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Letters to the editor

Response to letter to the editor by Rodriguez S et al.



Dear Editor:

We are grateful to Rodríguez S et al. for their interest in our study. The findings of their research [1] and other studies we cited [2,3] reinforce the conclusion that routine bone scans for staging patients with hepatocellular carcinoma (HCC) are neither clinically indicated nor cost-effective, even in the context of patients with early-stage HCC undergoing evaluation for liver transplantation, as per the Barcelona Clinic Liver Cancer (BCLC) staging system.

At this point, we cannot specify any particular threshold beyond conventional criteria where the pre-test probability of extrahepatic spread would justify a bone scan. However, given the established association between the prevalence of bone metastases and disease stage [4,5], we believe further investigation is warranted. Notably, in our study, all patients with bone metastases had already been diagnosed with advanced disease [6].

Future studies could explore the utility of bone scans in patients with vascular invasion and/or extrahepatic spread (i.e., BCLC stage C) who demonstrate adequate responses to systemic therapy and are subsequently considered for liver transplantation [7]. Such an effort would require a multicenter research collaboration to achieve an adequate sample size.

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Declaration of interests

None

References

[1] Rodríguez S, Balbinotto Neto G, Kiss G, Brandão A, Liver Transplantation Group. Cost-effectiveness of whole-body bone scans in the pre-liver transplant assess-

- ment of patients with hepatocellular carcinoma in Southern Brazil. Clin Transplant 2016;30(4):399–406. https://doi.org/10.1111/ctr.12699.
- [2] Witjes CD, Verhoef C, Kwekkeboom DJ, Dwarkasing RS, de Man RA, Ijzermans JN. Is bone scintigraphy indicated in surgical work-up for hepatocellular carcinoma patients? J Surg Res 2013;181(2):256-61. https://doi.org/10.1016/j.iss.2012.07.013.
- [3] Koneru B, Teperman LW, Manzarbeitia C, Facciuto M, Cho K, Reich D, et al. A multicenter evaluation of utility of chest computed tomography and bone scans in liver transplant candidates with stages I and II hepatoma. Ann Surg 2005;241(4):622–8 PubMed PMID: 15798464; PubMed Central PMCID: PMC1357066. https://doi.org/10.1097/01.sla.0000157267.27356.80.
- [4] Guo X, Xu Y, Wang X, Lin F, Wu H, Duan J, et al. Advanced hepatocellular carcinoma with bone metastases: prevalence, associated factors, and survival estimation. Med Sci Monit 2019;25:1105–12 Epub 20190210PubMed PMID: 30739123; PubMed Central PMCID: PMC6378855. https://doi.org/10.12659/MSM.913470.
- [5] Kanda M, Tateishi R, Yoshida H, Sato T, Masuzaki R, Ohki T, et al. Extrahepatic metastasis of hepatocellular carcinoma: incidence and risk factors. Liver Int 2008;28(9):1256–63 Epub 20080715PubMed PMID: 18710423. https://doi.org/ 10.1111/j.1478-3231.2008.01864.x.
- [6] Rodriguez-Alvarez F, Mota-Ayala BZ, Villavicencio-Martínez R, Kauffman-Ortega E, Téllez-Morán LS, Castro-Narro G, et al. Limited utility of routine bone scintigraphy in the staging of patients with hepatocellular carcinoma: a cross-sectional study. Ann Hepatol 2024;29(6):101545. https://doi.org/10.1016/j.aohep.2024.101545.
- [7] Rezaee-Zavareh MS, Yeo YH, Wang T, Guo Z, Tabrizian P, Ward SC, et al. Impact of pre-transplant immune checkpoint inhibitor use on post-transplant outcomes in HCC: a systematic review and individual patient data meta-analysis. J Hepatol 2024 Jul 10:S0168-8278(24)02354-7. https://doi.org/10.1016/j.jhep.2024.06.042.

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