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Imaging Predictors of Radiological Response and Tumor Necrosis in Patients with Hepatocellular Carcinoma undergoing Trans-arterial Chemoembolization

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- Congress Abstract
- Full Text

Purpose To evaluate the imaging and procedural factors affecting desirable radiologic and histopathologic response to trans-arterial chemoembolization (TACE) in patients with hepatocellular carcinoma (HCC).

Materials and Methods A total of 109 patients with HCC who had received super-selective TACE as the sole bridging therapy before liver transplantation between March 2002 and March 2017 were retrospectively studied. Index tumor parameters in pre-TACE multiphasic computed tomography (CT) or magnetic resonance (MR) images were evaluated to determine their correlation to radiological complete response as well as complete or near-complete tumor necrosis in histopathological analysis of liver after transplantation. TACE factors including bead size, doxorubicin dose, and administered volume were also studied with regards to treatment response in a subpopulation of patients receiving drug-eluting bead (DEB)-TACE once only for solitary tumors ($n = 25$).

Results Complete (100%) or complete/near-complete (≥90%) necrosis was achieved in 33% and 51% of the patients, respectively. In 61% of the cases, accurate correlation between radiological response to therapy and histopathological necrosis of tumor was observed. Post-TACE imaging displayed a sensitivity of 78% and specificity of 68% in identification of complete tumor necrosis. Necrosis over 90% was associated with typical enhancement (contrast enhancement during late hepatic arterial phase with washout) ($p = 0.0035$), smooth tumor margins ($p < 0.0001$), and arterial phase enhancement (with or without washout) in tumors with distinct margins ($p < 0.0001$). No significant correlation was found between tumor necrosis and tumor size, tumor number, unilobar or multilobar involvement, segmental spread, heterogeneous enhancement, (pseudo)capsule presence, and Child–Pugh classification. Seventy to 150 µm beads were observed to achieve a higher rate of radiological complete response (88%) versus 100 to 300 µm beads (46%); however, this difference was not statistically significant ($p = 0.074$). No meaningful correlation was observed between administered bead volume or doxorubicin dose and response to treatment.

Conclusion Pre-TACE HCC imaging factors including smooth margin, typical enhancement, and arterial enhancement in well-defined tumors can predict superior response to therapy. Complete response to therapy observed in post-TACE imaging may not reliably rule out tumor viability. Further studies are warranted to compare the effectiveness of certain DEB-TACE factors, such as various bead sizes and chemotherapeutic agent doses.

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No conflict of interest has been declared by the author(s).

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