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TRANSARTERIAL CHEMOEMBOLIZATION (TACE) IN THE TREATMENT OF HEPATOCELLULAR CARCINOMA OF THE LIVER - CASE REPORT

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ABSTRACT

Introduction: Hepatocellular carcinoma (HCC) is the most common primary malignant tumor of the liver, with significant mortality and limited therapeutic options in advanced stages of the disease. In patients who are not candidates for resection or ablative procedures, transarterial chemoembolization (TACE) has established itself as standard therapy.

Case report: We show a male patient, 69 years of age, diagnosed with an extensive right hepatic lobe tumor based on the CTA of the abdomen, unsuitable for surgical resection and thermal ablation. The TACE procedure using doxorubicin and embolization material was successfully performed in the catheterization laboratory (cath lab) of the Clinic of Radiology of KCUS, after which the control CTA showed a complete therapeutic response according to mRECIST criteria.

Discussion: The case presented confirms that TACE is an effective treatment modality in patients with intermediate HCC, even in those with large tumor lesions. A multidisciplinary approach, adequate patient selection and precise intervention technique are key success factors. This case further emphasizes the need to integrate the TACE procedure with modern systemic therapies, including immunotherapy and targeted drugs.

Conclusion: The TACE method has significant therapeutic potential in the treatment of HCC, and achieving a complete response in this case highlights the importance of an individualized approach and further research aimed at optimizing the procedure.

Keywords: hepatocellular carcinoma, TACE, transarterial chemoembolization, doxorubicin, mRECIST, interventional radiology

INTRODUCTION

Hepatocellular carcinoma (HCC) is the most common primary malignant tumor of the liver and is one of the leading causes of cancer death worldwide.[1] The incidence of HCC is on the rise, especially in countries with a high prevalence of chronic liver diseases, such as viral hepatitis B and C, as well as in patients with cirrhosis of various etiologies.[2] Despite the advances in diagnosis and therapy, HCC is in most cases diagnosed at an advanced stage, when curative methods such as resection or liver transplantation are no longer possible.[3] Transarterial haembolization (TACE) is a minimally invasive therapeutic method used in patients with unresectable hepatocellular carcinoma.[4] The procedure involves selective catheterization of the artery vascularizing the tumor, intra-arterial administration of a chemotherapeutic drug, and subsequent embolization of blood vessels with the aim of achieving maximum local cytostatic concentration and concomitant tumor tissue ischemia.[5] TACE is considered the standard of treatment for patients with intermediate stage HCC according to the Barcelona Clinic Liver Cancer (BCLC) classification, and shows a significant prolongation of survival compared to the best supportive care.[6] The application of the TACE method requires a multidisciplinary approach in which interventional radiologists, hepatologists and oncologists play a key role.[7]

Radiological technology enables accurate diagnosis, planning and performing the procedure with minimal invasiveness and maximum safety for the patient.[8] In recent years, significant advances in angiographic techniques, contrast agents and embolization materials have contributed to improving treatment outcomes and reducing complications.[9] Despite this, the success of TACE depends on the individual characteristics of the patient, the stage of the disease and the experience of the medical team, making each case report an important contribution to the evaluation and optimization of this therapeutic method.[10] Despite advances in systemic and local therapies, many patients with hepatocellular carcinoma (HCC) still do not have access to curative options such as resection or transplantation. In this context, case reports of transarterial chemoembolization (TACE) - especially in complex clinical situations - represent a valuable contribution to the refinement of the therapeutic approach and the development of standards. These displays can further illustrate how multidisciplinary teams - including radiologists, oncologists, and hepatologists - work together to make decisions that can optimize treatment outcomes for specific patients and context, such as working in a KCUS catheterization laboratory (cath lab).[3,1]

CASE REPORT

A male patient, 69 years old, was referred to the Radiology Clinic of the Clinical Center of the University of Sarajevo to assess the possibility of transarterial chemoembolization (TACE) due to extensive hepatocellular carcinoma of the liver. A previously performed abdominal CT scan in a private polyclinic indicated the presence of an extensive lesion in the right lobe of the liver, which was not suitable for resection due to the close relationship with venous structures, including the v. cava inferior, or for percutaneous thermal ablation due to size and localization. Based on the findings, the patient was not a candidate for classical surgical treatment, but was deemed suitable for the TACE procedure to be performed.

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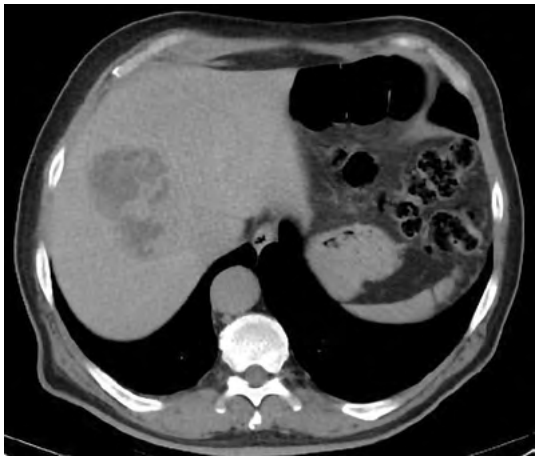

Figure no. 1. Axial CT scan of hepatocellular carcinoma of the liver prior to the TACE procedure

Under fluoroscopic guidance, the right femoral artery was punctured, and a 5 Fr introducer sheath was placed using the Seldinger technique. Sim 1 diagnostic catheter of 4 Fr was introduced, which cannulated the superior mesenteric artery, and then the right hepatic artery. Digital subtraction angiography (DSA) showed the feeding vessels of a tumor process localized in the subphrenic part of the right hepatic lobe. By selective catheterization of the aforementioned vessels with a Progreat microcatheter (2.4 Fr), a mixture of embolization material (DCB 100–300 μm) and 75 mg of doxorubicin was administered. Subsequent embolization was carried out using polyvinyl alcohol (PVA) particles with a diameter of 355–500 μm, until the appearance of reflux was observed. The puncture site was closed by manual compression, and the patient was recommended antibiotic prophylaxis and symptomatic therapy in case of development of postembolization syndrome.

A follow-up abdominal CT scan with angiography, performed one month after the procedure, showed a complete therapeutic response according to mRECIST criteria. There were no more signs of active tumor vascularization in the right hepatic lobe, nor signs of progression of the underlying disease. Based on these findings, the patient was recommended to consult a competent oncologist to decide on the possible continuation of systemic therapy, including chemotherapy or immunotherapy, with the aim of further monitoring and control of the primary disease.

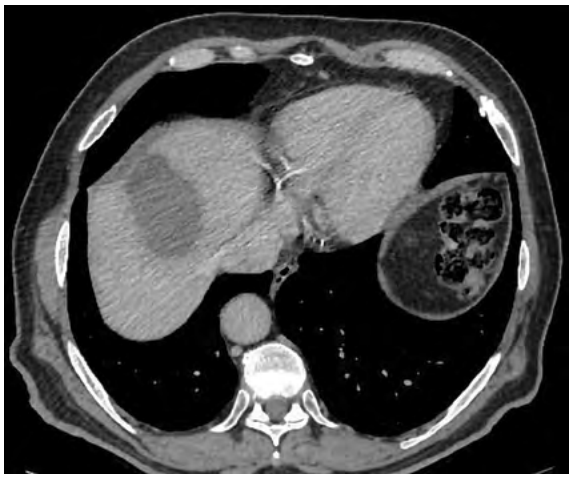

Figure no. 2. Axial CT scan of hepatocellular carcinoma of the liver after the completion of the TACE procedure

DISCUSSION

Transarterial chemoembolization (TACE) is the standard therapeutic option in patients with intermediate-stage hepatocellular carcinoma (HCC), according to the Barcelona Clinic Liver Cancer (BCLC) classification, and is clearly positioned in modern guides as a method of choice for patients who are not candidates for resection or liver transplantation.[6,12] Previous studies have shown that TACE significantly prolongs overall survival in carefully selected patients, especially when administered as part of an individualized therapeutic plan.[7,9]

In this case, a patient with a large tumor lesion in the right hepatic lobe, which due to its size and anatomical relationship to large blood vessels was not eligible for surgery or ablative methods, was successfully treated with TACE procedure. Selective catheterization of tumor feeders enabled targeted administration of chemotherapeutic drug and embolization material, resulting in a complete therapeutic response according to mRECIST criteria after only one procedure. This outcome is particularly significant because a complete response in intermediate HCC after initial TACE therapy is not common and usually requires multiple sessions.[13,15] Numerous studies confirm that the effectiveness of TACE largely depends on proper patient selection, the vascular anatomy of a tumor, and technical performance of the procedure itself.[8,10] In this regard, angiographic assessment of tumor vascularization, as well as the use of appropriate microparticles and cytostatic agents, play a key role in achieving optimal therapeutic effect.[11] Our review confirms the importance of a precise intervention technique, where the use of a combination of doxorubicin and PVA particles enabled permanent occlusion of tumor feeders with minimal risk for non-targeted damage to the surrounding parenchyma. Recent literature is increasingly highlighting the potential of combined therapeutic approaches, in particular the integration of TACE with systemic treatment, including immunotherapy and targeted therapies. The results of study LEAP-012 showed that the combination of TACE with lenvatinib and pembrolizumab can lead to a significant prolongation by progression of free survival compared to TACE by itself.[14] Such findings open up space for redefining therapeutic algorithms in intermediate HCC, and emphasize the need for a multidisciplinary approach in decision-making. An important aspect after performing TACE is the monitoring and prevention of post-embolization syndrome, which includes pain, fever, nausea and a general feeling of weakness. Timely symptomatic therapy and antibiotic prophylaxis, as in our case, are key to reducing the risk of complications.[17] Also, in patients who achieve a complete response, further therapeutic decisions should be made in cooperation with the oncologist, given the possibility of a later need for systemic treatment or liver transplantation.[16] Our case further confirms the importance of TACE in the treatment of patients with intermediate HCC, especially when it comes to large tumors that are not suitable for curative methods. The complete response in this patient emphasizes that adequate selection and careful execution of the procedure can result in an extremely favorable outcome, even in clinical situations that are initially considered unfavorable.

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CONCLUSION

The present case confirms that transarterial chemoembolization (TACE) is a safe and effective therapeutic modality in patients with intermediate hepatocellular carcinoma who are not candidates for surgical resection or ablative procedures. The complete therapeutic response achieved after the initial TACE procedure in this case further emphasizes the importance of careful patient selection, individualized approach and precise intervention technique. This paper contributes to the existing literature by highlighting the potential of the TACE method in achieving a complete response even in patients with large tumor lesions, and points to the importance of a multidisciplinary approach in planning further treatment. Integration of TACE with modern systemic therapies, including immunotherapy and targeted drugs, is a future direction of development and may further improve treatment outcomes in this complex group of patients.

From the perspective of scientific and clinical practice, our case highlights the need for further research in order to optimize the selection criteria and standardize the technical aspects of the TACE procedure. The introduction of new embolization materials, monitoring of response biomarkers and evaluation of combined therapeutic strategies could contribute to increasing the rate of complete response and long-term survival. This case report, while individual, reinforces the existing evidence and provides an additional argument in favour of a broader application of TACE in intermediate HCC.

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