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Инкапсулированный некротический панкреатит

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АННОТАЦИЯ

Некротический панкреатит, или панкреонекроз, — наиболее тяжёлая форма острого панкреатита с высокой частотой летальных исходов. Период, наиболее подходящий для диагностики острого панкреатита, составляет 3–5 дней от манифестации симптомов болезни. В этот период отёк и преходящая ишемия поджелудочной железы могут маскироваться под некроз и разрешаться при последующих исследованиях, и наоборот, местные осложнения могут развиваться без клинических корреляций.

В настоящее время при ведении острого панкреатита все большее значение отводится методам лучевой диагностики, в частности компьютерной томографии, за счёт возможности более точной волюметрии поджелудочной железы, оценки состояния и измерения диаметра селезёночной вены, что в перспективе может иметь значение при формировании прогноза течения панкреонекроза.

В статье приведён редкий клинический случай осложнения острого панкреатита — инкапсулированного некротического панкреатита, возникшего на фоне алиментарных нарушений. Приведены аспекты семиотики лучевых методов диагностики при динамическом обследовании данных патологий. Случай примечателен тем, что манифестация заболевания у пациента при поступлении в стационар была сопоставима с классической отёчной формой острого панкреатита. Дальнейшее нарастание отрицательной динамики было отмечено серией компьютерно-томографических изображений в динамике, выполненных между клинико-морфологическими фазами течения острого панкреатита и до формирования панкреонекроза, осложнённого секвестрацией тела поджелудочной железы с парапанкреатическим абсцедированием, что позволило максимально наглядно показать ступенчатое развитие заболевания. Лечебная парадигма была изменена, и место консервативного подхода заняла активная хирургическая тактика с последующими неоднократными манипуляциями и динамическим компьютерно-томографическим и магнитно-резонансным контролем вплоть до улучшения состояния пациента.

На сегодняшний день методы лучевой диагностики в совокупности с адекватным терапевтическим и хирургическим подходами способны улучшить прогноз течения некротического панкреатита.

Ключевые слова: мультиспиральная компьютерная томография; МСКТ; магнитно-резонансная томография; МРТ; компьютерная томография; КТ; некротический панкреатит; панкреатит; поджелудочная железа; панкреонекроз; клинический случай.

Как цитировать

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Encapsulated necrotic pancreatitis

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ABSTRACT

This study presents a rare clinical case of encapsulated necrotic pancreatitis, which was a complication of acute pancreatitis that arose against the background of alimentary disorders. The aspects of the semiotics of radiation diagnostic methods in the follow-up control of these pathologies were presented.

This case is notable for the manifestation of diseases upon hospital admission, as in the classical edematous form of acute pancreatitis, with a further increase in negative dynamics. This demonstrated the possible stepwise disease development, accompanied by a series of follow-up computed tomography between the clinical and morphological phases of acute pancreatitis and before the formation of pancreatic necrosis, which was complicated by sequestration of the pancreatic body with peripancreatic abscess formation. Afterward, the therapeutic paradigm was changed, and the place of the conservative approach was taken by active surgical tactics, followed by repeated manipulations and follow-up computed tomography and magnetic resonance until the improvement of the patient's condition.

Keywords: multispiral computed tomography; MDCT; magnetic resonance imaging; MRI; computed tomography; CT; necrotic pancreatitis; pancreatitis; pancreas; pancreatic necrosis; case report.

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包裹性坏死性胰腺炎

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简评

坏死性胰腺炎或胰腺坏死是急性胰腺炎中最严重的一种，死亡率很高。最适合诊断急性胰腺炎的时期是从疾病症状开始的3–5天。在此期间，胰腺水肿和暂时性缺血可能伪装为坏死，并在后续研究中消失，反之亦然，局部并发症可能在没有临床相关性的情况下发生。

目前，在急性胰腺炎的治疗中，放射诊断方法越来越受到重视，尤其是计算机断层扫描，因为它可以更精确地测量胰腺容积、评估病情和测量脾静脉直径，这在未来可能对胰腺坏死过程的预后形成有重要影响。

这篇文章介绍了一个罕见的急性胰腺炎并发症的临床病例包裹性坏死性胰腺炎，它是在消化系统疾病的背景下出现的。本文介绍了放射诊断方法在这些病理学动态检查中的符号学方面。该病例值得注意的是，患者入院时的疾病表现与典型水肿型急性胰腺炎相当。在急性胰腺炎病程的临床和形态学阶段之间以及在胰腺坏死形成之前进行的一系列动态CT图像显示负动态进一步增加，并伴有胰腺体分离和胰旁脓肿形成，这使得最清楚地显示疾病的逐步发展成为可能。治疗模式发生了改变，保守治疗被积极的手术策略所取代，随后是反复操作、动态计算机断层扫描和磁共振控制，直到患者病情好转。

迄今为止，放射诊断方法结合适当的治疗和手术方法可以改善坏死性胰腺炎的预后。

关键词： 多层计算机断层扫描；MSCT；磁共振成像；核磁共振；CT扫描；电脑断层扫描；坏死性胰腺炎；胰腺炎；胰腺；胰腺坏死；临床病例。

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INTRODUCTION

The most severe form of acute pancreatitis is necrotic pancreatitis, which has a mortality rate ranging from 30% to 100% [1–4]. Necrotic pancreatitis, also known as pancreatic necrosis, occurs in 15%–20% of cases of acute pancreatitis [5]. The global incidence of acute pancreatitis ranges from 4.9 to 73.4 cases per 100,000 populations, with 10%–13% of patients with abdominal surgical pathology in Russia [6].

The key importance of radiodiagnostic methods for detecting the disease and selecting the approach to managing patients with pancreatic necrosis has been described by major Russian scientists [7], as well as a number of international authors [8–11].

Currently, the role of radiation diagnostic methods in the management of acute pancreatitis, in particular computed tomography (CT), is expanding due to the possibility of more accurate volumetry of the pancreas [12], assessment of the condition, and measurement of the diameter of the splenic vein, which may be important in the formation of the prognosis of pancreatic necrosis course [13]. The first studies are being conducted to investigate the relationship between the loss of skeletal muscle density according to CT data and the deterioration of the prognosis of the course of necrotic pancreatitis [14].

The updated Atlanta guidelines on the course and management of acute pancreatitis (USA, 2012)[1] include trends to reduce radiation exposure to the patient and reduce the economic burden by refusing excessive imaging (CT and MRI) with a primary reliance on clinical examination data, ultrasound (US), and biochemical markers of inflammation; exceptions include an unclear diagnosis or aggravation of the condition in acute pancreatitis during the first 48–72 hours [15, 16]. However, other sources indicate that more than half of patients with acute pancreatitis who are clinically suitable for curation without objective imaging methods do so on their own [17]. When using updated diagnostic criteria to make clinical decisions, physicians experience additional stress [18]. Over time, the Atlanta classification for acute pancreatitis has been revised and is now widely used in Europe [19].

CASE DESCRIPTION

On January 13, 2018, patient Kh., 40, was admitted to the intensive care unit in a critical condition with a clinical presentation of acute pancreatitis and multiple organ failure, as well as complaints of severe girdle pain in the upper abdomen, nausea, and vomiting upon admission.

Case history. The patient experienced an acute onset of the disease within a day of eating a large amount of fatty foods (hypersecretory mechanism of development); in the morning, he experienced stabbing pains in the upper abdomen, followed by nausea, vomiting, and pain radiation to the lumbar region. He was taken by an ambulance to the admission department of the National Medical Research Treatment and Rehabilitation Center of the Ministry of Health of Russia (Moscow).

Results of physical, laboratory, and instrumental examination

At the time of admission, the patient's condition was classified as early phase IA.

A multispiral CT on January 14, 2018, revealed acute pancreatitis with no signs of destruction of the pancreatic parenchyma (Fig. 1).

Within 2 days in the intensive care unit, the patient underwent infusion-corrective, antisecretory, antioxidant, hepatoprotective, and antispasmodic therapy; multimodal anesthesia was administered, as well as prevention of thromboembolic complications and decompression of the gastrointestinal tract.

On January 15, 2018, the patient with subjective improvement was transferred to the department. When a fever of up to 38°C appeared, antibiotics were added to the treatment. A dense painless infiltrate 12 × 10 cm in size was palpated in the paraumbilical region on the left by the clinician. Clinically, the situation was regarded as a manifestation of acute pancreatitis phase IB (the phase of formation of peripancreatic infiltrate and resorptive fever).

By January 22, 2018, after the patient's condition had stabilized, his body temperature had returned to normal and data from laboratory and instrumental studies had been collected, there was an increase in signs of local inflammatory changes in the retroperitoneal space. The US results showed an increase in the volume of fluid in the abdominal cavity as well as imbibition of fatty tissue in the left half of the retroperitoneal space (pancreatic necrosis).

The study was supplemented with CT scans of the thoracic organs (TO CT) and the abdominal organs (AO CT), which revealed bilateral pleural effusion, with more on the left; consolidation in the lower lobe of the left lung; atelectasis in the basal sections of both lungs; and destructive pancreatitis with the pancreatic parenchyma contrasted fragmentarily, its head increased over time, increased fluid accumulations and the appearance of heaviness in the abdominal cavity and retroperitoneal space (Fig. 2). The changes allowed for an evaluation of the clinical and instrumental presentation at the phase IB end and the phase II beginning of the disease (aseptic sequestration).

Given the absence of signs of pancreatic tissue infection in the patient and clinical improvement, it was decided to forego surgical intervention. By January 24, 2018, the general blood test showed a decrease in leukocytosis (from 21.8 to 16.9 × 10^9 g/l) and C-reactive protein (from 206 to 144 ml/l) concentrations. However, after a period of clinical

[1] Atlanta classification of acute pancreatitis. Access mode: https://medach.pro/post/1830. Reference date: 10/15/2021

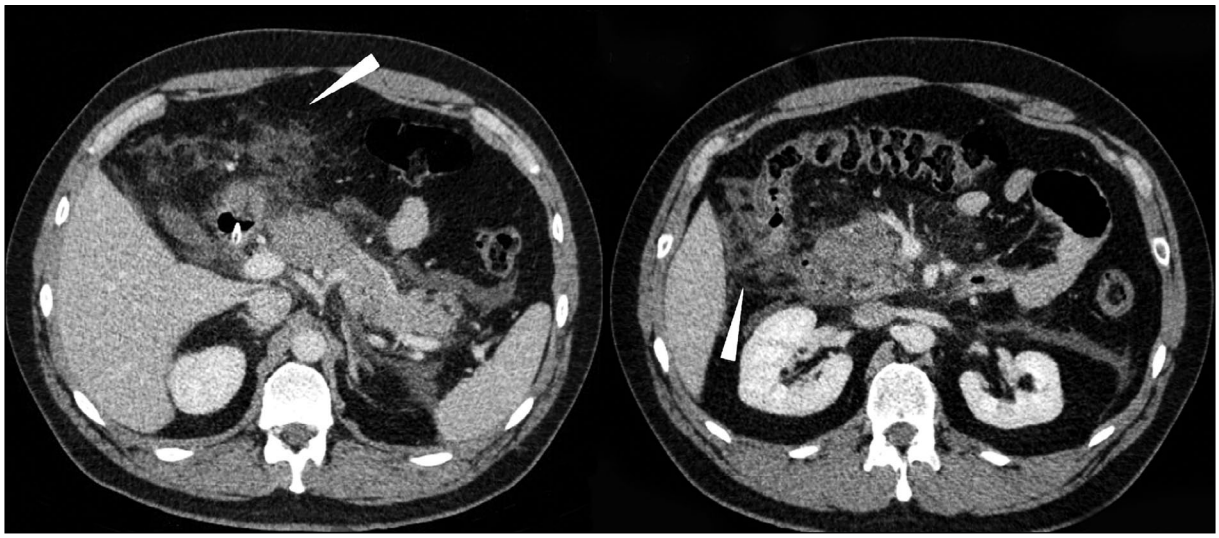

Fig. 1. Computed tomography of the abdominal organs with intravenous contrasting: infiltration of peripancreatic adipose tissue and adipose tissue in the subhepatic space (arrows)

improvement, on day 18 of admission (January 31, 2018), the patient's condition deteriorated sharply, with the appearance of pain, hyperthermia up to 38°C with chills, equivocal peritoneal symptoms, and an increase in leukocytosis up to 31×10^9 g/l in the general blood test.

The control ultrasound of the abdominal cavity detected sequestration of the gland body and the accumulation of a large amount of fluid around it; fenestration of the omental sac with the abdominal cavity, where an undelimited liquid with fibrin inclusions (at least 1 liter in volume) is also found in all departments; and pronounced imbibition of the retroperitoneal fatty tissue of the paracolar zones. Thus, the ultrasound presentation corresponded to the progression of necrobiotic changes in the pancreas due to pancreatic necrosis, i.e., and the formation of a parapancreatic abscess.

On January 31, 2018, after a brief preoperative period, diagnostic laparoscopy, sanitation, and drainage of the abdominal cavity were performed urgently, followed by conversion to laparotomy with the formation of an omentobursostomy in order to facilitate access to the omental sac for necrosequestrectomy.

The intraoperative diagnosis was severe acute pancreatitis, pancreatic necrosis with retroperitoneal fluid accumulations, phase of septic sequestration, and widespread pancreatogenic serous-fibrinous (enzymatic) peritonitis.

On February 1, 2018, an ultrasound of the abdominal cavity revealed a fluid accumulation of 7 × 4.5 × 15 cm in the right half of the retroperitoneal space, closely adjacent to the posterior wall of the ascending colon. Due to the high risk of damage to the colon during open drainage, US-controlled

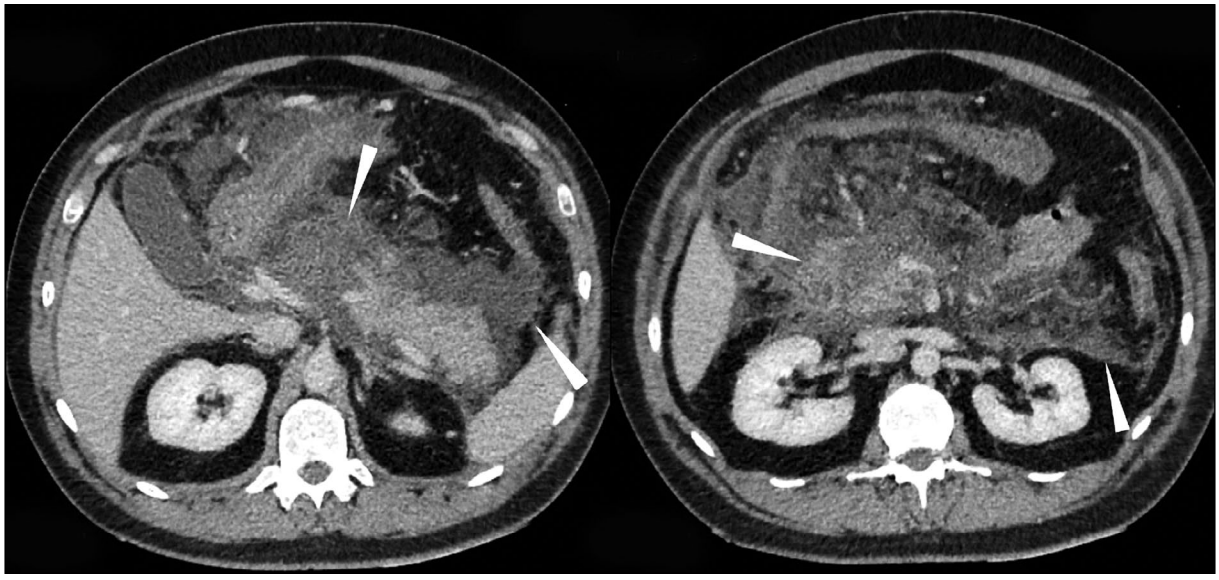

Fig. 2. Computed tomography of the abdominal organs with intravenous contrasting: infiltration and fluid accumulations in the peripancreatic fatty tissue, along the perirenal fascia on the left, in the parenchyma of the pancreatic head and body (arrows)

drainage was used to prevent erosion of the intestinal wall and infection of the retroperitoneal space.

In the postoperative period, following the occurrence of cardiovascular and respiratory failure, the patient was extubated on day 2 (February 2, 2018). The comprehensive therapy had a positive effect, with a decrease in leukocytosis to 10×10^9 g/l in the general blood test in presence of a persistently high C-reactive protein level (241 mg/l). Then, during the week, the patient had daily dressings with revision and sanitation of the omentobursostomy. During the revision of the omentobursostomy, no additional leaks or free-lying sequesters were found.

At the control AO CT scan (02/01; 02/02; 02/05/2018), the CT presentation showed no deterioration; the state of the pancreas and fluid accumulation along the gland contour in the area of the omental sac had changed; non-draining fluid accumulations in the retroperitoneal space were not detected (Fig. 3).

After the condition stabilization, on tenth day after the surgery, the patient was transferred to the surgical department. After numerous necrosequestrectomy for 9 days, flow aspiration drainage of the omental sac cavity was established.

The control TO and AO CT (February 14; February 21, 2018) revealed a decrease in the left-sided hydrothorax and resolution of the area of consolidation in the lower lobe of the left lung, as well as a decrease in effusion in the peripancreatic tissue and infiltrative changes in the fatty tissue of the abdominal cavity (Fig. 4).

Clinically, the formation of an external pancreatic fistula was noted. On February 28, 2018, the patient underwent MR cholangiography, which revealed that the Wirsung's duct at the level of the head and body of the pancreas was not visualized; that it had a tortuous course in the tail, with uneven contours and a diameter of 2 mm; and that no fistulous tracts were detected. Intra- and extrahepatic bile ducts were not dilated (Fig. 5).

Over the next month, conservative therapy and flow aspiration drainage of the omental sac were performed. The patient's condition improved to the point of being satisfactory, the fever subsided, and an external pancreatic fistula was formed. In the outpatient setting, the patient was discharged under the supervision of a surgeon.

The control AO CT on March 23, 2018, detected a decrease in the size of the infiltrate anterior to the body and tail of the pancreas, as well as a decrease in the infiltrate along the ascending colon; the gland was reduced in size, with the sagittal size of 17 mm at the level of the tail and 6 mm at the level of the body, and it was not significantly differentiated at the level of the gland head (Fig. 6).

Thus, timely diagnostics enabled the most appropriate treatment approach to be chosen in the demonstrated clinical case, which improved the prognosis of the disease, with the acute and subacute periods ending relatively well.

DISCUSSION

L. Sorrentino et al. [20] used a minimally invasive approach in the treatment of severe pancreatic necrosis, namely endoscopic transgastric necrosectomy. At the first stage, our treatment approaches are similar, namely, diagnostic laparoscopy and drainage of the abdominal cavity; however, at the second stage, we preferred to expand the surgical intervention with conversion to laparotomy and formation of an omentobursostomy to facilitate access to the omental sac for necrosequestrectomy.

A group of Japanese scientists describes successful treatment of a patient with necrotic pancreatitis using a combination of continuous drainage of the skin wound by negative pressure and endoscopic necrectomy [21]. Another

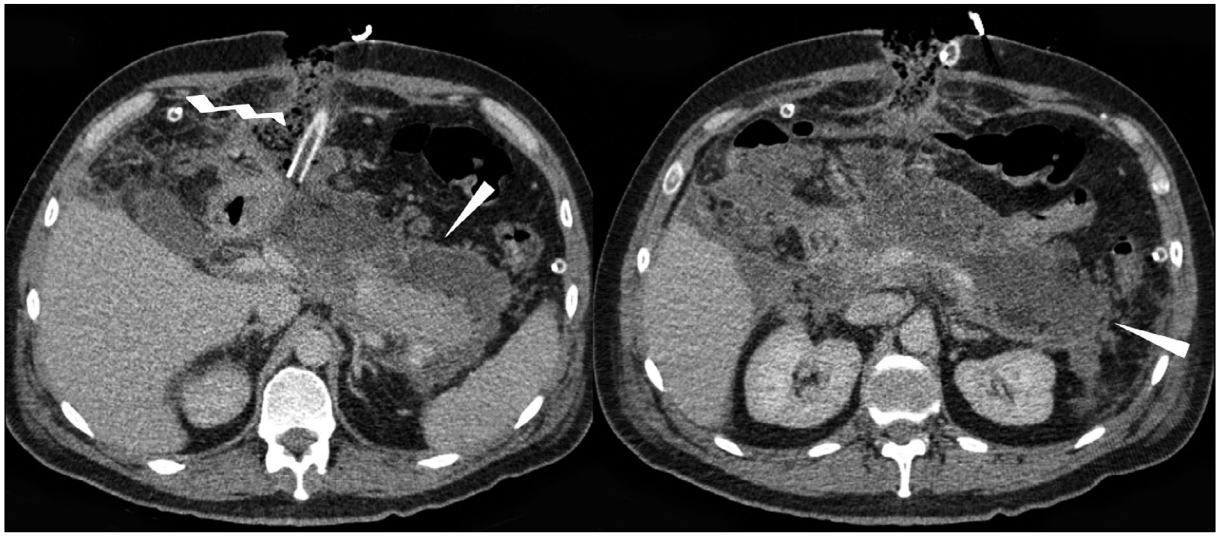

Fig. 3. Computed tomography of the abdominal organs with intravenous contrasting: infiltration and fluid accumulations in the peripancreatic fatty tissue, along the perirenal fascia on the left, in the parenchyma of the pancreatic head and body (arrows); drain tube (zigzag arrow in the image on the left). The formation of a thin contrasting capsule along the infiltration zone over time is noted

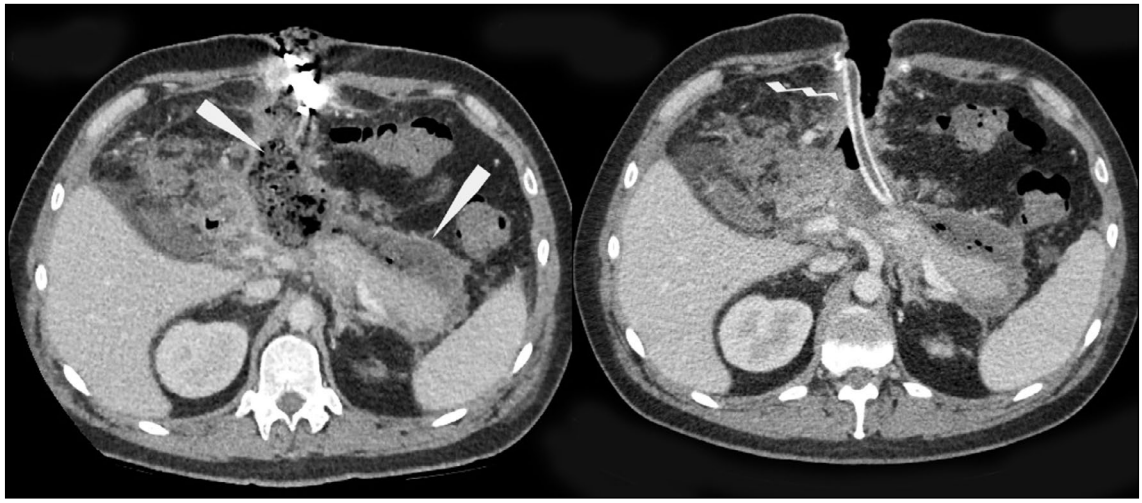

Fig. 4. Computed tomography of the abdominal organs with intravenous contrasting: encapsulated infiltration and fluid accumulation in the peripancreatic adipose tissue, which decreased over time (image on the left, arrows), a hemostatic sponge in the cavity of the encapsulated contents; drain tube (image on the right, zigzag arrow). Further formation of a thin contrasting capsule along the course of the infiltration zone over time is noted

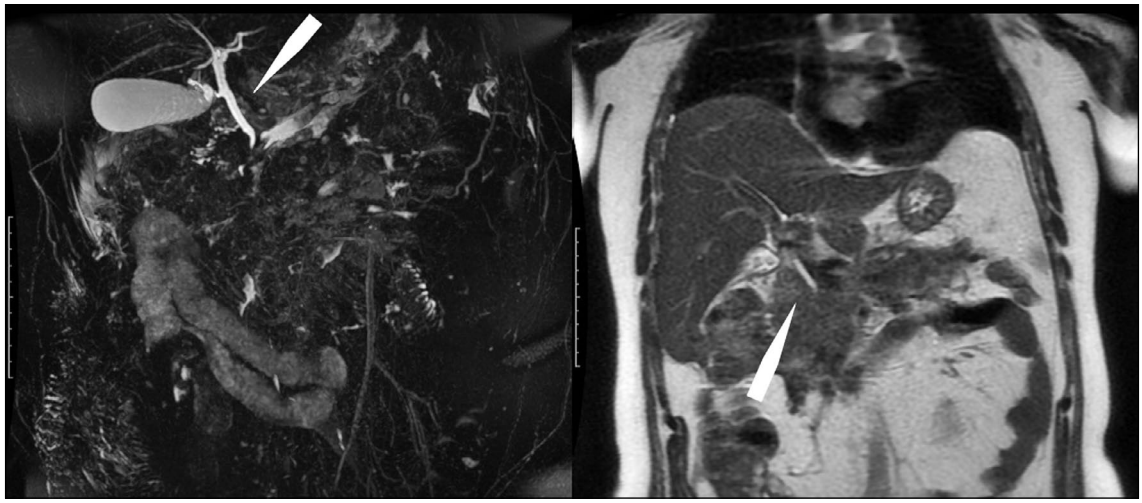

Fig. 5. Magnetic resonance imaging cholangiography (left) and T2-WI (coronal plane, right). The distal part of the common bile duct is "hidden" in the infiltrate; the proximal part of the common bile duct and the intrahepatic bile ducts are not dilated (arrows)

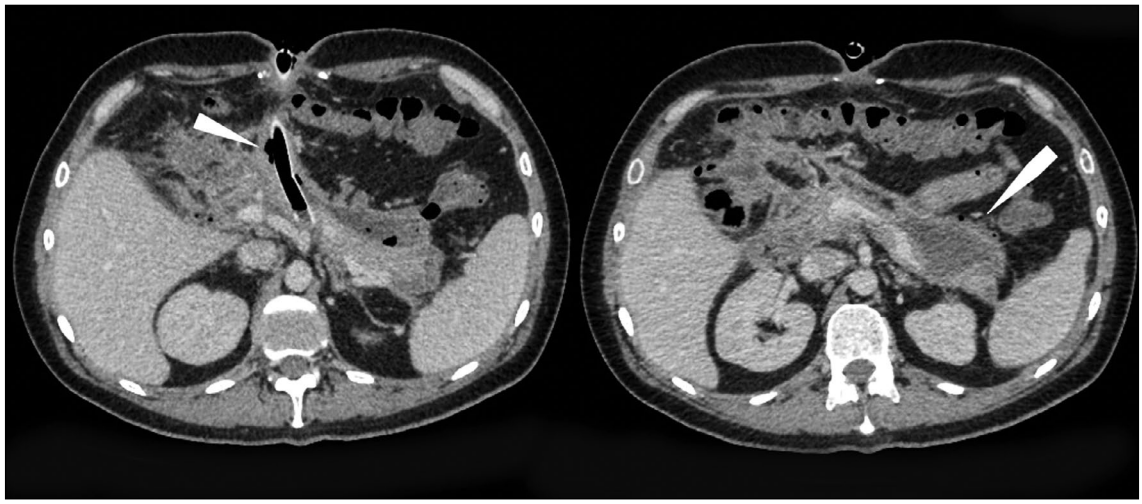

Fig. 6. Computed tomography of the abdominal organs with intravenous contrasting: drainage tube (left image, arrow); encapsulated infiltration and fluid accumulation in the peripancreatic fatty tissue, which decreased over time (image on the right, arrow)

clinical case [22] demonstrated the development of necrotic pancreatitis following an ampullary biopsy in Barrett's esophagus, with subsequent treatment involving repeated drainage of the necrotic cavity under CT guidance.

In all the clinical cases presented, including ours, in addition to clinical and laboratory data, CT with intravenous contrasting was actively used for diagnostics, assessment of the course of the disease, and choice of treatment approach.

Thus, the best time to diagnose acute pancreatitis is 72 hours to 5 days after the onset of disease symptoms. During this period, edema and transient ischemia of the pancreas can be misdiagnosed as necrosis and resolved in subsequent studies, and local complications may develop without clinical correlations. In the patient, in the case presented, during the period of a stable severe clinical presentation, the transition of phase IA to phase IB of the disease development was recorded.

Clinical guidelines recommend using CT to rule out local complications when the clinical presentation changes and/or the patient's condition deteriorate sharply. In the case presented, the patient's CT was sensitive to changes in the clinical presentation and recorded a transition at the beginning to phase IIA of aseptic sequestration, followed by phase IIB of septic sequestration with the formation of a parapancreatic abscess.

CT is a necessary study when planning minimally invasive surgical interventions, which are currently preferred in the treatment of necrotic pancreatitis. This approach was used on our patient.

In pancreatic necrosis, MRI is the method of choice for assessing the condition of the common bile duct and the Wirsung's duct, which was very important for our patient who developed an external pancreatic fistula during the treatment of necrotic pancreatitis.

CONCLUSION

To date, methods of radiation diagnostics combined with adequate therapeutic and surgical approaches can improve the prognosis of the course of necrotic pancreatitis.

ADDITIONAL INFORMATION

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Authors' contribution. S.I. Kitavina — preparation and writing of the text of the article; V.S. Petrovichev — text writing and article editing; A.N. Ermakov — literature review, collection and analysis of literary sources review of literature, edition illustrative material of the article; N.A. Ermakov — writing of the text of the article, preparation illustrative material of the article; I.G. Nikitin — article editing. All authors made a substantial contribution to the conception of the work, acquisition, analysis, interpretation of data for the work, drafting and revising the work, final approval of the version to be published and agree to be accountable for all aspects of the work.

Consent for publication. Written consent was obtained from the patient for publication of relevant medical information and all of accompanying images within the manuscript.

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