Editorial Commentary

Is there a difference in postoperative outcomes and quality of life between a laparoscopic and open approach for hepatic hemangioma resection?

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Utilization of minimally-invasive liver resection has increased in recent years. As such, we read with great interest the study by Liu *et al.* entitled "*Surgical outcomes and quality of life between laparoscopic and open approach for hepatic hemangioma: a propensity score matching analysis*". In this study, the authors compared postoperative clinical outcomes and quality of life (QOL) between patients who underwent a laparoscopic versus open approach among patients undergoing hepatic resection for hemangioma (1). The authors used propensity score-matching techniques to attempt to create a balanced comparison of treatment groups and to help control for potential selection bias. Following propensity score matching, a laparoscopic approach was associated with less blood loss (200 *vs.* 300 mL, P=0.044), shorter postoperative hospital stays (4.0 *vs.* 6.0 days, P<0.001), and lower rates of overall complications (4.1% *vs.* 19.2%, P=0.005) versus an open approach. Interestingly, the authors noted no difference in most QOL short form-36 domains, although patients who underwent laparoscopic surgery reported less pain (P=0.033) and improved emotional health (P=0.047) scores at 3 months after surgery. Based on these findings, the authors concluded that a laparoscopic approach was associated with improved short-term surgical outcomes and comparable QOL versus an open approach.

While there were no randomized controlled trials published on the laparoscopic versus open approach to hepatectomy at the time of the study period, the recent OSLO-COMET randomized controlled trial comparing laparoscopic versus open resection for colorectal liver metastases was published in 2018 (2). In this study, Fretland *et al.* reported similar improvements in outcomes with a laparoscopic approach being associated with fewer complications (19% *vs.* 31%, P=0.021), a shorter postoperative hospital stay (53 *vs.* 96 hours, P<0.001), as well as a lower median dose of postoperative morphine equivalents (52 *vs.* 170, P<0.001) versus an open operation. While there was no difference in overall healthcare costs, health-related QOL was higher at both 1 month (P=0.001) and 4 months (P=0.008) following surgery among patients who underwent a laparoscopic approach; in turn, there was a 67% probability that laparoscopic hepatectomy was more cost-effective compared to an open approach. Furthermore, a follow-up study noted improved long-term health-related QOL after laparoscopic surgery (3).

We commend the authors for including QOL as an outcome in the current study, as there are limited data on patient-reported outcomes after laparoscopic liver resection. The study group, which included only patients with hepatic hemangiomas, allows for a more direct evaluation of the surgical approach without other confounding factors such as cancer-related treatments. The inability of the current study

to find differences in QOL based on operative approach could be related to several reasons. While the authors compared domain scores from the short form-36 between the open and laparoscopic groups preoperatively and at 1- and 3-month postoperatively, scores within each group (how QOL changed from before surgery to 1 to 3 months after surgery within the laparoscopic and open groups) were not compared. With regards to operative approach, potential variation in "same person" differences from baseline QOL may be more revealing than comparing absolute, aggregate postoperative short form-36 scores. A linear mixed model, similar to that employed by the authors of the OSLO-COMET study, would have been a more nuanced methodology to investigate within-group differences at several time points. Additionally, all patients included in the study by Liu *et al.* had pain or complications from enlarging hemangiomas preoperatively, which may have influenced their perception of surgical pain and overall health postoperatively. Furthermore, as the authors did not report the number of patients from each group who returned the short form-36 health survey, there may be underlying participation bias. Despite this, postoperative clinical outcomes (blood loss, complications, hospital length of stay) remained superior compared with patients undergoing an open resection. As such, the results from both this study, as well as the data from the OSLO-COMET trial, add to the growing literature in support of a minimally-invasive approach for liver resection.

There is a well-established learning curve when adopting a laparoscopic approach to liver resection and surgeons must be cautious when implementing this technology in their practice. Furthermore, surgeons must be aware and prepared for conversions to open, as unplanned conversions may result in worse outcomes as compared to standard operations (4). Given the current data, we support the gradual implementation of a minimally-invasive surgical approach for hepatectomy based on the Louisville, Morioka, and Southampton consensus statements (5-7). We commend the authors for providing further evidence to a growing body of literature supporting a laparoscopic approach for hepatic resection.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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