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Providing higher value care for hepatocellular carcinoma rather than diagnosis: What can current radiologists do?

Yao S *et al*. Medical imaging for HCC management

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Abstract

Medical imaging is of great value for the comprehensive evaluation of hepatocellular carcinoma from diagnosis to prognosis, which contributes to optimal clinical management making.

Core Tip: Medical imaging plays a vital role in the accurate diagnosis and grading of hepatocellular carcinoma as clinical treatment decision-making. Moreover, it is of powerful value for noninvasively preoperative evaluation of the treatment outcomes, prognosis, and survival with high sensitivity and repeatability. The comprehensive assessment involving preoperative, perioperative, and postoperative indicators for treatment option selection will assist surgeons precisely and maximize the benefits for patients.

TO THE EDITOR

In the current issue, we read with interest a retrospective study by Delvecchio et al[1], where liver resection (LR) and radiofrequency ablation (RFA) were evaluated as the treatment of choice for single hepatocellular carcinoma (HCC) (≤ 30 mm) located in posterosuperior segments (PSS) in elderly patients. Based on operative time, hospital stay, and short- and long-term outcomes, RFA was recommended as a suitable option.

The critical value of tumor size for LR or RFA differs in various criteria and guidelines, most of which is 20 mm. Single HCC with a tumor size of ≤ 30 mm was mainly targeted in this study. Locations with difficulties in surgery (PSS) and age (for the elderly ≥ 70 years old) were considered while making the treatment decision. It offered an insightful perspective and a specific focus, providing a supplement to this field with certain guiding significance for clinical management practice.

As described in the study, all subjects underwent computed tomography (CT) or magnetic resonance imaging (MRI) before treatment to access the tumor location and size, which are the two key points of this study. The diagnosis and stage of HCC were based on the European Association for the Study of the Liver criteria[2], which also regard medical imaging manifestations as a dominant support. Thus, medical imaging plays a vital role in the accurate diagnosis and qualitative evaluation of HCC. Along with morphological features, such as tumor location and size, satellite nodules, portal vein embolus, and invasion of adjacent tissues can be evaluated using CT or MRI, which are also of prognostic significance for patients with HCC after treatment.

Apart from the abovementioned perioperative and postoperative indicators for selecting treatment option, preoperative evaluation can be performed using noninvasive medical imaging with high sensitivity and repeatability. In a study by Cha et al[3], pretreatment imaging was utilized to compare the outcomes of RFA and LR for HCC ≤ 30 mm, and a high positive predictive value was achieved. Burgeoning functional imaging technologies, such as gadoxetic acid-enhanced MRI, IVIM, T1 mapping, have enabled insightful assessment of microvascular invasion, hepatocyte membrane function, hepatocyte density changes, tissue microcirculation, and liver reserve function. Meanwhile, artificial intelligence-imaging combining radiomics has

been empowering deep data mining of CT or MRI images of HCC from diagnosis to prognosis. In prior studies, we found that preoperative CT imaging combined with clinical features could predict the rate of liver regeneration after right hepatectomy for HCCs with an accuracy of 0.78 and an area under the curve (AUC) of 0.84[4]. Gadoxetic acid-enhanced MRI-derived features showed great potential for preoperative prediction of early recurrence of LR for HCCs, with the related model demonstrating a significant AUC of 0.841 (95%CI: 0.769-0.919)[5]. Taken together, medical imaging is closely related to optimal treatment decision-making and survival quality for patients. In future clinical practice, it is necessary to take full advantage of medical imaging to comprehensively evaluate tumor and liver conditions preoperatively as a treatment plan trade-off, so as to maximize the benefits for patients with HCC and meet the demands of precision medicine.

REFERENCES

1 **Delvecchio A**, Inchingolo R, Laforgia R, Ratti F, Gelli M, Anelli MF, Laurent A, Vitali G, Magistri P, Assirati G, Felli E, Wakabayashi T, Pessaux P, Piardi T, di Benedetto F, de'Angelis N, Briceño J, Rampoldi A, Adam R, Cherqui D, Aldrighetti LA, Memeo R. Liver resection vs radiofrequency ablation in single hepatocellular carcinoma of posterosuperior segments in elderly patients. *World J Gastrointest Surg* 2021; **13**: 1696-1707 [PMID: 35070074 DOI: 10.4240/wjgs.v13.i12.1696]

2 **European Association for the Study of the Liver. Electronic address: easloffice@easloffice.eu.; European Association for the Study of the Liver**. EASL Clinical Practice Guidelines: Management of hepatocellular carcinoma. *J Hepatol* 2018; **69**: 182-236 [PMID: 29628281 DOI: 10.1016/j.jhep.2018.03.019]

3 **Cha DI**, Song KD, Kang TW, Lee MW, Rhim H. Small masses (≤3 cm) diagnosed as hepatocellular carcinoma on pre-treatment imaging: comparison of therapeutic outcomes between hepatic resection and radiofrequency ablation. *Br J Radiol* 2020; **93**: 20190719 [PMID: 31670571 DOI: 10.1259/bjr.20190719]

4 **Zhang T**, Wei Y, He X, Yuan Y, Yuan F, Ye Z, Li X, Tang H, Song B. Prediction of Remnant Liver Regeneration after Right Hepatectomy in Patients with Hepatocellular Carcinoma Using Preoperative CT Texture Analysis and Clinical Features. *Contrast Media Mol Imaging* 2021; **2021**: 5572470 [PMID: 34220379 DOI: 10.1155/2021/5572470]

5 **Zhang Z**, Jiang H, Chen J, Wei Y, Cao L, Ye Z, Li X, Ma L, Song B. Hepatocellular carcinoma: radiomics nomogram on gadoxetic acid-enhanced MR imaging for early postoperative recurrence prediction. *Cancer Imaging* 2019; **19**: 22 [PMID: 31088553 DOI: 10.1186/s40644-019-0209-5]

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