

Surgical Therapy of Hepatic Metastases Aimed on Assessment of Alternative Techniques in Non-Resectable Metastases

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1. Summary

Certain surgical principles and operation techniques are used for centuries. Nobody can predict moving the limits and ranges to which point are these techniques possible to reach the point for the most successful outcome for patient, his quality of life and life of itself. Some surgical treatments are considered as standards, but years ago seemed impossible to perform. The limits of surgeries moved forward thanks to the modern technical accessories, which are modernizing regularly. This article focuses on treatment of non-resectable primary and secondary hepatic metastases.

2. The Goal of Using Modern Technical Equipment

According to worldwide studies, the surgical resection has the best outcome in survival rate and disease free interval. In the past, the patients, who weren't able to overcome the surgical treatment, whether for disease generalization - extra-hepatic dissemination, or for locally advanced findings - close contacts to vascular structures, where treated by system or regional chemotherapy.

In presence the progress of new possibilities of surgical treatment in patients with extra-hepatic affection with pulmonary metastases are in cases with adequate localization of these metastases treated multidisciplinary - removing of the lesion from pulmonary parenchyma, followed by removing also lesions of hepatic parenchyma. Different situation is inadequate local findings - number of lesions,

their localization of contact to vase-biliary structures, size of lesion in correlation with residuary hepatic parenchyma. This group of patients gets the chance of higher survival rate and quality of life thanks to new instrumental devices, because the treatment by chemotherapy didn't achieve better survival rate. Combination of resection treatment followed by devitalization of non-resectable lesions, gives these patients not only possible higher chance of survival but also quality of life. Devitalization of primary or secondary tumor is possible by different modalities which are cryo-destruction (CD), radio-frequency ablation (RFA) and laser-induces thermo-destruction (LITD) [1].

In connection with hepatic surgery there came to modernization of surgical resection techniques from digito-clasis and pean-clasis, through ultrasound destruction of hepatic parenchyma (CUSA), into delicate techniques of vase-biliary structure preparation by water jet - scalpel (Helix). These techniques of hepatic resection also minimize blood loss with further need of haemo-substitution, decreased the time needed for operation and lowered the post-operation morbidity.

3. Alternative Techniques

3.1. Cryo-destruction (CD)

Cryo-destruction uses selective controlled application of low-heat to desctruct pathological tissue, in temperatures -50 degrees Celsius, there comes to necrosis of the tissue. This affect on biological

cells is caused by intracellular creation of ice-crystals [2]. Using cryo-destruction is possible to devitalize the metastases and is suitable to use also for non-resectable lesions. This technique was used on patient with meta chronic metastasis of colo-rectal carcinoma in VI segment of liver with size 4x5 centimeters. To reach the temperature of -95 degrees Celsius used two cryo-probes, two cycles within 35 minutes (Figure 1). Followed by resection of metastasis and resection line was frozen also by cryo-destruction (Figure 2). Histological findings were 100% necrosis of pathological tissue.



Figure 1: Insertion of cryo-probes into liver metastasis



Figure 2: frozen resection line

3.2. Radio-Frequency Ablation (RFA) and Laser-Induced Thermo-Destruction (LITD)

In RFA there is used radio-frequency energy for thermic destruction of tissue, or laser-induced thermo-destruction. The limitation of this method is minimal 2 centimeter distance from major vascular structures. Advantage is the possibility of application of percutane method under MRI. This method was used on higher number of patients in order to detect the efficiency of the method.

Single metastases after thermo-destruction were resected and histologically examined, where there were different levels of thermic destruction, but in some cases, there were present of adenocarcinoma cells on the periphery in the terrain of thermic destruction either with using radio-frequency ablation or laser-induced thermo-destruction. In examined lesion there were three histologically different layers:

1. Central necrosis with structural mass
2. Medial desmoplastic layer with adenocarcinoma cells
3. Outer fibrous layer without pathological cells (Figure 3).

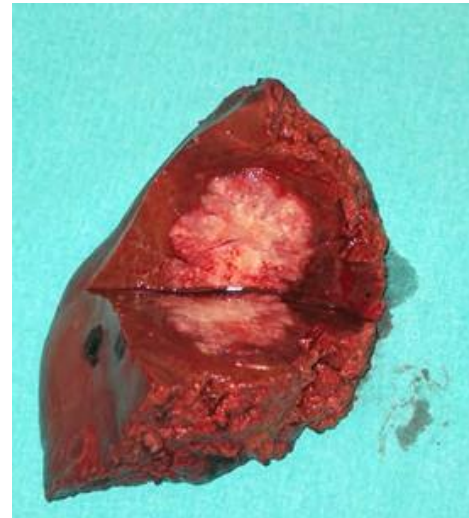


Figure 3: resected metastasis after thermo-destruction



Figure 4: metachronic lesion after cryo-destruction 3 years after left-side lobectomy

4. Conclusion

These methods are able to reach a different levels of destructions of metastatic lesions, but from the view of surgery and oncology, these modalities cannot be classified as R0 resections, because there isn't possibility of persistence of malignant cells. These methods are able to increase the survival rate with combination of hepatic resection, or it is the choice of treatment in cases where there is not possibility of surgical resection, such as in patients of left-side lobectomy in synchronic metastasis of colorectal carcinoma and after 3 years disease free interval after primary resection (rectum, hepar) where was single meta chronic lesion of right lobe. With overall survival rate 6 years.

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