International Journal of Engineering and Science Invention (IJESI)
ISSN (Online): 2319-6734, ISSN (Print): 2319-6726
www.ijesi.org ||Volume 13 Issue 10 October 2024 || PP 36-39

Radio Frequency Ablation of Solid Tumors in Combined Treatment of Malignant Neoplasm

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Abstract: *The process of tumor metastasis has been and remains perhaps the most difficult aspect of clinical oncology to diagnose, the study of which has received great attention in recent years. According to various authors, the frequency of metastasis in malignant neoplasms varies from 19-34% [1,2,5].*
At the same time, it should be noted that some researchers highlight geographical features of the frequency of metastasis of individual tumors. Thus, in the countries of South America, the frequency of metastasis of lung cancer to parenchymal organs is recorded 2 times more often than in the countries of Southeast Asia, but this question remains rather rhetorical and highly debatable according to a number of scientists [5].
In recent years, approaches to the treatment of metastatic lesions have been modernized and improved. One way or another, surgical methods of exposure - metastasectomy, radiation therapy, drug therapy, including modern immuno and targeted agents - are widespread and applicable. [3,4]. At the same time, minimally invasive, highly effective treatment methods, radiofrequency ablation, are widely used in clinical practice.
Radiofrequency ablation of primary and metastatic solid lesions is a method of exposure to radiofrequency ultrashort wave heating of tumor tissue with immediate cooling, a pronounced zone of demarcation and necrobiosis.
According to the observations of Japanese colleagues, the median 5-year survival rate of metastatic colorectal cancer using radiofrequency ablation is 56%, while the same predictor reached 53% with metastasectomy, however, taking into account the length of hospitalization, the volume of intervention and the frequency of postoperative complications, the observations of Japanese colleagues are really impressive.Considering the clinical variability of metastatic lesions of parenchymal organs and their frequency of occurrence, the question of a minimally invasive, highly effective, clinically and economically justified method of treatment is acutely increasing

Date of Submission: 14-10-2024 Date of Acceptance: 30-10-2024

Purpose of the study: to evaluate the immediate results of radiofrequency ablation of primary and metastatic lesions in the combined treatment of malignant neoplasms.

I. Materials and methods:

We studied the immediate and long-term results of treated cases of patients using radiofrequency ablation for primary and metastatic lesions of the liver parenchyma. In total, in the period from 2023-2024, 12 patients

were treated for the main and metastatic process, where a combination of radiofrequency ablation was used, followed by continuation of palliative polychemotherapy/targeted therapy.

All patients were ranked according to gender, morphological type of tumor and the nature of the metastatic tumor process: the number of men and women was 4 (33.3%) and 8 (66.6%), respectively. All patients had histologically verified primary or metastatic lesions of the liver parenchyma, radiological confirmation of the metastatic process.5 cases of metastatic process were metastatic ovarian cancer with a single lesion of the right lobe of the liver up to 3.5 cm in greatest dimension, which amounted to 41.6%, in 3 cases metastatic colorectal cancer with a single lesion of the right lobe of the liver parenchyma with a single lesion 3 .0 cm in the greatest dimension, which amounted to 25%, as well as 4 primary hepatocellular lesions of the left lobe of the liver parenchyma against the background of cirrhotic transformation as a result of viral hepatitis "C" with 2.5 cm in the greatest dimension, which accounted for 33.3% of cases, respectively. The somatic status of the patients at the time of treatment was consistent ECOG 0-2 points, Karnovsky 80-90%. In patients with metastatic liver disease in colorectal cancer and ovarian cancer after RFA, chemotargeted therapy regimens in standard therapeutic doses were continued. The observation period was 8 months.

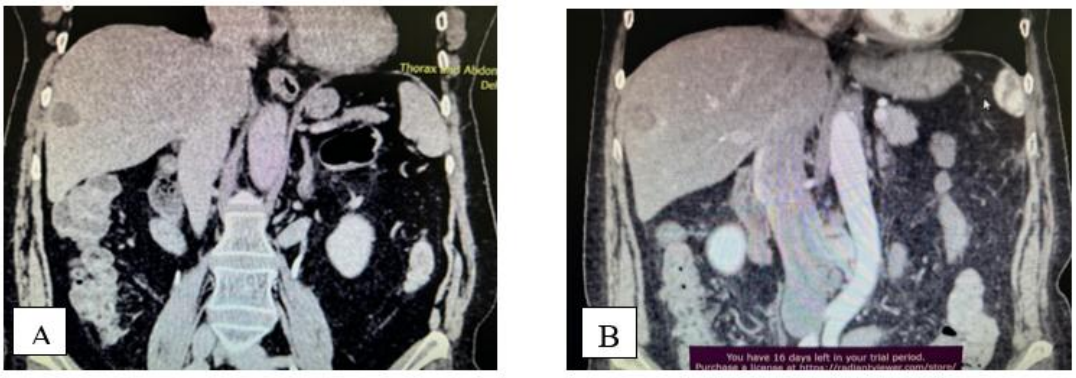
II. Results And Discussion:

According to the results of control tests and examinations, radiologically confirmed lysis of the tumor focus was achieved in all 12 cases after radiofrequency ablation. Control was carried out after 3 and 6 months using contrast-enhanced MSCT. In 1 patient (12%) with primary hepatocellular carcinoma, a de novo lesion was noted in the right lobe of the liver, outside the area of RFA; in the control lesion, there was no evidence of an active tumor lesion, which was also confirmed by control angiography. In all cases, the average stay of a patient in a bed was 5 bed days, exceeding the maximum of 7 days from the start of hospitalization until the patient was discharged from the hospital. Among the side effects and complications after radiofrequency ablation, we noted the appearance of body temperature in only 2 patients, which amounted to 24% on the 3-4th day of the postoperative period, which was associated with tumor lysis syndrome. Also, among laboratory tests in the same category of patients, a transient increase in the level of urea and alkaline phosphatase was noted. Against the background of symptomatic therapy, by the 7th day the phenomena were stopped with the normalization of blood counts.

We have presented several cases of complete resorption of the tumor focus, as well as the formation of a capsule with a zone of necrobiosis when using radiofrequency ablation.

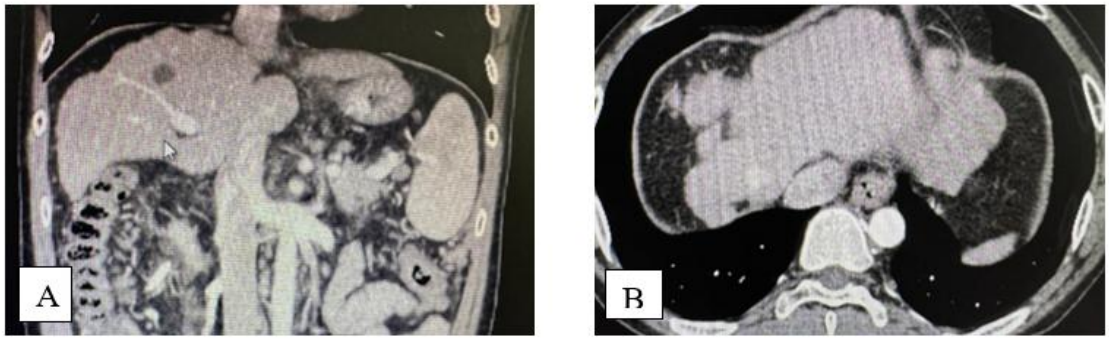
Below are cases of radiological control and process confirmation.

Pic. 1 - CT scan of the abdominal organs with contrast enhancement. Picture of metastatic lesions of the S VII-VIII segments of the liver.



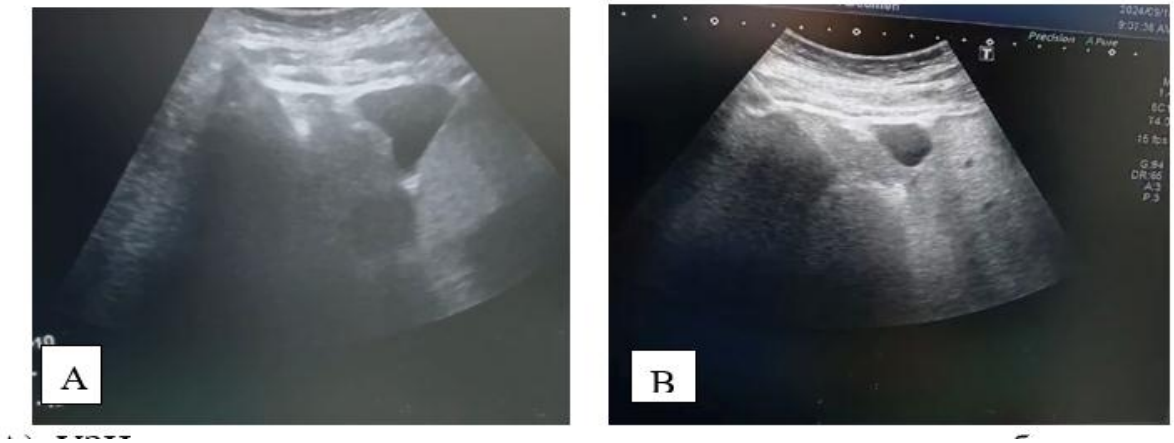
A) At the start of therapy. B) After applying RFA ablation (a granulation capsule with moderate edema of the capsule stroma is visible).

Pic. 2 - CT scan of the liver. Picture of hepatocellular carcinoma as a result of viral hepatitis "C" against the background of cirrhotic transformation of the liver of the S III segment of the liver.



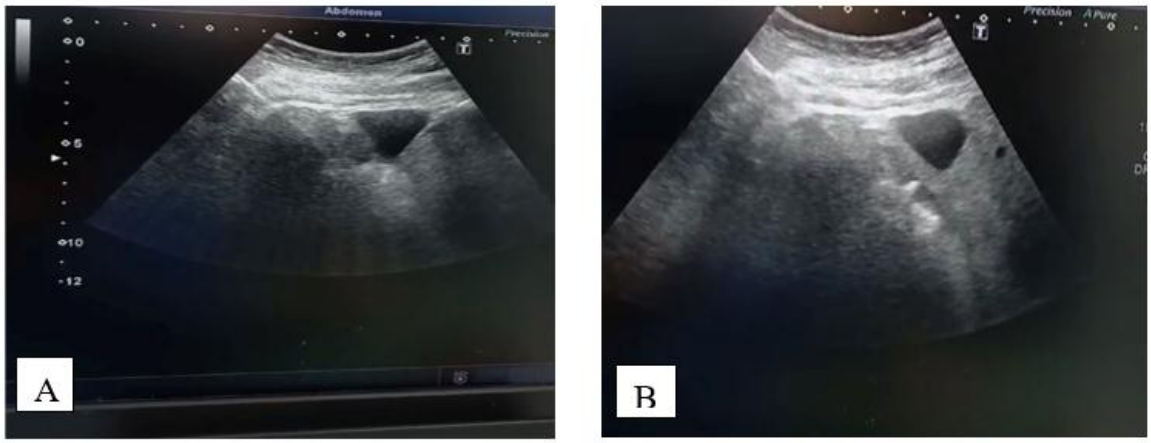
A) Picture before the start of therapy (coronal section). B) Picture after RFA ablation with the control area of sclerosis after 3 months (axial section).

Pic. 3 – Intraoperative ultrasound imaging of a patient with unresectable HCC with central disintegration.



A) Ultrasound picture of the immersion of a needle-electrode into a tumor formation of the liver. C) Immersion of the needle with ablation of the lesion with visualization of the tumor coagulation zone.

Pic. 4 - Intraoperative ultrasound visualization of a patient with unresectable HCC with a coagulation zone



A) Zone of complete coagulation. B) Coagulation zone of the "immersion channel" of the electrode. Final view after completion of RFA.

III. Conclusions:

Thus, radiofrequency ablation of solid tumors of parenchymal organs, in particular the liver parenchyma, in combination with chemotherapeutic therapy has a statistically significant effect on the tumor process and significantly increases relapse-free survival. It is not possible to track the median survival rate, because all 12 patients are in the process of special treatment and dynamic observation. The median overall survival exceeded 8 months of follow-up, and mPFS also exceeded the same follow-up period. Being a minimally invasive and highly effective technique, this method recommends itself with a low incidence of postoperative complications, minimal length of stay and days while maintaining a satisfactory quality of life.

Key words: radiofrequency ablation, hepatocellular carcinoma of the liver, chemotargeted therapy for metastatic solid lesions of the liver parenchyma.

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