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# TWO-STAGE SURGICAL TREATMENT TACTICS IN MECHANICAL ICTERUS OF NEOPLASTIC GENESIS WITH APPLICATION OF ANTEGRADE PERCUTANEOUS BILIARY DRAINAGE

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The aim of the study was to analyze the results of two-stage surgical tactics for mechanical icterus of neoplastic genesis using antegrade percutaneous biliary drainage. Material and methods. The study is based on a retrospective analysis of the results complex treatment of 52 patients with mechanical icterus of neoplastic genesis who were treated in surgical departments of the Republican Hospital №2 - Center for Emergency Medical Care from 2015 to 2019. The diagnosis of malignant neoplasm complicated by mechanical icterus was verified on the basis of a complex clinical examination. The structure of the variants of diseases that caused the development of mechanical icterus was as follows: cancer of the liver and intrahepatic bile ducts – 4 (7,8%), cancer of the gallbladder and extrahepatic bile ducts – 2 (3,8%), cancer of the large duodenal papilla – 1 (1,9%), pancreatic cancer – 43 (82,7%), stomach cancer – 2 (3,8%). At the first stage of treatment, with the goal of biliary decompression, percutaneous cholecystostomy was performed in 3 (5,8%) patients and percutaneous transhepatic cholangiostomy in 49 (94,2%) patients. At the second stage, in order to finally restore the passage of bile (which were objectively possible in a particular clinical situation), the following surgical interventions performed: hepaticoejunostomy – 1 (1,9%) patients, cholecystoenterostomy – 3 (5,8%), external drainage of the bile ducts – 2 (3,8%) and pyloroduodenal resection – 7 (13,5%) patients. Results. The use of antegrade percutaneous drainage for the purpose of biliary decompression with the proper technical level and adequate preoperative preparation is accompanied by a relatively low percentage of complications and mortality. Conclusion. The clinical experience we have presented of using two-stage surgical treatment tactics for mechanical icterus of neoplastic genesis allows us to recommend its widespread use in the practice of urgent surgical clinics.

**Keywords:** mechanical icterus, antegrade percutaneous biliary drainage, two-stage therapeutic tactics.

**Introduction.** The problems of diagnosis and treatment of mechanical icterus (MI) syndrome of neoplastic genesis remain to date difficult to solve problems of modern surgery [3]. Based on literature data [6,7,9], as well as official statistics [4], over the past decade, there has been a gradual increase in the number of diseases, especially malignant neoplasms (MN), in which MI develops, which cannot but alarm and do not address some issues of the provision of surgical care for this category of patients.

It has been established that the most common cause of neoplastic obstruction of the bile ducts is: cancer of the liver and intrahepatic bile ducts, cancer of the gallbladder and extrahepatic ducts, cancer of the stomach and pancreas [8]. At present, in the Russian Federation (RF), the proportion of cancer incidence of these localizations is 10,98%. The specific gravity of gastric cancer is 5,91%, liver, intrahepatic bile ducts – 1,41%, gallbladder and extrahepatic bile ducts – 0,59%, pancreas – 3,07% [4]. For comparison, as well as the actualization of the study, we present the estimated incidence rates of MN of the pancreatoduodenal zone per 100,000 populations in the RF and the Republic of Sakha (Yakutia) (RS (Y)). In the RF with gastric cancer, this indicator is 13,5, in RS (Y) – 16,4, cancer of the liver and intrahepatic ducts in the RF – 3,3, RS (Y) – 15,3, cancer of the gallbladder and extrahepatic bile ducts in the RF – 1,2, RS (Y) – 1,4, pancreatic cancer in the RF – 7.0, RS (Y) – 7,4 [4]. The above figures cause genuine concern, and create the need to search for new, as well as improving the existing principles and methods of surgical treatment of this category of patients at all stages of medical care, taking into account regional characteristics.

With a low percentage of resectability of tumors of the pancreatoduodenal zone, which according to some reports is not more than 20% [3, 5], and also taking into account the high postoperative mortality and a large number of complications of surgical operations at the height of icterus in MN, it has been used for many years throughout the world the so-called staged treatment [14]. According to [13,15], in this case, biliary drainage (BD) allows you to interrupt the cascade of developing pathological processes, and above all, the development of liver failure, and the final restoration of the passage of bile is performed after its relief. This tactic is also justified by the fact that it is not uncommon for minimally invasive surgical interventions in patients with MN to become the final treatment option [9]. However, there are also opponents of the use of two-stage therapeutic tactics in patients with MN complicated by MI, who argue that due to the widespread use of modern and technological methods of hardware imaging, more advanced methods of radical surgical treatment and pharmacotherapy, good treatment results can be achieved in a short time [3].

For this reason, the aim of our study was to analyze the results of two-stage surgical tactics for mechanical icterus of neoplastic genesis using antegrade percutaneous biliary drainage.

**Material and methods.** The presented work is based on a retrospective analysis of the results of complex treatment of 52 patients with mechanical icterus of neoplastic genesis who were treated in emergency surgical departments of the Republican Hospital №2 - Center for Emergency Medicine (RHN№2-CEM) of the Republic of Sakha (Yakutia) in the period from 2015 to 2019 years. The

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average age of patients was 67,6 ± 6,5 years, with 17 men (32,7%) and 35 women (67,3%). The diagnosis of MN disease complicated by MI was verified on the basis of a comprehensive examination. The structure of the nosological forms of diseases that caused the development of the breast was as follows: cancer of the liver and intrahepatic bile ducts – 4 (7,8%), cancer of the gallbladder and extrahepatic bile ducts – 2 (3,8%), cancer of the large duodenal papilla (LDP ) – 1 (1,9%), pancreatic cancer – 43 (82,7%), stomach cancer – 2 (3,8%). Moreover, stage II disease was detected in 2 (3,8%) patients, stage III – in 23 (44,3%) and stage IV – in 27 (51,9%) patients. We considered the main laboratory criteria for the development of MI: an increase in the level of total bilirubin to more than 21,5 μmol / l, direct, more than 5 μmol / l. Instrumental – expansion of extrahepatic bile ducts > 8 mm, and intrahepatic bile ducts > 4 mm. To determine the severity of the MI and the risk of upcoming surgery, the classification of E.I. Halperin et al. [2]. Ultrasound investigation was performed on an HDI 5000 echo sounder from «Philips» and Elegra from «Siemens» in gray scale, tissue harmonic, color and energy doppler imaging according to standard methods. The study upon admission to the clinic was carried out without prior preparation. Endoscopic examination was performed using a GIF Type 2 T 160 gastrofibroscope «Olympus» (Japan). Retrograde cholangiopancreatography (RCHP) was performed according to the standard method using an «Olympus» TJF type 160 R duodenovideoscope with an EVIS EXERA video system and a set of endovideotherapeutic tools. X-ray surgical interventions were carried out on a universal x-ray machine POLYSTAR T.O.P. company «Siemens». Computed tomography was performed on a 64-slice computer tomography Somatom Definition AS, Siemens Medical Solutions using the AbdomenMultiPhase program with a layer thickness of 5 mm in two stages, before and after bolus contrast enhancement (Ultravist 370 mg / iodine per 100 ml with an injection rate of 3,0 ml / s). In some cases, as a rule, for the purpose of differential diagnosis, radiation studies were supplemented by magnetic resonance imaging (MRI).

In order to decompress the biliary system at the first stage, the following types of surgical interventions were performed: percutaneous cholecystostomy (PC) – 3 (5,8%), percutaneous transhepatic cholangiostomy (PTC) – 49 (94,2%). PC and PTC were performed under the control of ultrasound with subsequent control cholangiography. For the final restoration of the passage of bile in the second stage (if it was possible or appropriate), the following surgical interventions were performed: hepatikoejunostomy – 1 (1,9%), cholecystoenterostomy – 3 (5,8%), external drainage of the bile ducts – 2 ( 3,8%), pyloroduodenal resection (PDR) – 7 (13,5%).

Statistical processing of the material was carried out using the statistical software package IBM.SPSS.Statistiks.v22. When evaluating the entire population, mean values (M) and standard deviation (m) were calculated.

**Results and discussions.** We are forced to admit that when choosing a method for eliminating MI during MN, the criteria of resectability were not always taken into account. This was largely due to the urgent profile of the clinic in question. At the same time, palliative interventions in the volume of PC and PTC were performed in all 52 (100%) patients with MI due to MN. Among them, in 39 (75,0%), the chosen method of decompression of the biliary system turned out to be the final treatment option, and 13 (25,0%) patients were subsequently subjected to repeated (second stage) surgical interventions in the amount of hepatikoejunostomy, cholecystoenterostomy, pyloroduodenal resection and external drainage of extrahepatic bile ducts.

Complications after performing PC and PTC were revealed in 9 (17,3%) patients. In this case, directly related to the technical aspects of the operation (intraoperative) – in 6 (11,5%). In three cases, bile leakage was recorded in the postoperative period, which amounted to 5,8%. In two cases, bleeding from the liver parenchyma at the place of passage of the transhepatic drainage was diagnosed – 3,8%, and in one case there was damage to the vessels of the round ligament of the liver, also accompanied by intraperitoneal bleeding – 1,9%. In all cases, laparotomy was required with hemostasis and / or abdominal sanitation. At the same time, two died – 33,3% of patients. Three patients – 5,8%, noted complications not associated with surgery, which arose against the background of disorders in the hemostatic system, and against the background of the underlying disease – acute ulcers of the stomach and duodenum with bleeding. All patients underwent endoscopic hemostasis, with no subsequent recurrence of bleeding.

According to a number of authors [1,9,10,13], whose statements are difficult to disagree with, the main factor in reducing the number of complications and fatalities in performing PC and PTC are the technical aspects of the implementation and the materials used for this. We considered the «two-step» methodology to be the most acceptable and safe [10]. When installing the drains, a Cook kit (USA) was used, consisting of a drain (Ultrathane® material) with an AQ® hydrophilic coating and a pigtail end (diameter from 8,5 Fr) with a MAK-LOC lock and Intro-TipTM fixation ligature, 18G trocar needle, stainless steel conductor, StatLock catheter cutaneous catheter, and «Rusch» kit (Germany). Prevention of possible complications during the performance of PC and PTC was also always inextricably linked with the correction of endotoxemia, liver failure and hemostatic disorders. We considered acceptable blood biochemical values for performing transcutaneous interventions: INR no more than 2 units, APTT no more than 50 sec., fibrinogen no more than 5 g / l, the rest of the patients need intensive preoperative preparation for 5-7 days in order to correct violations homeostasis. In the first 24 hours from the moment of admission, all patients with initial hyperbilirubinemia underwent gravitational therapeutic plasmapheresis, and then they performed PC or PTC. In some cases, 3-4 plasmapheresis sessions were required at intervals of 48-72 hours. Plasmapheresis was also carried out by those patients who subsequently planned a radical operation. This approach allowed normalizing the index of homeostasis 2-3 times faster than with conventional therapy.

Radical surgical interventions were performed by us in two stages, and only with preliminary unloading of the biliary system (PC or PTC), which indicates the presence of a differentiated approach to staging in MN of complicated MI. However, the attitude to the problem of the choice of medical tactics in such cases in the world literature remains controversial, so V.P. Kharchenko [8] reports a two-stage tactic in all patients with breast cancer of neoplastic origin, considering BD a necessary component of complex treatment, while the study by A. Niels [14], on the contrary, it proves inexpediency at the first stage to carry out preoperative biliary decompression. According to the results of our studies, radical surgical treatment was made possible in less than 15% of patients admitted to an emergency clinic, with MN of the hepatopancreatoduodenal zone, complicated by MI (Table).

At the same time, we noted that the prevalence of palliative operations over radical interventions was with all localizations of MN and amounted to 86,5%. So,

**The structure of palliative and radical surgical interventions, abs. number (%**

| Localization of a malignant neoplasm | Palliative | Radical | Total |
|---|---|---|---|
| Cancer of the liver and intrahepatic bile ducts | 4 (7.8) | – | 4 (7.8) |
| Cancer of the gallbladder and extrahepatic bile ducts | 2 (3.8) | – | 2 (3.8) |
| Cancer LDP | 1 (1.9) | – | 1 (1.9) |
| Pancreas cancer | 36 (69.2) | 7 (13.5) | 43 (82.7) |
| Stomach cancer | 2 (3.8) | – | 2 (3.8) |

with pancreatic tumors, whose share was 82,7%, the possibility of radical treatment was only 13,5%. With similar localization C.C. Ciambella et al. [11] and U. Klaiber [12] report the possibility of a PDR of 20-57%. Such significant differences, in our opinion, are a consequence of the late treatment and admission of patients to the surgical clinic, the progression of the disease, the presence of distant organ metastases, as well as purulent-septic complications of MN. After performing radical surgical interventions in the postoperative period, complications occurred in 2 (28,6%) of the observed patients. In both cases, the failure of pancreatoeunoanastomosis was noted, which required repeated surgical interventions, with one patient subsequently dying from sluggish peritonitis.

**Conclusion.** Thus, at MI of neoplastic origin, two-stage surgical treatment tactics using antegrade transcutaneous biliary drainage is quite effective and often used in urgent practice. The use of modern materials and proven techniques for the decompression of the biliary system is accompanied by a relatively low level of intra- and postoperative complications. A continuous analysis of the clinical experience of surgical treatment of patients with MI of neoplastic genesis allows the necessary correction of tactics in order to improve treatment outcomes. In addition, given the high incidence rate of malignant necrotizing organs of the pancreatobiliary zone in RS (Y), as well as data on a significant percentage of patients with stage III and IV disease who underwent treatment in the clinic, it is necessary to conduct targeted studies that will determine the main directions of measures for early diagnosis and timely initiation of treatment, including surgery, in this category of patients.

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