

Three-port retroperitoneoscopic necrosectomy in management of acute necrotic pancreatitis

Audrius Šileikis^{1,2}, Virgilijus Beiša^{1,2}, Gintaras Simutis^{1,2},
Albinas Tamošiūnas³, Kęstutis Strupas^{1,2}

¹Clinic of Gastroenterology, Nephrourology and Surgery, Faculty of Medicine, Vilnius University,

²Center of Abdominal Surgery, Vilnius University Hospital Santariškių Klinikos,

³Faculty of Medicine, Vilnius University, Lithuania

Key words: acute pancreatitis; necrosectomy; retroperitoneoscopy.

Summary. *Introduction.* Because of major morbidity and mortality after open surgery in acute necrotic pancreatitis, an interest in minimally invasive necrosectomy approaches has increased. We report the results of a recently developed minimally invasive technique that we adopted in 2007.

Material and methods. This article contains a retrospective analysis of cases and description of original retroperitoneoscopic necrosectomy technique. There were eight patients aged 25–58 years, who underwent retroperitoneoscopic pancreatic necrosectomy in the Center of Abdominal Surgery, Vilnius University Hospital Santariškių Klinikos, between 2007 and 2009. All patients had at least 30% pancreatic necrosis with extensive retroperitoneal fluid collections on the left side, proved by CT scan. Operations were performed on the 21st–56th days of illness (median, 36th day).

Results. The mean postoperative hospital stay was 49 days (range, 14–99 days). All patients survived. Two patients underwent three additional procedures; two patients, one additional procedure due to remaining infected necrosis. Three patients had no requirement for additional procedures. One patient underwent laparotomy because of bleeding.

Conclusions. We assume that minimally invasive techniques should be considered a first-choice surgical option in patients with acute necrotic pancreatitis, whenever it is possible. Pancreatic necrosis less than 30% with large fluid collections in the left retroperitoneal space facilitates employment of three-port retroperitoneoscopic necrosectomy.

Introduction

In abdominal surgery, also in pancreatic surgery, minimally invasive methods are more widely used. They have many advantages in comparison with open surgery such as reduced inflammatory response to intervention (1–3), considerably reduced extent of bacteriemia, reduced risk of development of multi-organ failure, reduced rate of postoperative respiratory and wound complications (4, 5), shorter stay in an intensive care unit (ICU), and faster convalescence (5). A number of options exist today including percutaneous CT- or ultrasound-guided drainage, endoscopic pseudocystogastrostomy or necrosectomy, various laparoscopic techniques (transperitoneal, transgastric, or retrogastric-retrocolic), translumbar retroperitoneal endoscopic necrosectomy, and retroperitoneoscopic necrosectomy (5, 6). Regrettably, there is no gold standard because of lack of studies, comparing minimally invasive techniques together and with open surgery. Even the UK Working Party on Acute Pancreatitis recommends selecting surgical technique for necrosectomy depending on individual features and locally available expertise (7).

Patients and methods

We performed a retrospective analysis of eight patients who underwent a retroperitoneoscopic pancreatic necrosectomy in the Center of Abdominal Surgery, Vilnius University Hospital Santariškių Klinikos, between 2007 and 2009. There were six males and two females aged between 25 and 58 years. In seven cases, pancreatitis was caused by alcohol consumption; in one case, by gallstones. Two patients had pancreatic necrosis in the pancreatic head and tail (>50% and 30–50%), two patients had 30–50% pancreatic necrosis in the pancreatic body and tail, and four patients had >30% pancreatic necrosis in the pancreatic tail. In all cases, necrosis was proved by CT scan. Seven patients had extensive retroperitoneal phlegmon on the left side, and one patient on both sides. Operations were performed on the 21st–56th day of illness (average, 36th day), after infection of pancreatic necrosis was proved by fine-needle aspiration under ultrasound guidance. We used an original technique, developed in our center. A patient was placed in the right lateral decubitus position and bent at the waist with help

Correspondence to A. Šileikis, Center of Abdominal Surgery, Vilnius University Hospital Santariškių Klinikos, Santariškių 2, 08611 Vilnius, Lithuania. E-mail: audrius.sileikis@santa.lt

Adresas susirašinėti: A. Šileikis, Vilniaus universiteto ligoninės Santariškių klinikų Pilvo chirurgijos centras, Santariškių 2, 08611 Vilnius. El. paštas: audrius.sileikis@santa.lt

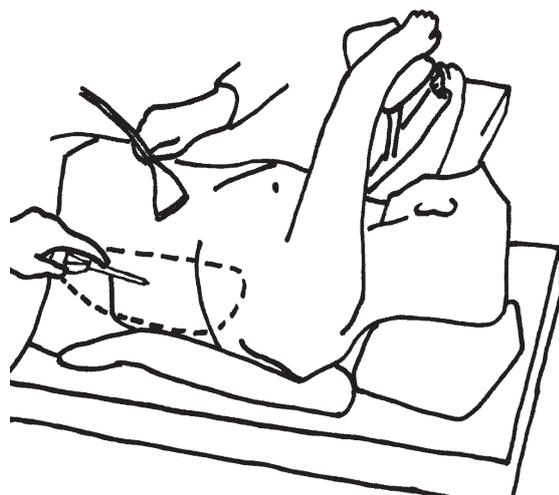


Fig. 1. Trocar introduction into retroperitoneal fluid collection under ultrasound guidance



Fig. 2. Placement of videoscope, suction irrigator, and forceps during retroperitoneoscopic necrosectomy

of a roll. The first 10-mm trocar was inserted into retroperitoneal fluid collection on the left medium axillary line near the ending of 12th rib under ultrasound guidance (Fig. 1). Pneumoretroperitoneum should be created (up to 14 mm Hg). Then 10-mm video scope can be introduced to evaluate the cavity and content. Next two trocars were inserted under videoscope guidance on the left anterior axillary line and the left posterior axillary line, respectively. Suction irrigator and forceps were introduced through these trocars (Fig. 2); then necrotic debris and pus were evacuated under visual guidance. Finally, the drains were placed through the sites of trocar puncture, and on the next day, continuous lavage of the cleansed cavity was started. If purulent fluid collections extended to the minor pelvis, the fourth drain was placed there. During repeated retroperitoneoscopic necrosectomies, the trocars were inserted through the same apertures along with drain tracts.

Results

Table presents details about our patients and management results compared with other studies. All eight patients who underwent retroperitoneoscopic necrosectomies survived. Postoperative hospital stay ranged from 14 to 99 days (median, 49 days). Two patients – one with 50% pancreatic necrosis and fluid collections in the mesentery and both the retroperitoneal spaces and another with 30–50% pancreatic necrosis – underwent two repeated retroperitoneoscopic necrosectomies and finally laparotomy and necrosectomy due to remaining infected necroses in the pancreatic head. Other two patients (30–50% and >30% pancreatic necrosis) for the same reason underwent only one repeated retroperitoneoscopic necrosectomy. Three patients had no requirement for additional procedures. One patient underwent laparotomy because of bleeding on the 30th postoperative day. Operations with minor pancreatic

Table. Comparison of our data with other series of retroperitoneoscopic necrosectomies

Series	No. of patients	No. of sessions	Preoperative disease duration, days	Postoperative hospital stay, days	Mortality, %	Complications
Carter et al. (12)	10	1–4	40	42	20	One case of bleeding
Connor et al. (13)	21	1–8	–	51	25	Three cases of sepsis, two cases of bleeding
Risse et al. (14)	6	1–4	48	27	17	One case of peritonitis, one case of pyrexia, one case of colcutaneous fistula, one case of flank hernia
Our data*	8	1–3	36	49	0	One case bleeding, four cases of sepsis

*Center of Abdominal Surgery, Vilnius University Hospital Santariškių Klinikos.

necrosis and considerable fluid collection in the left retroperitoneal space were most successful.

Discussion

Open surgery for pancreatic necrosis is associated with considerable morbidity (31–84%) and mortality (15–42%) (6, 8–11); therefore, recently in our center, whenever it is possible, we try to manage acute necrotic pancreatitis with minimally invasive procedures. Laparoscopic transabdominal access causes reduced operative injury, postoperative pain, and herniation rate in comparison with open surgery. Major disadvantages are limited operative field, complicated evacuation of viscous content, contamination of peritoneal cavity, remaining likelihood of pancreatic and enterocutaneous fistulas (8). Retroperitoneoscopic necrosectomy not only reduces operative injury, but also prevents contamination of the peritoneal cavity and abdominal wall defects (5, 8). In fact, case reports and small series show encouraging results, but no significant data are available yet (Table). Furthermore, retroperitoneoscopic necrosectomy is not applicable for all patients. Obviously, successful procedure is determined by localization of fluid collection and possibility of safe drain placing without injury to the internal organs (3). Performing this procedure according to the technique proposed by Carter et al. (12), an essential condition is the introduction of a guidewire under CT guidance. Meanwhile, we propose a considerably cheaper technique without CT and guidewire, introducing trocars under ultrasound guidance. On the other hand, distinct trocar locations allow better

manipulation potential. Retroperitoneoscopic necrosectomy according to our technique was especially effective in cases of large fluid collections without considerable capsule. When necrosis is multifocal, discontinuous, extending into both retroperitoneal spaces, located in the head or uncinat process of the pancreas, the possibility of retroperitoneal access extremely decreases. Also, very thick fibrosis or edema reduces likelihood of success (3, 13, 14). This was proved by our own experience when the attempt to perform retroperitoneal necrosectomies in two patients on 98th and 112th day of illness, when retroperitoneal necroses were confined with a thick capsule and were hardly accessed through the lumbar region, has failed.

If retroperitoneoscopic necrosectomies are insufficient and septic sources persist, patients are scheduled for conventional open surgery. However, timing of these open surgeries is considerably later, so the likelihood for intraoperative complications characteristic of open surgeries is reduced, systemic inflammatory response is managed, and patients recover more quickly. These points are substantial to reducing mortality (5, 15–17).

Conclusions

We assume that minimally invasive techniques should be considered a first-choice surgical option in patients with acute necrotic pancreatitis, whenever it is possible. Pancreatic necrosis less than 30% with large fluid collections in the left retroperitoneal space facilitates employment of three-port retroperitoneoscopic necrosectomy.

Ūminio nekrozinio pankreatito gydymas retroperitoneoskopine nekrozektomija trimis troakarais

Audrius Šileikis^{1,2}, Virgilijus Beiša^{1,2}, Gintaras Simutis^{1,2},
Albinas Tamošiūnas³, Kęstutis Strupas^{1,2}

¹Vilniaus universiteto Medicinos fakulteto Gastroenterologijos, nefrourologijos ir chirurgijos klinika,

²Vilniaus universiteto ligoninės Santariškių klinikų Pilvo chirurgijos centras, ³Vilniaus universiteto Medicinos fakultetas

Raktažodžiai: ūminis pankreatitas, nekrozektomija, retroperitoneoskopija.

Santrauka. *Įvadas.* Dėl didelio mirštamumo ir sergamumo po atvirų ūminio nekrozinio pankreatito operacijų vis didesnis dėmesys skiriamas minimaliai invaziniams nekrozektomijų būdams. 2007 m. Pilvo chirurgijos centre įdiegėme naują retroperitoneoskopinės nekrozektomijos metodiką.

Metodika. Pateikiama retrospektyvioji atvejų apžvalga bei originalios retroperitoneoskopinės nekrozektomijos metodikos aprašymas.

Tirtųjų kontingentas. 2007–2009 m. Vilniaus universiteto Pilvo chirurgijos centre, Vilniaus universiteto ligoninės Santariškių klinikose retroperitoneoskopinės nekrozektomijos buvo atliktos aštuoniems ligoniams, kurių amžius nuo 25 iki 58 metų. Visų ligonių kasos nekrozės įrodytos KT, apimančios daugiau nei 30 proc. kasos, su ryškia kairės pusės retroperitonine skysčių sankaupa. Operacijos atliktos 21–56 ligos parą, vidutiniškai – 36 parą.

Rezultatai. Po operacijos ligoniai gydyti 14–99 paras, vidutiniškai – 49 paras. Visi ligoniai išgyveno. Dviem ligoniams atliktos trys pakartotinės nekrozektomijos, dviem ligoniams dėl išlikusių infektuotų ne-

krozių atlikta po vieną pakartotinę retroperitoneoskopinę nekrozektomiją. Trims ligoniams užteko vienos operacijos. Dėl kraujavimo vienam ligoniui teko atlikti laparotomiją.

Išvados. Manome, kad, esant galimybėms, ūminio nekrozinio pankreatito chirurginį gydymą reikėtų pradėti nuo minimaliai invazinių procedūrų. Palankiausias sąlygos trijų troakarų retroperitoneoskopinei nekrozektomijai – kasos nekrozė iki 30 proc. su didelėmis skysčio sankaupomis kairiajame retroperitoniniame tarpe.

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