



# Survival after laparoscopic versus open resection for colorectal liver metastases

Davit L. Aghayan<sup>1,2,3^</sup>, Åsmund Avdem Fretland<sup>1,4</sup>, Bjørn Edwin<sup>1,2,4</sup>

<sup>1</sup>The Intervention Centre, Oslo University Hospital - Rikshospitalet, Oslo, Norway; <sup>2</sup>Institute of Clinical Medicine, Medical Faculty, University of Oslo, Oslo, Norway; <sup>3</sup>Department of Surgery N1, Yerevan State Medical University after M. Heratsi, Yerevan, Armenia; <sup>4</sup>Department of HPB Surgery, Oslo University Hospital - Rikshospitalet, Oslo, Norway

Correspondence to: Davit L. Aghayan, MD. The Intervention Centre, Oslo University Hospital - Rikshospitalet, Oslo, Norway.

Email: dr.aghayan@gmail.com.

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Laparoscopic liver surgery has become standard of care in many specialized centers worldwide (1,2). Despite its well-known advantages over open approach in surgical outcomes, the evidence supporting its advantages in long-term oncologic outcomes is limited.

We read with interest the recent meta-analysis by Nicholas L. Syn and colleagues, where they assessed the long-term oncologic outcomes of laparoscopic and open liver surgery for patients with colorectal cancer liver metastases (CRLM) (3). The meta-analysis includes 13 propensity-score matched studies and 2 randomized controlled trials with a total of 3,148 patients [laparoscopic (n=1,275), open (n=1,873)], and the authors report a survival benefit in favor of laparoscopic surgery. In two-stage meta-analysis including all studies the pooled hazard ratio was 0.87 (95% CI: 0.77–0.99, P=0.03). The authors concluded that the results of this meta-analysis demonstrated that laparoscopic liver surgery is at least not inferior to the standard open approach.

Most of the studies included in this meta-analysis were primarily aimed to investigate differences in surgical outcomes. Among 13 propensity score matched studies, only one study (4) used clinical risk score (5) as a covariate to achieve propensity score matching. Beppu *et al.* (6) used 5 variables from the clinical risk score in their propensity score matching, while four studies used 4 variables. The

rest 7 studies included only 1 to 3 oncologically relevant variables in the matching process.

The 2 randomized trials included in the meta-analysis had postoperative complications as primary endpoint, while long-term oncologic outcomes were defined as secondary endpoints (7,8). These randomized trials were not designed to detect differences in survival rates.

Finally, this meta-analysis is an enhanced secondary analysis of survival data reconstructed from published Kaplan-Meier survival curves. This method was described by Guyot and colleagues in 2012 (9). They noted in their publication that this method is not quite the same as true individual patient data and has several limitations. The method was developed to for the analysis of large amount of RCTs reporting Kaplan-Meier curves. As one can observe, the current meta-analysis includes only 2 RCTs. Moreover, Guyot *et al.* noted that together with Kaplan-Meier curves, time-to-event outcomes, information on numbers at risk and total number of events are crucial when using this method, and if not provided, the algorithm may produce poor results. We found that not all studies in the current meta-analysis report this information. These shortcomings should be considered when interpreting the outcomes of the current meta-analysis.

We might conclude that this meta-analysis is well

<sup>^</sup> ORCID: 0000-0001-7051-3512.

performed with advanced statistical analyses, and that it as such, improves the evidence-level of the current literature. However, most of the studies included, were not designed to detect survival differences. Our group has since 1998 been strong proponents for laparoscopic liver surgery. Considering the limitations of the included studies, we are reluctant to draw strong conclusions from the current meta-analysis with regards to oncologic outcomes. The body of evidence on laparoscopic liver resections should now be enriched by multicentre randomized trials and analyses of multicentre, multinational registries.

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