

Avascular Transformation of Hepatocellular Carcinoma with Systemic Immunotherapy

Mithil Gudi BS¹, Alexander Eskandarian BS¹, Ali Yalcintepe MD^{1,2}, Karan T. Singh MD^{1,3}, Jeffrey Critchfield MD^{1,2,4}

Wayne State University School of Medicine¹, Detroit Medical Center², John. D Dingell VA Medical Center³, Karmanos Cancer Institute⁴

Background

- The combination of local embolization and immunotherapy for hepatocellular carcinoma (HCC) is an emerging approach.
- While atezolizumab and bevacizumab therapy is considered the gold standard, the STRIDE regimen, a dual immunotherapy therapy consisting of a priming dose of tremelimumab (anti-CTLA-4) with monthly durvalumab (anti-PD-L1), has grown in use.
- We present a unique case of a patient who was unintentionally initiated on STRIDE regimen between mapping angiography and embolization, which seemingly led to rapid avascular tumor transformation.

Case Summary

- A 74-year-old male with HCC, HFrEF w/ICD, HTN, CAD (s/p LAD stent) underwent mapping angiography, revealing hypervascularity of the target HCC from numerous vascular hepatic segmental, gastroepiploic, and inferior phrenic branches.
- Given the extensive vascular supply and high lung shunt fraction (12%), the plan shifted from Y-90 to transarterial chemoembolization (TACE) embolization with 300–500-micron drug-eluting doxorubicin beads.
- Repeat embolization angiography, performed 6 weeks later due to follow-up difficulties, showed substantially decreased tumor vascularity in the hepatic flexure branch of the gastroepiploic artery, inferior phrenic artery, and the segment 4 and 5 right hepatic artery branches.
- The inferior phrenic, hepatic segment 4, and hepatic segment 5 arteries were chemoembolized. Afterward, discussion with the patient's oncologist revealed that the STRIDE regimen had been initiated under the assumption that embolization had already occurred, with the last dose 7 days prior.

Case Images



Figure 1: Axial CT image of target hepatocellular carcinoma

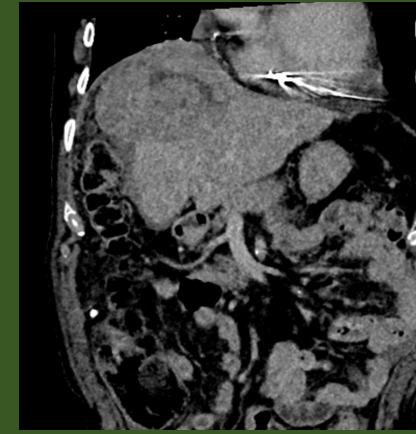


Figure 2: Coronal CT image of target hepatocellular carcinoma



Figure 3: a) DSA from celiac artery showing tumor mass and vasculature during mapping procedure; b) DSA run from celiac artery when patient returned for TACE embolization

Discussion

- The substantially decreased vascularity of the tumor compared to initial mapping is possibly attributed to the initiation of systemic treatment.
- The patient continued immunotherapy with complete mRECIST response was identified on 1 and 3 month imaging.
 - Unfortunately, the patient passed away 3 months later due to unrelated endocarditis and septic shock.
- The unanticipated reduction in HCC vascularity within a 6-week period is interesting given that the therapeutic mechanism of tremelimumab and durvalumab is not rooted in anti-angiogenic properties.
- Durvalumab, while not generally classified as a vesicant, is a platinum compound
 - Platinum compounds such as cisplatin and oxaliplatin are known to have some vesicant properties leading to tissue damage and microthrombosis
- The avascular transformation could also be attributed to a strong, local immune response due to the immune checkpoint inhibitor properties of the STRIDE regimen

Conclusion

- With the growing use of immunotherapy treatments, their impact on tumor vascularity and sequencing with local embolotherapy warrants further investigation.
- This finding highlights the importance of timing and communication among multidisciplinary teams in delivering oncologic care.

References

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