

## CLINICAL STUDY

# Hepatocellular carcinoma – evaluation of a group of 74 patients treated at the surgical department

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**Abstract:** The authors present their experience with treatment of 74 patients operated on for hepatocellular carcinoma. Resection could be performed only in 44 patients. In 19 cases, a catheter for regional chemotherapy was implanted. Tumor destruction with alcohol was performed 4 times and radiofrequency thermal ablation 5 times either as a single intervention or in addition to the resection. Liver cirrhosis was verified by histology in 29 operated patients. Hospital mortality: 2 operated patients. Median survival after the liver resection: 42 months, mean survival: 72 months. The importance of preoperative indocyanine green elimination test for the exact determination of functional capacity of the liver and the priority of radical resection as compared to the other treatment modalities are emphasized (Tab. 2, Ref. 12). Full Text (Free, PDF) [www.bmj.sk](http://www.bmj.sk).  
Key words: hepatocellular carcinoma, surgical treatment modalities, survival.

Hepatocellular carcinoma (HCC) is the most frequent primary malignant liver tumor and the fifth most frequent malignant disease in the world. Its incidence differs geographically: high occurrence is found in some Asian countries and sub-Saharan African countries (Mongolia, Korea, Thailand, China, Japan, Mozambique, Cameroon). Low incidence is found in Scandinavia, North America and Australia. The Czech Republic belongs to countries with a lower incidence (there were 195 new HCC cases in 1999 and 248 in 2004, confirmed by histology). Present increase in HCC incidence, even in economically developed countries, is attributed to hepatitis B and C. However, vaccination against hepatitis begins to diminish its role in HCC etiology.

Other frequent risk factors for HCC development are following: all liver cirrhosis, some metabolic diseases (porphyria, haemochromatosis), environmental toxins, aflatoxin and alcohol, long-term use of hormonal contraceptives and anabolic steroids. Liver steatosis is a new nosologic entity, too.

In spite of all diagnostic and therapeutic progress, HCC remains a disease with a bad prognosis which is determined by tumor stage and functional state of liver parenchyma (degree of cirrhosis). (8)

As liver surgery is a part of our program for a long time, we would like to present our experience and clinical outcomes of this serious disease.

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## Methods and results

In the time period from 1990 to 2005, a total of 471 patients with focal liver lesion were operated on in the 2nd Department of Surgery of Masaryk University in Brno. In 369 cases, there was a malignant liver tumor. 286 patients were operated on for secondary malignant lesions (mainly colorectal carcinoma metastases) and 83 patients for primary malignant liver tumors.

Histological findings of patients operated on for primary malignant liver tumor are shown in Table 1.

We evaluated 74 operated patients with standard HCC, fibrolamellar variant, and mixed hepatocellular-cholangiocellular carcinoma. The patient group included 51 men and 23 women aged 28–76 years, with a mean age of 59 years. Liver cirrhosis was proved by histology in 29 cases.

In addition to standard laboratory and clinical examinations, following examinations were performed in all patients: chest X-ray, evaluation of tumor markers (alpha-fetoprotein, CEA, CA 19-9), hematological examination, targeted angiography, contrast-enhanced abdominal CT, liver biopsy, and evaluation of indo-

**Tab. 1. Histological findings in primary malignant liver tumors.**

Histological finding	Number of patients
Hepatocellular carcinoma	63
Fibrolamellar carcinoma	9
Mixed hepatocellular-cholangiocellular carcinoma	2
Cholangiocellular carcinoma	8
Hepatoblastoma	1
Total	83

**Tab. 2. Types of resection.**

Type of resection	Number of resections
Right hemihepatectomy	12
Extended right hemihepatectomy	4
Left lobectomy	11
Segmental resection	17
Total	44

cyanine green elimination (ICG). In 8 patients, the pre/operative examination was completed by laparoscopy.

The operation was always performed with antibiotic prophylaxis. Thromboembolism prevention with a low molecular weight heparin was performed individually, according to the hematological screening and course of the operation. Its administration started usually on the operation day, in the evening.

We standardly perform a bilateral subcostal incision which we can, if necessary, extend in the midline to the xiphoid. A maximum mobilization of the liver will facilitate the resection. In case of hemihepatectomy, we ligate appropriate vessels and the bile duct before resection. In minor resections we do not perform surgical exposure of the hepatoduodenal ligament structures. We perform the liver parenchyma resection proper with blunt dissection using scissors. After their surgical exposure, we close the vessels and bile ducts with titanium clips, stitches or absorbable ligatures. We found the harmonic scalpel to be tried and trusted. Several times we used Habib Sealer enabling faster parenchyma transection. We treat the resection area with a Hot-Jet coagulator and fibrin glue (3, 11, 12).

The types of resection in our study group (a total of 44 operated patients) are shown in Table 2.

In one female patient, left lobectomy was completed with a partial resection of the diaphragm because of tumor infiltration. Eight times we performed hepatoduodenal ligament lymphadenectomy simultaneously with the resection. In 19 cases we implanted a catheter for regional chemotherapy in non-resectable tumors, 4 times we completed the operation with tumor destruction with alcohol and 5 times with radiofrequency thermal ablation (RFA). An inoperable tumor was present in 12 cases (1, 5, 9).

Postoperative complications characteristic for liver surgery occurred in 19 patients: biliary discharge through the drain 8 times, subphrenic haematoma twice, subphrenic bilioma three times, liver failure once, surgical wound infection six times.

Two operated patients died during hospitalization. One of them died of liver failure on postoperative day 21, the other died of a stroke with subsequent bronchopneumonia on postoperative day 9.

The median survival of patients after resection was 42 months, the mean survival 72 months. In 15 cases of non-resectable tumors, we performed a repeated chemoembolization (20 mg of epirubicin in 50 ml of solution with 10 ml of Lipiodol, Gelaspon). The median survival after chemoembolization was 13 months,

the mean survival 19.5 months. The median survival of patients with an inoperable tumor with systemic chemotherapy only was 9 months, the mean survival 13 months. The median survival of patients with regional chemotherapy was 15.5 months, the mean survival 27 months.

## Discussion

During preoperative examinations in patients with HCC, we pay a big attention to liver function tests. We do not use the Child–Pugh classification which, in our opinion, is not exact enough in this indication, we use the ICG elimination test. This examination will surely reveal a liver function disorder that was not detected with the use of routine laboratory examinations. The ICG elimination test will also determine the possible extent of resection (5). We used magnetic resonance imaging (MRI) in HCC diagnostics only sporadically in case of diagnostically unclear focal liver lesions. We use positron emission tomography (PET) mainly for determination of tissue viability of RFA-treated lesions and possible post-resection tumor recurrences.

In one female patient, embolization of the right branch of the portal vein was performed and after a compensatory hypertrophy of the other lobe, we performed a resection after 6 weeks (2).

We recommend liver transplantation in patients with cirrhosis and a small non-resectable tumor (3–5 cm) or 2–3 unilateral tumors without detectable invasion of vessels (4, 10).

We have not used the laparoscopic technique in patients with HCC yet. We employ it in operations of liver cysts and some superficially located benign lesions. During classical operations, especially in tumors in cirrhotic liver, we pay an attention to a sufficient surgical approach, minimization of blood loss and prevention of intraoperative hypotension. In case of a necessary hepatoduodenal ligament clamping in cirrhotic liver, we do not exceed 15–20 minutes, then we loosen the clamp for at least 5 minutes (1, 3, 6, 11). A self-evident requirement is to preserve as much parenchyma as possible. Therefore we do not usually perform anatomical resections, but simultaneously the requirement of a tumor-free resection margin of at least 1 cm must be met. The usage of the Hot-Jet coagulator, which we always use for treatment of the resection area, further increases the tumor-free margin by 0.5 cm.

The difference between the median and mean survival of patients after HCC resection is caused by the fact that 6 operated patients from the study group in whom cirrhosis was not present have been living without symptoms of a recurrence for more than 10 years. On the contrary, progression of cirrhosis diminishes the median survival.

## Conclusion

The diagnostics and treatment of HCC requires a cooperation of an oncologist, surgeon, radiologist and gastroenterologist – specialists in the given problems. Elective operations must be performed at specialized departments dealing with liver surgery as a part of their program. Experienced staff is a prerequisite

site for a higher number of resections indicated and performed. Other treatment modalities, although less invasive (chemoembolization, regional chemotherapy, radiofrequency thermal ablation) provide much lower patient's chance of longer survival. To improve therapeutic outcomes, it is necessary to increase the number of patients with a resectable tumor by a timely diagnosis. Regular check-ups of patients with known risk factors of HCC development are possible.

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