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Impact of Three-dimensional (3D) Visualization on Laparoscopic Hepatectomy for Hepatocellular Carcinoma

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Introduction : To assess the impact of 3D visualization on laparoscopic hepatectomy for hepatocellular carcinoma.

Methods : A retrospective review with propensity-score matched analysis of 3D and 2D laparoscopic hepatectomy performed in a tertiary hepatobiliary surgery centre.

Results : Since 3D laparoscopy was available, the proportion of laparoscopic major hepatectomy has significantly expanded (1.7% vs. 24.0%, p<0.0001). The percentage of difficult resection among laparoscopic hepatectomy also increased (12.6% vs. 40.0%, p=0.0001). A total of 305 patients (3D group: 92 patients; 2D group: 213 patients) underwent laparoscopic hepatectomy between 2002 and 2019. The 3D group had better liver function, larger tumours at more difficult locations, more major resections, and more difficult surgeries. After propensity score matching 144 patients were analysed (3D group: 72 patients; 2D group: 72 patients). They were comparable in terms of liver status, tumour status and complexity of liver surgery. The operative time (218 vs. 218 mins, p=0.50) and blood loss (0.2 vs. 0.2L, p=0.49) were comparable between two groups. Overall complications were higher in 2D group (1.4 vs. 11.1%, p=0.03). Patients who underwent 3D laparoscopic major hepatectomy had a shorter hospital stay than their comparable counterparts operated through an open approach (7 vs. 6 days, p=0.003).

Conclusions : 3D visualization enhanced feasibility to laparoscopic major hepatectomy and difficult laparoscopic liver resection. 3D resection was potentially associated with fewer operative morbidities. 3D laparoscopic approach did not jeopardize the outcome of major hepatectomy.

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