

## **Endovascular Method of Bleeding Control in Pancreatic Necrosis: Two-Year Single-Centre Experience**

**Archili Miminoshvili\*, Omari Miminoshvili, Sergey Yaroschak and Kyrylo Holubytsky**

*Institute of Urgent and Recovery Surgery of V.K. Gusak of National Academy of Medical Sciences of Ukraine, Donetsk, Ukraine*

**\*Corresponding Author:** Archili Miminoshvili, Surgeon of Abdominal Surgery and Polytrauma, Institute of Urgent and Recovery Surgery of V.K. Gusak of National Academy of Medical Sciences of Ukraine, Donetsk, Ukraine.

**Received:** October 03, 2018; **Published:** October 30, 2018

### **Abstract**

**Objective:** The aim of the work is to determine surgical tactics in the treatment of patients with pancreatic necrosis complicated by spontaneous bleeding. An estimated 257 million people are living with HBV infection resulting in about 887,000 deaths per year from Cirrhosis and hepatocellular carcinoma.

**Summary Background Data:** Reducing the risk and trauma of surgical intervention by using modern minimally invasive techniques in acute pancreatitis is one of the promising areas for improving the diagnosis and treatment of its complicated forms.

**Methods:** After catheterization of the right femoral artery with Seldinger technique, a catheter was inserted in celiac trunk and the celiacography was performed. An X-ray contrast study was performed at the peak of bleeding to detect extravasation of the contrast substance. Therefore, we used Siemens Axiom Artis device for angiography. In order to stop bleeding the contour emboli was used. After the artery embolization, the bleeding was stopped.

**Results:** The proposed method of bleeding control was applied in 5 patients with pancreatic necrosis. All patients received good immediate results - complete and stable hemostasis.

**Conclusions:** Spontaneous bleeding is a serious complication of the pancreatic necrosis which often leads to unfavorable results. The use of an angiographic method of bleeding control allowed to localize the source of bleeding efficiently and less traumatically, that ultimately leads to a mortality reduction in these patients.

**Keywords:** *Bleeding Control; Pancreatic Necrosis*

### **Introduction**

The treatment of the complicated forms of acute pancreatitis is the most puzzling issue of pancreatology [1-5]. Pancreatic necrosis is characterized by severe complications and high lethality rate, which is about 60 - 85% [1-5].

Purulent septic inflammation, which is an integral part of the course of pancreatic necrosis, often leads to damage of blood vessels with sudden massive bleeding and can give a fatal outcome. In spite of the fact that practically every work devoted to pancreonecrosis mentions this complication, questions of strategy and methods of the bleeding control are not adequately covered and do not give a holistic perception of this problem [1,3,4].

The unresolved questions explain the attention of physicians to the search for new tactical approaches in the diagnosis and treatment of hemorrhagic complications in pancreatic necrosis. The results of repeated operations aimed at control the erosive bleeding are not always satisfied with the surgeons and many surgical procedures should be performed to get stable haemostasis.

Reducing the risk and trauma of surgical intervention by using modern minimally invasive techniques in acute pancreatitis is one of the promising areas for improving the diagnosis and treatment of its complicated forms [6-8].

### Methods

From 2015 to 2017 in Institute of Urgent and Recovery Surgery of V.K. Gusak (Ukraine) there were 44 patients who had pancreatitis complicated by pancreatic necrosis. Of these, men were 36 (81.8%), women 8 (18.2%). Patients received standard therapy with the use of anti-secretory agents, protease inhibitors, anti-oxidants and antibacterial treatment. All patients were operated after the appearance of clinical manifestations of the destructive process in the pancreas. The draining of pancreatic abscesses, retroperitoneal phlegmon, and pancreatic necrosectomy were performed. 41 patients (93.2%) underwent relaparotomy with the aim of planned necrosectomy and drainage replacement. In 9 patients (20.4%) with pancreatic necrosis, the postoperative period was complicated by the bleeding due to the vessels erosion.

During the verification of the source of bleeding, we encountered certain difficulties. In conditions of destructive changes in the pancreas and retroperitoneal space, it was challenging to localize the source of bleeding, sometimes even impossible. Therefore, in most cases, the source of bleeding was determined indirectly by topographic features, the intensity of hemorrhage and the color of the bleeding.

### Results

The study showed that bleeding due to pancreatic necrosis is characterized by unpredictable onset, in most cases with significant intensity and tendency to recurrence, sometimes it is difficult to localize and carry out an effective haemostatic therapy.

To reach a stable hemostasis (without recurrence of bleeding) by conservative therapy in patients with pancreatic necrosis is a very tough task. According to our data, the bleeding in pancreatic necrosis in all cases tends to recur. Often repeated massive bleeding significantly depletes the already weakened organism of the patient, contributing to the development of other complications and death.

So, in 1 patient there were 2 episodes of bleeding, in 4 - three episodes, in 3 - four and in one patient there were six episodes of bleeding. Repeated bleeding developed in the time period from 10 hours to 9 days from the previous hemorrhage.

The moments mentioned above forced us to search for new ways of effective bleeding control. The introduction of modern research methods into practice allowed not only to accurately diagnose, but also to clearly identify the source of bleeding and conduct effective measures to stop it. Therefore, we used Siemens Axiom Artis device for angiography.

The method of the study was carried out as follows: with the development of bleeding in a patient with pancreonecrosis, he was taken to the operating room. After catheterization of the right femoral artery with Seldinger technique, a catheter was inserted in celiac trunk and the celiacography was performed. An X-ray contrast study was performed at the peak of bleeding to detect extravasation of the contrast substance.

Figures 1 and 2 present a contrast study of the celiac trunk in a patient 43 years old, who entered the clinic with severe alcoholic pancreatitis 3 days after the onset of the disease. The patient was operated on with laparoscopic lavage and the drainage of the abdominal cavity and bursa omentalis.

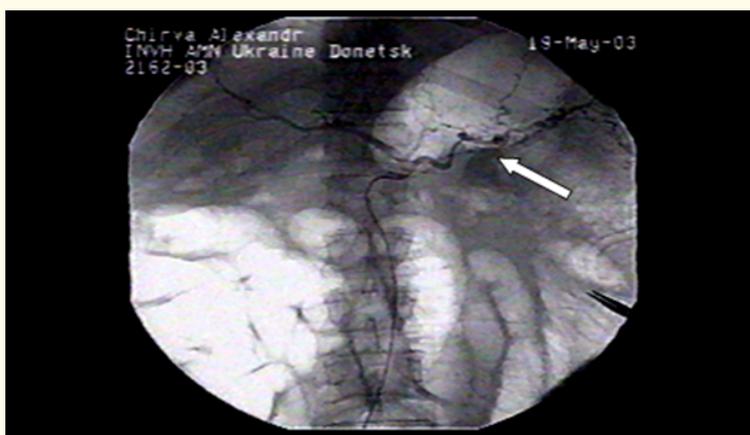
Subsequently, despite adequate conservative therapy, the patient developed pancreatic necrosis with retroperitoneal phlegmon and symptoms of sepsis. According to the computed tomography, the signs of destructive pancreatitis, infiltrate of retroperitoneal space with a leak on the left flank were revealed. During repeated operations (on the 19<sup>th</sup>, 37<sup>th</sup>, 59<sup>th</sup> day from the onset of the disease), gradual pancreatic necrosectomies with a wide drainage of the retroperitoneal space were performed.

On the 65<sup>th</sup> day, the patient developed bleeding from the drainage, located in the left retroperitoneal space with a blood loss of up to 50 ml, which stopped on its own. The conducted hemostatic therapy had a temporary effect and after two days from the first bleeding there was a recurrence of hemorrhage in a volume of 500 ml with the collapse presentation. The bleeding stopped on its own due to a drop in blood pressure to 80/20 mmHg. After another three days, repeated profuse arterial bleeding developed in a volume of 1 liter.

Laparotomy, pancreatic necrosectomy, stop of the arrosive bleeding by tamponade, drainage of the abdominal cavity and retroperitoneal space were performed. Intra-operatively, due to severe infiltration and unclear topography of anatomical structures caused by purulent destructive process, adequate revision was impossible; the source of bleeding was not localized. Intensive hemostatic therapy was carried out, including blood transfusions of erythrocytes and plasma, transfusion of cryoprecipitate. After another 9 days, there were 2 repeated bleeding episodes in a volume of 700 ml and 1000 ml, respectively.

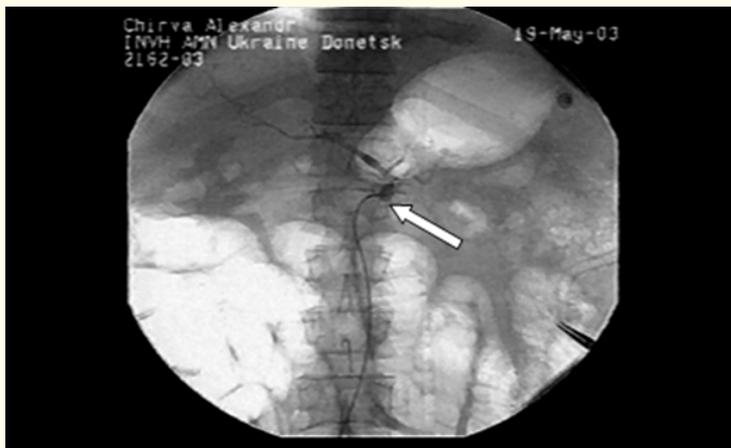
Because of the severity of the patient's condition, associated with the manifestations of the syndrome of endogenous intoxication and several bleeding episodes with surgical intervention, it was decided to perform angiography to determine the source of bleeding and carry out hemostatic measures. In the endovascular surgery department after catheterization of the right femoral artery with Seldinger technique, a catheter was inserted into the celiac trunk and a celiacography was performed. After the insertion of the contrast agent, the branches of the celiac trunk and splenic artery were visualized.

Figure 1 shows the angiogram, which was performed at the peak of bleeding from the splenic artery. On the angiogram, extravasation of the contrast agent beyond the vessel was visible.



**Figure 1:** Celiacography in a patient with an arrosive bleeding. The arrow indicates extravasation of contrast beyond the splenic artery.

After the angiography the source of bleeding was revealed - the splenic artery. In order to stop bleeding the contour embolus was used. After the splenic artery embolization, the bleeding was stopped. There was no contrast beyond the vessel and the splenic artery was not contrasted (Figure 2).



**Figure 2:** Celiacography after embolization of the splenic artery. The arrow indicates the location of the contour emboli.

The proposed method of erosive bleeding control was applied in 5 patients with pancreatic necrosis. Procedures were performed under neuroleptanalgesia. All patients received good immediate results - complete and stable hemostasis was achieved in all patients after embolization. No complications and rebleeding were observed after embolization procedure, unlike surgical interventions.

### Conclusion

Spontaneous bleeding is a serious complication of the pancreatic necrosis which often leads to unfavorable results. The use of an angiographic method of bleeding control allowed to localize the source of bleeding efficiently and less traumatically, that ultimately leads to a mortality reduction in these patients. Endovascular technique has benefits over surgical treatment. It is less invasive and gives possibility to reveal an exact source of bleeding.

The use of minimally invasive angiographic techniques for control bleeding from the vessels supplying the pancreas allowed:

1. To minimize the operation trauma in the already weakened patients with pancreatic necrosis;
2. To carry out highly effective measures to stop bleeding without using anesthesia;
3. Quickly and effectively stop bleeding with visualization of the completeness of vessel obstruction and the reliability of hemostasis.

This endovascular technique should be performed according to strict indications at an earlier time from the onset of hemorrhage, when it is not possible to stop bleeding by conservative methods. Even with the first episode of massive bleeding, angiography should be performed and, depending on the location and size of the damaged vessels, we have to perform appropriate intervention. The greatest diagnostic value has the study performed at the peak of the bleeding.

## Bibliography

1. Howard TJ., *et al.* "Declining morbidity and mortality rates in the surgical management of pancreatic necrosis". *Journal of Gastrointestinal Surgery* 11.1 (2007): 43-49.
2. Rodriguez JR., *et al.* "Debridement and closed packing for sterile or infected necrotizing pancreatitis: insights into indications and outcomes in 167 patients". *Annals of Surgery* 247.2 (2008): 294-299.
3. Besselink MGH., *et al.* "Timing of surgical intervention in necrotizing pancreatitis". *Annals of Surgery* 142.12 (2007): 1194-1201.
4. Navaneethan U., *et al.* "Minimally invasive techniques in pancreatic necrosis". *Pancreas* 38.8 (2009): 867-875.
5. van Santvoort HC., *et al.* "A step-up approach or open necrosectomy for necrotizing pancreatitis". *New England Journal of Medicine* 362.16 (2010): 1491-1502.
6. Jino Kim., *et al.* "Endovascular intervention for management of pancreatitis-related bleeding: a retrospective analysis of thirty-seven patients at a single institution". *Diagnostic and Interventional Radiology* 21.2 (2015): 140-147.
7. Alexandre de Tarso., *et al.* "Endovascular treatment of hemorrhage due to splenic artery injury in acute pancreatitis: case report". *Jornal Vascular Brasileiro* 9.1 (2010).
8. Harpreet Hyare., *et al.* "Endovascular Management of Major Arterial Hemorrhage as a Complication of Inflammatory Pancreatic Disease". *Journal of Vascular and Interventional Radiology* 18.5 (2007): 591-596.

**Volume 5 Issue 11 November 2018**

©All rights reserved by Archili Miminoshvili., *et al.*