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## **DIFFERENTIAL DIAGNOSTIC AND SURGICAL TREATMENT OF PATIENTS WITH KLATSKIN'S TUMOR**

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**Abstract.** *Klatzkin tumor is characterised account by 10-20% of all tumors of the liver ducts. Most often, patients report the presence of jaundice, which is the occasion of treatment in hospital. The purpose of this study was to evaluate the results of surgical treatment. For diagnosis using standard clinical trials, as well as ultrasound, performed percutaneous transhepatic cholangiography, endoscopic retrograde cholangiopancreatography, computed tomography, magnetic resonance imaging to determine the extent of tumor invasion of hepatic ducts used anatomical classification H. Bismuth – M.V. Corlett. After the study came to the conclusion that patients with Klatzkin tumor preparation for surgery should include biliary decompression to minimize cholestasis and portal vein embolization of branches to increase the weight of the remaining part of the liver, which significantly reduces the risk of postoperative liver failure and mortality. Total caudal lobectomy and extended lymphadenectomy yavlyayutsya obyazatelnyimi elements of the operating protocol of surgery at hilarnykh cholangiocarcinoma. When local tumor invasion into a branch of the hepatic artery and portal vein it is possible to plastic correction.*

**Key words:** *liver surgery, imaging, lobectomy, lymphadenectomy*

Malignant tumors of the bile ducts of the liver, and the portal area are an actual problem in biliary surgery. Klatskin Tumor (KT), extrahepatic cholangiocarcinoma, proximal bile duct cholangiocarcinoma constitute about 10-20% of all tumors of the biliary ducts, 70-80% of cases of cancer of the bile duct, and about 15% of all malignant tumors of the liver. In literature there are also "the portal cholangiocarcinoma," "hilus tumor", "gate liver cancer." Cancer of the bile ducts makes 1-3% of all malignancies. In autopsy, of cancer common bile duct is detected in 0.01% of cases [1,2,3,5,10].

Klatskin tumor affects mainly the common hepatic duct at the level of confluence, and can then move to the right or left hepatic duct. This tumor - epithelial origin is usually malignant nature, with infiltrative growth form [4,6,7,11,12,13].

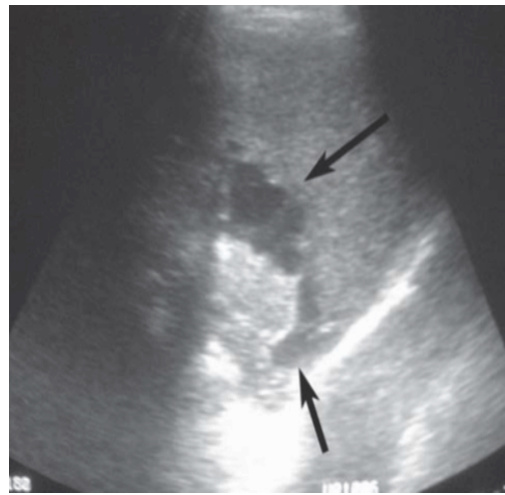
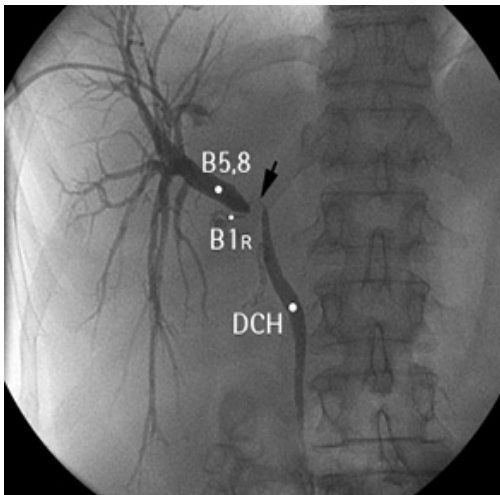
The clinical symptoms observed, do not differ from the manifestations of cancerous lesions of other organs of the hepatopancreatobiliary system. Most often, patients report the presence of jaundice, which is the reason for treatment in hospital. The intensity of cholestasis may be different from subclinical manifestations of hyperbilirubinemia and painless obstructive jaundice in a few cases up to the terminal stage of jaundice (93%); it does not usually depend on the level of the lesion and is proportional to the duration of the disease. In addition, if jaundice is long, high cholemia, there may be expressed metabolic disorders - endogenous intoxication symptoms, pruritus, cholangitis, liver failure, loss of body weight. The duration of such a state before going to the hospital is from 2-3 days to 2-3 weeks [14-23].

**Materials and methods.** The purpose of this study was to evaluate the results of surgical treatment Klatskin tumor. The study included 49 patients, of whom 31 (63.2%) were women and 18 (46.6%) were men with cholangiocarcinoma, which in the period from April 2001 to October 2015 performed surgery. As a rule, the volume of liver parenchyma infested by the cholangiocarcinoma is small, at the same time, as a result of the defeat of the duct system, the volume of resected functioning parenchyma may be 70-80% [21,22]. The presence of cholestasis significantly impairs functional condition and regenerative ability of a small amount of the remaining part of the liver. Due to frequent invasions of vessels of hepatoduodenal ligament, pancreas and duodenum surgery, a complemented stage of vascular plasty or pancreatoduodenectomy can significantly degrade its portability. For the prevention of liver failure cholestasis should be minimized. Permissible levels of hyperbilirubinemia in the preoperative period, should be  $<60\text{mmol} / \text{l}$ , preferably  $<3\text{0mmol} / \text{l}$ .

As for methods of screening used for diagnosis of klatskin tumors, at first we used ultrasonography(US). In this study, to determine the presence of tumor is usually not possible, but there is expansion of intrahepatic bile duct obstruction above

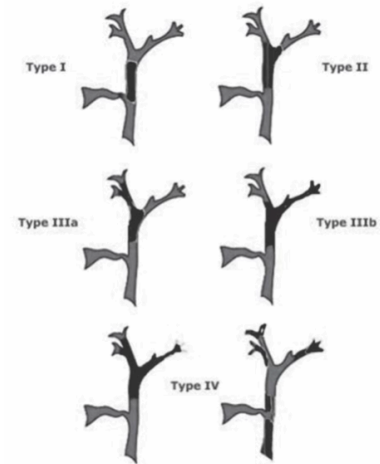
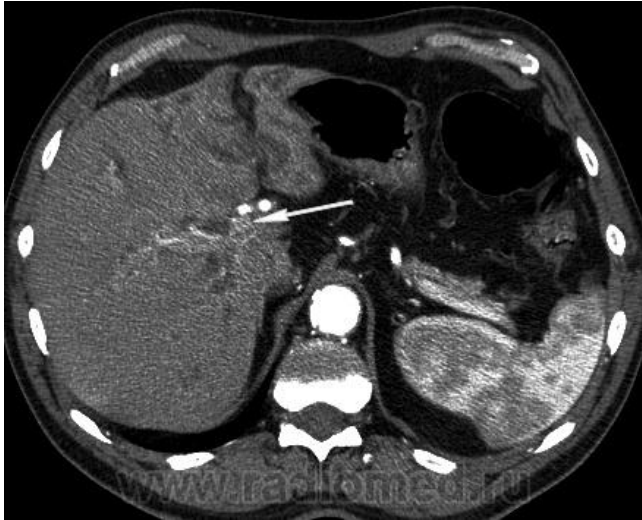
the tumor. In rare cases (10-12%) in the echogenic (iso / hyper) a rounded shape can be found forming in the gate of the liver, in the projection of the confluence of the hepatic ducts with irregular indistinct contours, 2-6.5 cm in diameter in the liver parenchyma at the bifurcation . The overall accuracy of ultrasound reaches 75-85% of cases when determining tumor mass, and up to 92% - when determining the level of obstruction.

If there was problem with percutaneous liver drainage at a moderate dilatation of the intrahepatic ducts, percutaneous transhepatic cholangiography (PTHC) was performed under ultrasound, which is the "gold standard" in determining the nature of the lesion of the biliary tract, especially in the proximal section of the biliary tract. It has a sensitivity of about 95.2%, specificity - 87%, the estimation of ability to resect- 93%, determination of position - up to 100%. At the same time you can get a biopsy by trepanation of the tumor using ultrasonography for verification of the diagnosis, and in the future - cholangiography with percutaneous liver cholangiostomy.



Endoscopic retrograde cholangiopancreatography (ERCP), is used when there is obstruction by tumor (complete obturation of the lumen of the duct) of proximal or central localization, when combined with PTHC under ultrasound double-contrast enhancement can more accurately determine the duration of the pathological process and define the scope of the operation. ERCP sensitivity in determining the lower limit level gall block is about 92%, also this method does not provide information about the state of the ducts above the obstruction. To reduce the risk of acute suppurative

cholangitis and biliary hypertension due to blockage, direct contrast diagnostic methods should be used or internal and external drainage of the biliary tract.



Computed tomography (CT) often helps to visualize the tumor, enlarged bile ducts, and lymph nodes. But this method is more informative in the performance of drainage of the hepatic duct. In addition, CT allows us to estimate the degree of invasion of the blood vessels by the tumor, which can be regarded as signs of infiltration of the vessel by tumor, around or narrowing of the portal vein or its branches. There may be non-specific signs: atrophy of one of the lobes of the liver with hypertrophy of the contralateral lobe, either that or other evidence of tumor invasion into the branches of the portal vein. With the defeat of the tumor process blood vessels of the liver gate, clearer and more detailed information can be obtained using enhanced spiral CT (with IV contrast) and angiography.

Accuracy of CT is 85-88%, and the determination of obstruction - up to 98.1%. Ultrasound and CT with obtaining a biopsy improves diagnostic accuracy up to 94-96%

The best method of investigation in the Klatskin tumor can be considered magnetic resonance imaging (MRI), which allows not only to determine the precise location of the tumor, but also to visualize the detailed structure of the blood vessels of the liver. In order to determine the spread of tumor invasion of hepatic ducts used anatomical classification H. Bismuth – M.V. Corlett:

- Type I - common hepatic duct tumor without infiltration of its bifurcation (place of confluence of the ducts);
- Type II - the tumor extends into the bifurcation of the bile duct without involving the hepatic ducts, obstruction of the common hepatic duct tumor;
- Type IIIa - mainly invasion of bifurcation and right hepatic duct;
- Type IIIb - predominant invasion of bifurcation and left hepatic duct;
- Type IV – multicentric spread tumors or tumor invasion of both hepatic ducts and their branches.

According to this classification type I was 16 (32.7%) patients; Type II in 19 (38.9%); IIIa 6 (12.2%); IIIb in 5 (10.2%); Type IV in 3 (6.1%) patients. Life span of patients with proximal cholangiocarcinoma is an average of 4-6 months after diagnosis.

The main method of treatment of tumors of the extrahepatic bile ducts is surgical. But it presents certain difficulties, which are due primarily low and high frequency of postoperative complications and adverse outcomes after radical or palliative surgery. Resection of the ducts and the formation of the liver gate anastomoses, bile abductor, is extremely dangerous, due to the location of the tumor in the liver and the gates close proximity to the hepatic artery and portal vein, and liver parenchyma. Also an important fact is that the majority of patients diagnosed with KT in the late stages involve obturation biliary tract and obstructive jaundice. Presence of hyperbilirubinemia increases risk of postoperative complications and mortality, however, before embarking on etiological surgery, perform decompression of the biliary system, which can be one-sided and, using PTHC or endoscopic stenting. Bilirubin level should not exceed 50 mmol / l. Planned surgery can be performed 2-3 weeks after decompression. KT in most cases it is small, so as resection surgery uses a fork resecton of the bile ducts with subsequent formation hepaticojejunoanastamosis with the passage of food from the jejunal loop. This operation is accompanied by a low number of postoperative complications and mortality, but after, it is not always possible to achieve complete resection. In the propagation of tumor, segmental resection of several segments of the liver, up to the

right or left hand extended hemihepatectomy to delete or save the caudate lobe. However, this is accompanied by a high rate of postoperative liver failure, which often leads to death. In severe general condition of elderly patients and IV type lesions with extensive tumor invasion recommend external or internal drainage on a hidden drainage through the tumour.

Radical surgery to remove the tumor and resection of the common hepatic duct are possible only with type I for Bismuth, and at II, IIIa, IIIb type - only when there is anatomical liver resection on the side of the pre-emptive destruction of liver bile ducts, with resection of the extrahepatic bile ducts and the possibility of resection of hepatic artery or portal vein, I segment of the liver. Disease recurrence after radical surgical intervention is usually detected in a period of from 0.5 to 5 years after surgery. Patient survival is about 12% (to 15 years), 94% (1 year after the surgery).

Laparotomic Palliative surgery for Klatskin tumor is in the inner or outer extraction of bile, but mortality in this is high (17%). Life expectancy after external drainage of 1.4-5 months, after an internal - 3,6-10,4 month.

Effective and relatively safe to remove bile hypertension allow minimally invasive procedures, which are widely used. Among them: the endoscopic and percutaneous transhepatic cholangiodrainage, stenting of the bile duct, endoprosthesis tumor stricture or bile ducts, and others.

**Results and discussion.** In the period from April 2001 to October 2015 in Kharkov Regional Hospital 49 patients with Klatskin tumor were operated on. Of these, 36 patients underwent radical surgery. In 13 patients underwent explorative laparotomy. Operability was 70.2%, which corresponds to international data. The average time of surgery was ( $564 \pm 56$ ) minutes, the mean intraoperative blood loss was ( $836 \pm 240$ ) ml.

10 (27.8%) cases required surgical intervention in the vessels of hepatoduodenal ligament. 17 (47.2%) patients underwent resection of the portal vein with Confluence portoplastic anastomosis end-to-end. The average time required to complete portoplasty was ( $18 \pm 3$ ) min. For adequate exposure of the distal portion of

the portal vein transfissuralny approach was used. During portoplasty, arterial blood flow the remainder of the liver was maintained, minimizing ischemia.

The average residence time of patients in the intensive therapy after the operation was 2.4 days, the average time spent in the surgical hospital patients after surgery was 35.6 days. Both figures are significantly higher than those for patients after liver resections over the focal hepatic lesions. Overall mortality was 3 (6.1%) patients. The main cause of death was postoperative hepatic failure in combination with sepsis, which arose in 2 (4.1%) patients. In 1 patient the cause of death was bleeding from arrosive hepatic artery and portal vein.

### **Conclusions.**

1. Preparation of Klatskin tumor patients for surgical intervention should include biliary decompression to minimize cholestasis and portal vein embolization of branches to increase the weight of the remaining part of the liver, which significantly reduces the risk of postoperative liver failure and mortality.
3. Total caudal lobectomy and extended lymphadenectomy are mandatory elements of the operational protocol of surgery at hilar cholangiocarcinoma.
4. Local tumor invasion of the branches of the hepatic artery and portal vein at the possibility of its plastic correction is not a contraindication to complementary surgery.

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### **Диференційна діагностика та хірургічне лікування хворих з пухлинами Клацкіна**

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**Резюме.** Пухлина Клацкіна становлять близько 10-20% всіх новоутворень протоків печінки. Найчастіше хворі відзначають наявність жовтяниці, що і є приводом звернення до лікарні. Метою цього дослідження було вивчення результатів оперативного лікування. Для проведення діагностики використовувалися стандартні клінічні дослідження, а також ультразвукове дослідження, виконувалася черезшкірна чреспеченочна холангіографія, ендоскопічна ретроградна панкреатохолангіографія, комп'ютерна томографія, магнітно-резонансна томографія, для визначення поширення пухлинної інвазії по печінковим протоках використовувалася анатомічна класифікація Н. Bismuth - М.В. Corlett. Після проведеного дослідження прийшли до висновків, що підготовка хворих пухлиною Клацкіна до оперативного втручання повинна включати билиарну декомпресію для мінімізації холестази емболізацію гілок ворітної вени для збільшення маси залишається частини печінки, що істотно знижує ризик розвитку післяопераційної печінкової недостатності та летальність. Тотальна каудальна лобектомія і розширена лімфаденектомія являютьсяобязательними елементами операційного протоколу хірургічних втручань при хіларних холангіокарціноми. При локальній пухлинної інвазії в гілку печінкової артерії і ворітної вени можливо її пластична корекція

**Ключові слова:** печінка, хірургія, томографія, лобектомія, лімфаденектомія

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### **Дифференциальная диагностика и хирургическое лечение больных с опухолями Клацкина**

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**Резюме.** Опухоль Клацкина составляют около 10–20 % всех новообразований протоков печени. Чаще всего больные отмечают наличие желтухи, что и служит поводом обращения в больницу. Целью настоящего исследования явилось изучение результатов оперативного лечения. Для проведения диагностики использовались стандартные клинические исследования, а также ультразвуковое исследование, выполнялась чрескожная чреспеченочная холангиография, эндоскопическая ретроградная панкреатохолангиография, компьютерная томография, магнитнорезонансная томография, для определения распространения опухолевой инвазии по печеночным протокам использовалась анатомическая классификация Н. Bismuth — М.В. Corlett. После проведенного исследования пришли к выводам, что подготовка больных опухолью Клацкина к оперативному вмешательству должна включать билиарную декомпрессию для минимизации холестаза и эмболизацию ветвей воротной вены для увеличения массы остающейся части печени, что существенно снижает риск развития послеоперационной печеночной недостаточности и летальность. Тотальная каудальная лобэктомия и расширенная лимфаденэктомия являются обязательными элементами операционного протокола хирургических вмешательств при хиларных холангиокарциномах. При локальной опухолевой инвазии в ветвь печеночной артерии и воротной вены возможно ее пластическая коррекция.

**Ключевые слова:** печень, хирургия, томография, лобэктомия, лимфаденэктомия

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