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EVALUATION OF CIRCULATING TUMOR DNA IN PORTAL VEIN BLOOD AS A BIOMARKER FOR EARLY RECURRENCE OF PANCREATIC CANCER

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Background : To determine the role of portal vein (PV) blood circulating tumor DNA (ctDNA) in predicting "occult" liver metastasis of pancreatic cancer and its potential advantages over peripheral blood.

Methods : Cell-free DNA was extracted from PV and peripheral blood plasma of patients with matched genomic tissue DNA who underwent curative-intent surgical resections for pancreatic cancer. 111 DNA Samples were then analyzed using commercialized panel DNA sequencing for 168 genes and targeted bisulfite sequencing.

Results : 111 DNA Samples of 37 patients were included for sequencing. Tissue DNA sequencing results of 37 patients showed that most patients had KRAS, CDKN2A, TP53, and SMAD4 mutations, and only two patients were KRAS wild-type. The detection of ctDNA mutations in peripheral blood and PV blood showed good consistency with the tissue detection results. It is worth noting that the mutation detection rate of PV blood ctDNA was significantly higher than that of peripheral blood (25/37 VS 17/37). The methylation block score (MBS) results showed that the MBS of portal blood ctDNA were significantly higher than those of peripheral blood. Mutations detected in PV blood were significantly associated with recurrence. We further analyzed the fragment characteristics of PV blood and peripheral blood cfDNA. The results showed that there was no significant difference in the total amount and concentration of DNA between the two groups, but in the fragment distribution. Portal vein blood cfDNA is more distributed in longer DNA fragments, which may be the reason for its higher detection sensitivity.

Conclusions : PV blood ctDNA has certain advantages in mutation and methylation detection compared to peripheral blood. It is feasible to utilize PV blood ctDNA to predict early recurrence for pancreatic cancer patients.

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