



# The results of surgical treatment of metastatic liver tumor

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## SUMMARY

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**Background:** The aim of our study was to analyze the survival of patients who were operated from liver metastases. This paper is a retrospective study of the case reports from the Clinic for Operative Oncology – Oncology Institute of Vojvodina. The study included all the patients treated operatively for secondary malignant liver tumors in the period from May 2003 to May 2007.

**Methods:** The study included 33 patients (17 men and 16 women). The mean age of patients was 57.8 years (range, 27-75 years). In 23 patients, (69.7%) metastases were of colorectal origin, while in 10 patients (30.3%) metastases originated from some other organs.

**Results:** Hepatectomies were performed in 54.54% and metastasectomies in 45.45% of patients. More severe postoperative complications (which required repeated surgery) were registered in 3.03% of patients. Intraoperative mortality was 3.03% and postoperative mortality was 12.12%. Liver re-resection was performed in 21.21% of patients. An overall one-year survival was 75.76%, and a three-year survival was 43.75%. One-year survival in patients with colorectal metastases was 86.96% and three-year survival was 50%, while in patients with metastases originating from some other organs, one-year survival was 70% and three-year survival was only 25%. In-hospital mortality in patients with colorectal metastases was 8.7% while in patients with non-colorectal metastases it was 30%.

**Conclusion:** The aim of this paper was to show that only surgical removal of metastases can lead to life quality improvement and to prolongation of the overall survival and that modern neoadjuvant and biological therapies may increase resectability of the inoperable changes.

**KEY WORDS:** Neoplasm Metastasis; Liver Neoplasms; Surgical Procedures, Operative; Treatment Outcome; Survival Rate

## INTRODUCTION

Liver is an organ, which, most often, metastasizes from the colorectal carcinoma, breast carcinoma, malignant lung tumor, and malignant genitourinary tract tumor. Surgery of liver metastases is indicated if the disease is limited to liver, when the primary tumor was radically removed. In some specific cases, a synchronized resection of the primary tumor (most often colon tumor) and resection of the metastatic disease are performed. This is the reason why the diagnostics of the extrahepatic disease, after any surgically treated malignancy, is of primary importance before consideration of any surgery of metastases (1-3).

Metastases appearing only in liver are rare and mostly originate from the colorectal carcinoma. The only therapy, which may lead to healing, is surgical removal of metastases. In everyday surgical practice, the number of patients, operated on due to liver metastases of the colorectal carcinoma is very small in comparison to frequency of the primary carcinoma and its tendency to metastasize (4,5). Unfortunately, at this moment, surgical resection of colorectal carcinoma metastases is possible in only 15% to 25% of cases (6,7).

Operative treatment of liver metastases is justified only if there is a probability that healing is achievable. In practice, unfortunately, it is difficult to define the term *probability of healing* because the published papers sometimes lack details. Excision of one or more metastases from liver can be performed only if all the observed metastatic changes can be removed and if there is no such metastatic change left, which is not visible during the operation, but which is confirmed by visual techniques. In practice, this means that not only those metastases, easily visible should be removed.

Those barely visible or invisible should not be left over. Basic indications for liver resection due to liver metastases are that they are not present in other organs, such as lungs or brain. Besides this, it is performed in all other cases, regardless the number of metastases, if after resection, there is, at least 25% of total volume of healthy liver tissue left, i.e. about 40% of total liver volume if the aggressive neoadjuvant therapy was applied (8, 9). Local recurrences of rectal tumor in pelvis minor and carcinosis of diaphragm are not contraindications for liver resection if a protective clearance up to a healthy tissue can be achieved. These principles, when they are respected, give good results and five-year survival is from 30% to 40% (7-13).

About 25% of patients with colorectal carcinoma show presence of portogenic metastases in liver during the initial operation. Metachronous metastases are discovered later, after the initial operation, and they occur in 30% of patients. Synchronous metastases of colorectal carcinoma may be removed during the initial surgery or after some time by a new surgery (13). Chemotherapy and biological therapy may increase an overall resectability rate, which enables the surgeons to perform resection in additional 15% to 30% of patients with initially unresectable metastases (14,15).

## PATIENTS AND METHODS

This paper is a retrospective study of the case reports from the Clinic for Operative Oncology – Oncology Institute of Vojvodina. The study included all the patients with radically operated primary tumors who were later operatively treated for secondary malignant liver tumors from May 2003 to May 2007. Blood samples were taken from all patients for standard laboratory analyses (including tumor markers) and they all were radiologically

examined (including MRI). After a detailed diagnostics, the patients were sent to the liver tumor commission that made the decision concerning any further type of treatment. Prior to that, the analysis of the oncological treatment was performed (data on earlier surgery, possible chemotherapeutic treatment, its duration, and results). In all patients, who had the resection, a histopathological analysis of the resected tumor was performed. All the patients were later monitored by the competent oncologist and, if necessary, the additional examinations were performed (CT or MRI).

## RESULTS

The study included 33 patients who, during the period from May 2003 to May 2007, were operatively treated for secondary malignant liver tumors at the Clinic for Operative Oncology of the Oncology Institute of Vojvodina. The mean age of patients was 57.8 years (range, 27-75 years).

Clinical characteristics of the surgical treatment of patients is given in Table 1.

**Table 1. Characteristics of patients**

Age structure of the patients	N	%
to 49 years	6	18.18
50 – 59 years	11	33.33
60 – 69 years	12	36.36
over 70 years	4	12.12
Gender structure of the patients	N	%
Men	17	51.5
Women	16	48.5
Origin of metastases	N	%
Colorectal metastases	23	69.7
Metastases from other organs (total):	10	30.3
Stomach	4	12.12
Breast	3	9.1
Pancreas	1	3
Ovary	1	3
Hodgkin disease	1	3
Neoadjuvant therapy	N	%
Without chemotherapy	8	24.24
With neoadjuvant therapy	25	75.75
Synchronized and postponed surgeries of metastases	N	%
Synchronized surgeries	9	27.27
Postponed surgeries	24	72.72
Smaller liver resections (metastasectomies) and hepatectomies	N	%
Smaller liver resections (metastasectomies)	15	45.45
Hepatectomies	18	54.54

More severe postoperative complications (which required reoperation) were registered in 1 patient (3.03%). In other patients there were no significant more serious complications registered.

Intraoperative mortality was 3.03% (1 patient). Postoperative mortality (death occurring in the period of one month after the surgery) was 12.12% (4 patients). A one-year survival was 75.76%. A three-year survival was calculated only for those patients who were operated on before December 31, 2005 (16 patients) and it was 43.75% (14).

## DISCUSSION

Liver is a predilective localization where, many tumors metastasize. In clinical practice, liver metastases are only one of manifestations of the general dissemination of a tumor.

In this study, most of the patients with operatively treated liver tumors belonged to older population (the 6<sup>th</sup> and the 7<sup>th</sup> decade of life). This result is in correlation with the most often occurrence of tumors at that age, so it was understandable that metastatic changes in liver also appeared at that time. The incidence of secondary liver tumors (especially colorectal metastases) is somewhat higher in men, which is in accordance with the literature data. This is also supported by the fact that in 4 female patients, the metastases originated from the breast and ovaries (14).

Metastases in liver were, most often, of the colorectal carcinoma origin (69.7%), rarely of any other tumors. This type of carcinoma represented a carcinoma where chemotherapy widely contributed to control of metastatic disease, thus, there was a significant therapeutic interval during which the treatment of metastases was enabled, first of all the surgery (5,16,17).

Re-resection of liver was performed in 7 patients (21.21%). More and more studies prove the benefit of reoperation of metastatic liver tumors (6).

Resections of liver due to metastases have acceptable morbidity and mortality. The mortality in published papers is mostly about 5% for specialized institutions (13). In our study, Intraoperative mortality was 3.03%. The operative risk depends on the complexity of the resection, preoperative bleeding, and the level of destruction of the liver parenchyma. In the studies, the postoperative mortality is about 5%. In our study, the postoperative mortality was somewhat greater and it was 12.12%.

This research provided the results on overall one-year survival of 75.76% and a three-year survival of 43.75%. Many studies confirm similar data. According to these studies, a five-year survival is about 25% to 40% (18).

The chosen method of treatment for colorectal metastases is the surgical treatment, but it gives only potential healing (18). Nowadays, it is not possible to precisely determine the survival of the untreated patients with liver metastases of the colorectal carcinoma because most of the patients are treated with adjuvant, or some other kind of palliative therapy. Without a surgical intervention, 60% to 75% of patients would die during the first year of the disease and a three-year survival is almost 0%. A one-year survival in patients with colorectal metastases, in our study was 86.96% and a three-year survival 50%. Data from the other authors show a one-year survival of up to 90% and, even, 65% for a one-year and three-year survival (18, 19). The role of liver resection in case of non-colorectal primary tumors is less known. Schwartz's literature survey showed that only some modest progress could be expected in secondary tumors originating from esophagus, stomach, small intestine, and pancreas. The patients with primary genitourinary tumors had higher percentage of survival. An overall one-year, three-year, and five-year survival was 80%, 45%, and 37%, respectively. Liver resection of non-colorectal, gastrointestinal, primary tumors mostly

had bad prognosis (20). In our study, a one-year survival in patients with non-colorectal metastases was 70%, while a three-year survival was only 25%.

A one-year and three-year survival after the surgery of non-colorectal metastases in liver is less significant than after the surgery of colorectal metastases. Furthermore, intrahospital mortality is significantly higher in this group of patients.

### Conflict of interest

We declare no conflicts of interest.

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