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The Use Of 18F-FDG Positron Emission Tomography To Predict Tumour Recurrence In Hepatocellular Carcinoma Patients After Hepatectomy

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Background : A reliable biomarker to predict hepatocellular carcinoma (HCC) recurrence after hepatectomy is lacking. We hypothesized that pre-operative 18F-fluorodeoxyglucose (18F-FDG) uptake on positron emission tomography (PET) predicted HCC recurrence after hepatectomy.

Methods : This was a retrospective study of prospective collected data between 2004-2019. The cut-off for 18F-FDG uptake on PET for HCC recurrence was determined by Youdens' index. Patients were stratified into PET+ve and PET-ve group. Baseline, pathological characteristics, disease-free and overall survival rates were compared.

Results : 267 patients underwent hepatectomy with preoperative PET scan. The cut-off for 18F-FDG PET positivity was 1.526 (AUC=0.674, 95% CI 0.608-0.741, P⟨0.001). 155 patients were PET-ve and 112 patients were PET+ve. The PET+ve group had larger tumors (8.25 vs. 3.5cm, P⟨ 0.001), more microvascular invasion (67 vs. 36.1%, P⟨0.001), more poorly differentiated tumours (24.8 vs. 16.7%, P=0.03) and higher AFP≥100ng/ml (49.1 vs. 23.2% P⟨0.001). The time to recurrence was shorter in PET+ve patients (8.4 vs. 32.7 months, P⟨0.001) and there was more extrahepatic recurrence (8.9 vs. 2.6%, P⟨0.001). The PET-ve group had better overall and disease-free survival rates at 1-, 3- and 5-year respectively (96.1%, 84.9%, 79.8% vs. 78.2%, 54.9%, 43.1%, P⟨0.001; 74.6%, 55.2%, 45.8% vs. 43%, 37.1%, 33.1%, P⟨0.001)

Conclusions : PET+ve was associated with higher AFP and unfavourable tumour biology, with a higher risk of recurrence and inferior survival. 18F-FDG PET should be explored prospectively as a biomarker in HCC patients.

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