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EDITORIAL – THORACIC ONCOLOGY

Unlocking Better Survival for Esophageal Cancer Patients: Is Thoracic Duct Resection the Key?

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Esophagectomy plays a distinct role in a multimodality treatment plan for esophageal squamous cell carcinoma (ESCC). However, whether and how a standard procedure should be defined to increase anatomic feasibility and enhance the control of local recurrence and distal metastasis are still subject to debate. Uniquely, ESCC lymph node metastasis occurs both vertically (proximal esophagus drains through recurrent laryngeal nodes to supraclavicular nodes, and the distal esophagus drains into paracardial nodes) and horizontally (para-esophageal lymph node metastasis in the middle and lower mediastinum).[1] Therefore, resection of the thoracic duct (TD) used to be a critical procedure in certain medical centers to achieve a more complete mediastinal lymph node dissection. However, this procedure has become infrequently applied given the concerns of perioperative complications and the wide use of minimally invasive surgical approaches. More importantly, there has been limited knowledge to show whether TD resection can provide a definitive benefit to improve patients' long-term outcomes.

In this issue of the *Annals of Surgical Oncology*, Tanaka and colleagues[2] present a retrospective, multiinstitutional analysis in which they compare the outcome of patients receiving esophagectomy with and without TD resection. Employing in their work a total of 2269 patients and propensity score analysis, the authors concluded that TD resection is associated with both reduced hematogenous and local recurrence in patients with more advanced esophageal squamous cell carcinoma, and thus leads to an improved clinical outcome. Their results flip the observation from several smaller-scale retrospective studies suggesting that TD resection has minimal or even a negative impact on the prognosis of ESCC patients.[3–7] Altogether, the current study provides a fundamental basis for the argument of prophylactic TD resection or ligation in ESCC surgery. Nonetheless, several points should be considered when interpreting these results.

Firstly, although this study is strengthened by multiinstitutional data and propensity scoring analysis, it is still limited by intrinsic bias as in other retrospective studies. For instance, the current study includes ESCC surgery records within two decades, whereas the year of surgery (2000–2009 vs. 2010–2017, $p = 0.0004$) seems to have an even pronounced impact on overall survival compared with TD resection ($p = 0.0032$) itself.

Secondly, two of our prospective randomized clinical trials[8–10] proved that complete lymph node dissection is critical for improving ESCC patient survival. However, "more-than-necessary" lymph node dissection cannot further potentiate patients' benefit, either.[10] Intriguingly, the current study shows that more mediastinal lymph node dissection is achieved in TD resected patients (26 vs. 24, $p < 0.0001$), which likely contributes to the improved overall survival in this subgroup of patients. Besides this hypothesized benefit, however, this study lacks a systematic review of perioperative complications associated with TD resection, which is another key measurement to evaluate the value of TD resection in ESCC.

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Thirdly, in addition to improved mediastinal lymph node dissection, the authors indicate that TD resection may also decrease hematogenous metastasis (less liver metastasis in TD resected group, $p < 0.05$). Although this is an intriguing clinical observation, it must be determined biologically what the role of TD is in the hematogenous metastasis of ESCC. Furthermore, if TD is indeed crucial in this process (e.g., as the route for cancer cells entering systemic circulation), can TD ligation, instead of resection, achieve the same therapeutic effect?

Inspired by this study, other interesting questions also remain to be answered. For instance, with the increasing use of neoadjuvant radiation therapy, chemotherapy, and immunotherapy, what is the role of TD resection in these patients, and how can candidates for TD resection be appropriately selected? Overall, Tanaka and colleagues should be congratulated for a large-scale and in-depth investigation of the value of TD resection for ESCC patients. Keeping these strengths and limitations in mind can aid readers in understanding the study and considering whether the results apply to their practice.

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