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Comparison Of Surgical Outcomes And Learning Curve For Robotic Versus Laparoscopic Living Donor Hepatectomy: A Retrospective Cohort Study

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Background : Both laparoscopic living donor right hemihepatectomy (LLDRH) and robotic living donor right hemihepatectomy (RLDRH) have been developed for minimally invasive donor hepatectomy (MIDH), although comparative analysis between the two surgical modalities is lacking. This study aims to compare surgical outcomes of LLDRH and RLDRH at a single institution.

Methods : From March 2016 to March 2022, 171 patients who underwent MILH of right liver were enrolled and divided into RLDRH and LLDRH. Two surgeons with experience in both techniques performed all procedures. Clinical characteristics, perioperative outcomes of donor and recipient, and donor anatomic variations were compared between both groups, and learning curves were estimated. Subgroup analysis was also performed, including only donors recruited after 2019, when LLDRH was initiated at our institution.

Results : RLDRH and LLDRH were performed for 102 and 69 patients, respectively. Operative time was significantly longer for RLDRH than LLDRH (464 vs. 407 min, P<0.001), although estimated blood loss was lower in RLDRH (104 vs. 238 mL, P=0.002). Incidence of major complications was similar in both groups. After 2019, significantly more RLDRH vs. LLDRH patients had variation in the hepatic artery (14.3% vs. 2.9%, P=0.020) and portal vein (16.1% vs. 4.3%, P=0.027). Learning curve for RLDRH was stabilized after approximately the 16th case, whereas that of LLDRH stabilized immediately.

Conclusions : RLDRH resulted in less intraoperative bleeding and comparable postoperative outcomes than LLDRH. Moreover, since 2019, RLDRH has been employed more frequently for donors with hilar structure anatomic variations. Based on our single-center experience, we propose that standardized procedures for RLDRH might help set up pure minimally invasive procedures for donor hepatectomy and facilitate safe implementation of laparoscopic approaches.

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