

P025

Application of three-dimensional visualization, VR technology combined with ICG molecular fluorescence in hepatectomy under non-vascular occlusion for centrally located hepatocellular carcinoma

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Introduction : To explore the application value of three-dimensional visualization, VR technology combined with ICG molecular fluorescence in hepatectomy under non-vascular occlusion for centrally located hepatocellular carcinoma.

Methods : Clinical data of one patient with centrally located hepatocellular carcinoma undergoing mesohepatectomy in the Department of Hepatobiliary, Zhujiang Hospital Affiliated to Southern Medical University in July 2018 were retrospectively analyzed. Three-dimensional visualization and VR technology were adopted and intraoperative use of FIGFI was combined with hepatectomy under non-vascular occlusion.

Results : According to the three-dimensional visualization, the volume of the whole liver, the tumor, the pre-resected liver and the residual liver was 1423.54ml, 405.35ml, 524.48ml and 899.06ml respectively. The residual liver volume accounts for 63.15% of the standard liver volume. The tumor was about 11.1*11.5*8.54cm. VR model showed that the tumor was located in segments VI, V and VIII. Three-dimensional visualization with blood vessels as the axis was classified as 3-class, IIb-type. The centrally located hepatocellular carcinoma was classified as type III, which was to be treated by mesohepatectomy. Mesohepatectomy under non-vascular occlusion was performed during operation. The preoperative 3D visualization and VR model were consistent with the intraoperative findings, and the preoperative planning was consistent with the actual operation. There were no obvious postoperative complications.

Conclusions : Three-dimensional visualization and VR technique combined with ICG molecular fluorescence can assist hepatectomy under non-vascular occlusion for centrally located hepatocellular carcinoma.

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