



Can laparoscopic liver resection for colorectal liver metastases provide early initiation of adjuvant chemotherapy?

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The long-term outcome of patients with colorectal liver metastases (CRLM) has improved because of advances in surgical technique and perioperative chemotherapy (1-3). Liver resection followed by adjuvant chemotherapy (AC) provides better recurrence-free survival in patients with CRLM than surgery alone (4,5).

Laparoscopic liver resection (LLR) has become a standard procedure worldwide for CRLM (6,7). LLR for CRLM has some advantages compared with conventional open liver resection (OLR). Several studies using propensity score matching (PSM) and one meta-analysis of PSM studies have demonstrated comparable results in patients having LLR compared with patients having OLR, including longer or similar operative times, reduced intraoperative blood loss, less need for transfusion, similar surgical margins, shorter hospital stays, lower or equal morbidity, and equivalent mortality (8-11). From an oncological perspective, LLR can result in a similar long-term outcome without any specialized recurrence pattern. Furthermore, the results of the OSLO-COMET randomized controlled trial (RCT) have provided solid evidence that LLR for patients with CRLM is safer, less invasive, and cost effective (12,13).

We congratulate Dr. Kawai and colleagues for publishing “*Laparoscopic liver resection for colorectal liver metastasis patients allows patients to start adjuvant chemotherapy without delay: a propensity score analysis*” in *Surgical Endoscopy* (14). Several studies have demonstrated that AC is beneficial for stage III colorectal cancer (15,16), and it should be started within

8 weeks postoperatively to prevent tumor relapse and metastasis (17,18).

Two papers have focused on the impact of LLR on the timing of postoperative AC in patients with CRLM (19,20); however, these studies could not rule out the influence of confounding background factors between LLR and OLR patients. Furthermore, both studies have shown higher complication rates in LLR than in OLR, which strongly influenced the timing of postoperative AC. Another study demonstrated that a delay in AC initiation could be associated with worse overall and recurrence-free survival (21).

In the current paper, the authors performed a one to two PSM analysis to decrease the influence of confounding factors in LLR and OLR groups (14). After PSM, all clinicopathological findings were well balanced between 22 LLR patients and 44 OLR patients. Finally, after LLR, all patients were administered postoperative AC within 8 weeks. In contrast, 34% of OLR patients had delayed postoperative AC initiation. This study showed a significantly shorter interval between LLR and AC initiation than OLR (43 ± 11 vs. 53 ± 18 days, $P=0.011$), despite comparable postoperative complications and hospital stays. The authors asserted that the diminished surgical trauma in LLR could shorten postoperative recovery, allowing patients to begin with postoperative AC within the optimal timeframe.

It is difficult to determine why LLR can shorten the interval between surgery and AC initiation. The

complication rates were similar in both Clavien–Dindo grades I–II and III–IV (22), and reoperation was never encountered. Postoperative stay was 1 day shorter in LLR, but the difference was not significant. Simultaneous resection of primary colorectal cancer could delay AC initiation; however, this was not addressed in the report. In addition, the preference of the surgeon in determining AC initiation is important, and similarities between surgeons performing LLR and OLR should be clarified.

One previous paper showed better health-related quality of life (HRQOL) assessed with the 36-item Medical Outcomes Study Short Form (SF-36) test in LLR compared to OLR within a year after surgery (23). In a recent RCT, HRQOL was similarly determined using SF-36 test 1 month after surgery (12). Mean values were significantly different: 0.713 and 0.665 in LLR and OLR, respectively. The frequency of postoperative scar discomfort or stiffness was significantly lower in the assisted LLR group than in the OLR group (2.6% *vs.* 31.2%; $P < 0.001$) (24). Better HRQOL and less subjective symptoms immediately after LLR could influence a timing of AC initiation.

Very recently, a meta-analysis of PSM studies demonstrated a better 3-year overall survival of patients with CRLM who underwent LLR than those who underwent OLR (11). To keep the duration of liver resection and the AC start within 8 weeks might be essential to achieve excellent long-term prognosis. Further prospective large-size studies will be required.

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