interrupted stitches were applied to the proximal part. A month after the discharge, the patient developed clinical signs of acute adhesive intestinal obstruction. Relaparotomy was performed. During the revision, the cause of the obstruction was a tube that drained the duct, and good engraftment of

the gastric graft was noted in the area of the previous operation. The gastric graft had a normal color, without signs of swelling. Adhesions were dissected, intestinal obstruction was eliminated. It was decided to transfer external drainage to the internal one. Pancreaticogastrostomy was performed. The patient made an uneventful postoperative recovery.

In this case, we observed good engraftment of the gastric graft against the background of existing diffuse peritonitis, that is, in conditions of infection of the abdominal cavity. The distal part of the gland was sutured with interrupted stitches. Organ-preserving surgery was also performed in order to avoid unnecessary splenectomy and possible violation of the endocrine function of the pancreas.

During repeated surgery for intestinal obstruction, the external pancreatic fistula was transferred to the internal one, not only because of the high degree of physiology of this method of drainage, but also for reasons of preventing repeated adhesive intestinal obstruction.

The postoperative period was difficult in 6 (50%) patients: 2 (17%) of them had acute pancreatitis; 1 (8,3%) pancreatic fistula; 2 (17%) diffuse peritonitis; 1 (8,3%) bleeding.

The findings reveal two lethal cases among our patients. In the first patient there were acute post-traumatic pancreatitis, pancreatic necrosis, diffuse purulent-fibrinous peritonitis, multiple organ failure and intoxication. The second patient had a complete rupture of the pancreatic body. He developed diffuse purulent-fibrinous peritonitis, multiple organ failure, and cerebral oedema.

CONCLUSION

Operative management of pancreatic trauma may lead to a higher mortality. This must not be necessarily related to the pancreas injury alone but due to the associated injuries such as liver, spleen and vascular traumas are more likely to occur with severe outcomes.

As stated above, pancreatic injuries are quite rare. Nevertheless, they are of particular interest, as they may develop severe and sometimes even fatal complications. The gastric graft acts as a barrier to prevent the leakage of pancreatic fluid. It promotes hemostasis, due to the improvement of vascularization and nutrition of pancreatic tissues. Moreover, the gastric graft contributes to a more rapid subsidence of pancreatitis, whose manifestations are clinically shown. It should be noted that the postoperating period was uneventful and it required less hospital stay after the surgery. The presented data and the methods of performing a gastric graft on the vascular stem in cases of pancreatic damage can be recommended for clinical practice.

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