

Case Report

<https://doi.org/10.23934/2223-9022-2023-12-2-316-321>

Transpapillary Pancreatotomy in an Emergency Hospital

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ABSTRACT Endoscopic pancreatotomy is a highly informative method for visualizing the pancreatic ducts, which allows them to be accurately diagnosed and treated in a minimally invasive way. The SpyGlass direct imaging system is currently the most widely used device. Specially designed endoscopes and smaller diameter instruments allow direct visualization of the bile and pancreatic ducts to be performed. In this article, the first clinical case of successful direct visualization with SpyGlass is reported, which was conducted in the SBHI N.V. Sklifosovsky Research Institute for Emergency Medicine in a patient with chronic calcifying pancreatitis complicated by wirsungolithiasis.

Keywords: pancreatotomy, wirsungolithiasis, stenting, lithoextraction

For citation Generdukayev LL, Teterin YuS, Blagovestnov DA, Yeletskaia ES, Nugumanova KA, Yartsev PA. Transpapillary Pancreatotomy in an Emergency Hospital. Russian Sklifosovsky Journal of Emergency Medical Care. 2023;12(2):316–321. <https://doi.org/10.23934/2223-9022-2023-12-2-316-321> (in Russ.)

Conflict of interest Authors declare lack of the conflicts of interests

Acknowledgments, sponsorship The study has no sponsorship

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MPD - main pancreatic duct

CT - computed tomography

MRI - magnetic resonance imaging

CP - chronic pancreatitis

EGDS - esophagogastroduodenoscopy

EPST - endoscopic papillosphincterotomy

ERPG - endoscopic retrograde pancreatography

INTRODUCTION

Chronic diseases of the pancreas, in most cases the outcome of acute pancreatitis, are becoming an urgent medical and social problem in developed countries. Among the population of European countries, the main causes of pancreatitis remain cholelithiasis and alcoholism, the proportion of which reaches about 90%. There are no such epidemiological studies in Russia. Predicting the outcome of acute destructive pancreatitis is extremely difficult. It has been established that 6–9% of patients die, 18–33% recover without loss of gland function and clinical consequences, and in 55–70% there is a chronicity of the process with the outcome in various morphological types in the form of widespread fibrosis and calcification of the parenchyma, cysts, external and internal fistulas of the pancreas, ductal strictures, virsungolithiasis or persistent pain syndrome [1].

Most often, patients with chronic pancreatitis (CP) are treated conservatively. Until now, for complicated forms associated with impaired outflow of pancreatic juice, the method of choice has been surgical treatment. One of the indications for surgical treatment is Wirsungolithiasis, in particular impacted stones of the Wirsung duct. With such pathology, internal drainage operations are performed (pancreaticojejunostomy according to Duval or Puestow) [2, 3].

Virsungolithiasis is one of the complications of CP. The formation of calculi in the lumen of the pancreatic duct leads to disturbed outflow, which results in an increase in intraductal pancreatic pressure [4, 5]. In order to diagnose calculi in the lumen of the pancreatic duct, non-invasive research methods are used: ultrasonography, computed tomography (CT), magnetic resonance imaging (MRI), endoscopic ultrasonography. In the last few years, the development of minimally invasive interventions aimed at lithoextraction from the pancreatic ducts with subsequent decompression of intraductal pancreatic hypertension has been noted [5, 6]. Over the past 5 years, oral endoscopic transpapillary cholangiopancreatography has been actively introduced.

In addition, according to some authors, in CP (especially with virsungolithiasis), endoscopic treatment is indicated in the amount of endoscopic papillosphincterotomy (EPST), wirsungotomy, lithoextraction, and sanitation of the pancreatic duct, which makes it possible to achieve treatment results comparable to those of open interventions [7, 8].

Endoscopic pancreatoscopy is a highly informative method for visualizing the pancreatic ducts, which allows them to be accurately diagnosed and treated using minimally invasive methods. The SpyGlass direct imaging system is currently the most widely used device. Specially designed endoscopes and smaller diameter instruments allow direct visualization of the bile and pancreatic ducts (cholangioscopy and pancreatoscopy) [5, 6, 9, 10].

Endoscopic pancreatoscopy has two main diagnostic indications. Firstly, it is used for visualization and histological diagnosis of intraductal papillary-mucinous neoplasms. Secondly, this method is used to determine the strictures of the main pancreatic duct of the pancreas, which is especially important in cases of CP, which is associated with both benign and malignant strictures. Pancreatography can also be used therapeutically, such as in pancreatoscopy-guided lithotripsy for CP with pancreatic duct stones. Current data suggest that pancreatoscopy plays an important and promising role in the diagnosis and treatment of pancreatic disease in selected patients. However, further studies are needed to clarify and confirm the role of pancreatoscopy in the therapeutic algorithm for CP [11].

In 2021, a successful oral endoscopic transpapillary pancreatoscopy was performed for the first time at the Sklifosovsky Institute, using the SpyGlass system for direct visualization of the main pancreatic duct in a patient with chronic calcific pancreatitis.

Clinical observation

A 63-year-old male patient D. was admitted on November 11, 2021 to the Research Institute for Emergency Medicine with complaints of pain in the upper abdomen and nausea. From the anamnesis it is known that he was repeatedly treated in hospitals for acute pancreatitis. Operations: in 2000, a laparotomy for a pseudocyst of the pancreas (the patient does not know the exact volume and name of the operation, does not provide medical documents).

When performing ultrasound, echo-signs of diffuse changes in the liver, exacerbation of chronic calcific pancreatitis were described (the echostructure is diffusely heterogeneous, with areas of reduced echogenicity, hyperechoic inclusions are located, in the area of the head there is an area of the parenchyma of increased echogenicity, the capsule is edematous, the Wirsung duct is up to 0.6 cm, in the projection on the anterior surface of the head, a hypoechoic area is located (with color Doppler coding without blood flow) of a deformed congestive gallbladder).

Computed tomography (CT) of the abdominal organs revealed signs of chronic calcified pancreatitis, dilation of the Wirsung duct, residual macrofocal pancreatic necrosis, and severe pancreatic hypertension.

According to laboratory studies in the general blood test: hemoglobin 159.0 g/l; RBC 5.18×10^{12} /l; hematocrit 47.5%; blood biochemistry: total bilirubin 10.5 $\mu\text{mol/l}$, direct bilirubin 3.6 $\mu\text{mol/l}$, indirect bilirubin 6.9 $\mu\text{mol/l}$; alpha-amylase 332.0 U/l; glucose 6.62 mmol/l; total protein 78.0 g/l; albumin 41.0 g/l; creatinine 69.5 $\mu\text{mol/l}$; urea 4.33 mmol/l; alkaline phosphatase 69.0; aspartate aminotransferase 20.0 U/l; alanine aminotransferase 17.00 IU/l.

Data from instrumental and laboratory studies correspond to the significance of chronic calcific pancreatitis in the acute stage and pancreatic necrosis. CT scan also revealed signs of severe pancreatic hypertension. In the department, the patient received infusion, antispasmodic, antisecretory, and analgesic therapy. To determine further surgical tactics, the patient was prescribed additional examination: esophagogastroduodenoscopy (EGDS), endosonography of the pancreatobiliary area.

When performing endoscopy, the patient was diagnosed with catarrhal duodenitis, superficial gastritis, cicatricial deformity of the antrum of the stomach and pylorobulbar zone, duodenogastric reflux. Duodenoscopy revealed no pathology of the major duodenal papilla. Endosonography of the pancreatobiliary zone revealed signs of calcific pancreatitis and pancreatic necrosis (pancreatic tissue of a heterogeneous structure, predominantly increased echogenicity, with multiple hyperechoic inclusions that give an acoustic shadow, and small rounded and irregularly shaped anechoic zones in all departments), wirsungectasia, and sludge in the gallbladder.

Based on the results of the performed studies, the patient was scheduled for endoscopic retrograde pancreatography (ERPG), endoscopic papillosphincterotomy (EPST), endoscopic oral transpapillary pancreatoscopy, endoscopic lithotripsy, and stenting of the main pancreatic duct of the pancreas.

The patient underwent endoscopic stenting of the main pancreatic duct, ERPG, EPST, endoscopic oral transpapillary pancreatoscopy, endoscopic lithoextraction, stenting of the main pancreatic duct.

Surgery was performed under endotracheal anesthesia with the patient in the supine position. For this purpose, an Olympus TJF - Q 180 V video duodenoscope, an EXERA III video endoscopic system, and a SpyGlass video system were used.

After passing the distal end of the duodenoscope into the descending part of the duodenum and visualizing the major duodenal papilla, its size, shape, and color of the mucous membrane were assessed. Next, a 0.35-inch wire guide was inserted through a catheter into the orifice of the major papilla and the main pancreatic duct was cannulated. After that, under the control of fluoroscopy, it was contrasted with 76% water-soluble contrast agent "Urografin", diluted with 0.1% dioxidine solution in a ratio of 1:3 in a volume of 3–5 ml. After contrasting the Wirsung duct, its contours, diameter, and the presence of filling defects were assessed.

On the presented pancreatograms, the Wirsung duct is expanded to 1.1–1.2 cm, and contrasting of the accessory ducts is also noted, expanded to 0.5 cm. up to 1.7 cm, with clear, even contours (Fig. 1).

The patient underwent wirsungotomy up to 1.2 cm, after which balloon dilatation of the mouth of the main pancreatic duct (MPD) was performed (Fig. 2).

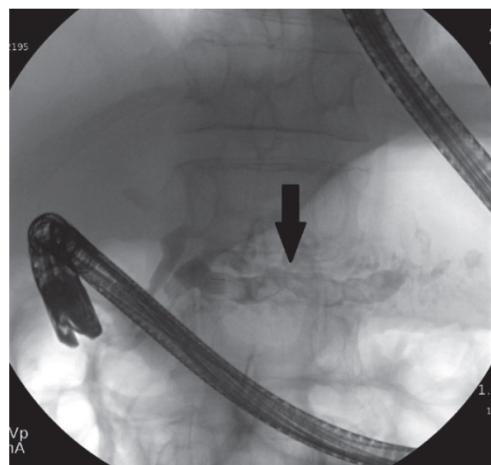


Fig. 1. Pancreatogram. The arrow indicates the main pancreatic duct



Fig. 2. Endoscopic photo of wirsungotomy

Using the SpyGlass system, pancreatoscopy was performed: the mucous membrane of the pancreatic ducts was pale. In the lumen of the MPD and the efferent ducts, multiple calculi (7–8) with a diameter of 0.5 to 1.0 cm were identified (Fig. 3).

A lithoextraction basket was inserted along the conductor string into the lumen of the MPD (Fig. 4). During the revision, a large number of fragmented calculi of soft consistency were identified in the amount of 6–7 with a diameter of up to 0.8 cm (Fig. 5). Sanitation was performed with a sterile saline solution of 60 ml.

After performing lithoextraction from the Virunga duct, control contrasting of the pancreatic duct was performed. No data were received regarding the presence of stones. A small number of gas bubbles is determined in the lumen of the MPG in the middle sections (Fig. 6).

For adequate drainage, pancreatoduodenal stenting was performed. Under x-ray control, a plastic pancreatic stent 8 cm long and 7 Fr in diameter was inserted into the lumen of the MPD into the body area under X-ray guidance (Fig. 7). The stent marked the flow of pancreatic juice. When performing a control radiograph, a partial discharge of the contrast agent along the stent into the lumen of the duodenum was noted, with a delay of a small amount of the drug in the lumen of the additional ducts.

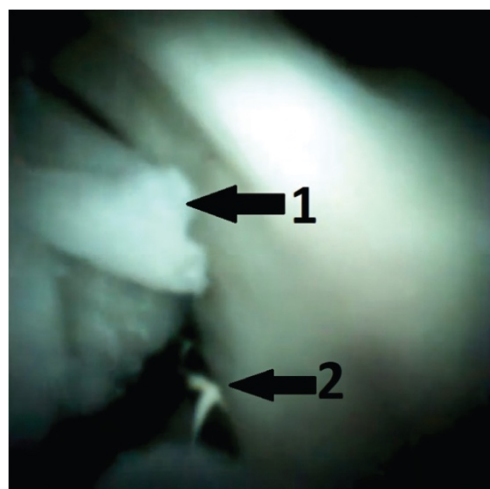


Fig. 3. Pancreatography. The arrows indicate: 1 — calculus; 2 — conductor string

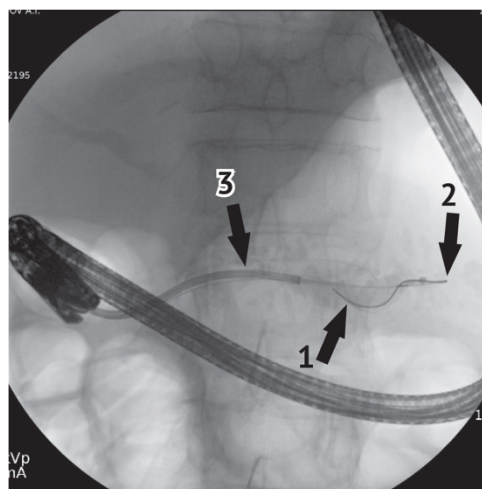


Fig. 4. Pancreatogram. Arrows indicate: 1 — conductor string; 2 — lithoextraction basket; 3 — SpyGlass

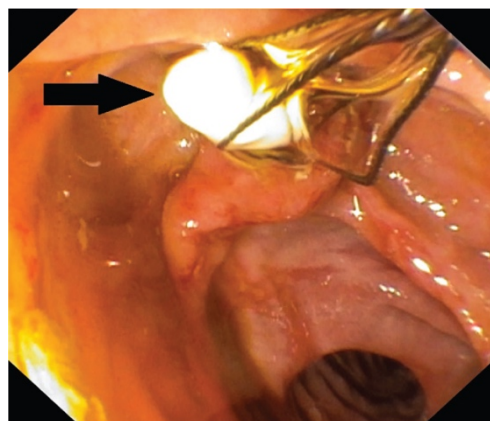


Fig. 5. Endoscopic photo. The arrow indicates the calculus

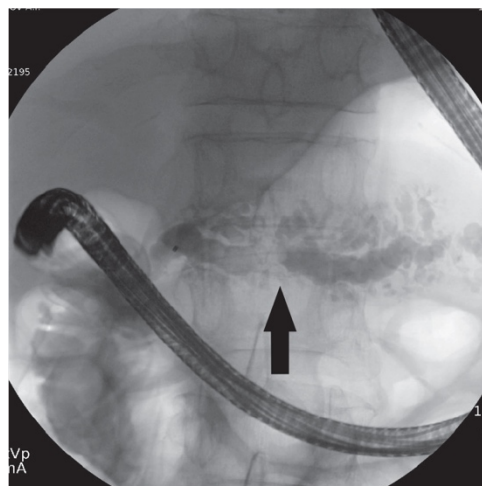


Fig. 6. Test pancreatogram. In the middle sections, a filling defect due to air bubbles is visualized (arrow)

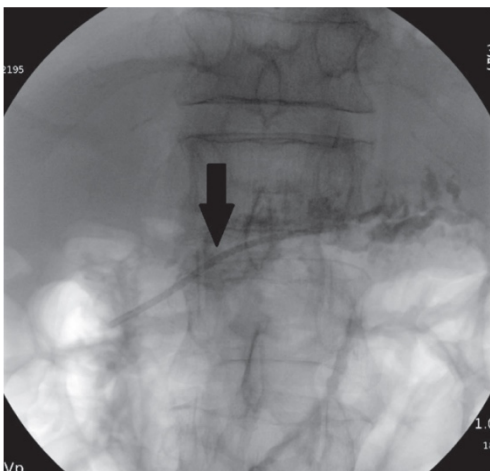


Fig. 7. Pancreatogram. The arrow indicates the pancreatoduodenal stent

In the postoperative period, infusion analgesic antibiotic therapy was performed.

Against the background of the ongoing complex treatment, the patient showed positive dynamics.

On the 12th day, due to improvement and lack of indications for further stay in a surgical hospital, the patient was discharged under outpatient supervision of a surgeon, therapist, endocrinologist at the place of residence.

CONCLUSION

Our first experience of using oral transpapillary pancreatoscopy using the digital system "SpyGlass" demonstrates its high diagnostic value and the possibility of its use in routine emergency hospital practice.

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Received on 03/03/2022

Review completed on 05/26/2022

Accepted on 03/28/2023