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What are operating-time-determining factors of pure laparoscopic donor hepatectomy for adult recipients?

Akira Umemura¹, Hiroyuki Nitta¹, Hirokatsu Katagiri¹, Shoji Kanno¹, Koji Kikuchi¹, Daiki Takeda¹, Taro Ando¹, Satoshi Amano¹, Akira Sasaki¹

¹Department of Surgery, Iwate Medical University, Japan

Introduction: A few studies on pure laparoscopic donor hepatectomy (PLDH) have been reported. However, PLDH demands high technique and experience on laparoscopic liver resection (LLR). In this report, we aimed to confirm operating-time-determining factors of PLDH and the learning curve of PLDH.**Methods:** We enrolled 48 donors underwent PLDH for adult recipients at Iwate Medical University Hospital. We extract operating-time-determining factors by multivariate analysis of donor characteristics, then, the learning curve was evaluated using the CUSUM and RA-CUSUM methods.**Results:** We chose left lobe graft in 18 donors and right lobe in 30 donors. The mean operating time and blood loss were 393.6 ± 80.3 minutes and 192.4 mL, respectively. We converted to laparotomy in three cases (6.3%). A multivariate analysis revealed that the factors of BMI 23 kg/m^2 (odds ratio: 5.000, 95 % confident interval: 1.056-23.675, $P = 0.042$) and intraoperative direct cholangiography (odds ratio: 5.000, 95 % confident interval: 1.120-22.321, $P = 0.035$), were associated with a significantly higher risk of longer operating time. The learning curve was first assessed using the CUSUM method, and the CUSUM graph showed two peaks, at the 13th and 27th case. The peaks of the curvature indicate the point at which a surgeons surgical competence advances from one phase to another, overcoming the learning curve. Based on these results, an RA-CUSUM analysis was performed to assess the learning curve, which showed a decrease in the learning curve after 33 to 34 PLDH procedures.**Conclusions:** Body mass index and requirement of intraoperative direct cholangiography were operating-time-determining factors; however, graft type and anatomical anomaly were not affecting factors of PLDH difficulty. When expert surgeons deeply involved in LLR perform PLDH, A learning curve effect is demonstrated after over 30 PLDH procedures in this study.