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Can surgical technology better guide oncological resections in colon cancer?

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Dear Editor,

There is little debate that the lymph node yield is an important marker of quality and prognosis in colon cancer and that procuring a minimum of 12 is an acceptable standard of care, and that decreased survival is associated with <12 nodes being obtained. (1). The value of obtaining *more* than 12 nodes or optimal absolute node is contentious. Recently, Del Paggio et al evaluated the association of lymph node yield with nodal positivity and cancer-specific survival after curative resection for stages II/III colon cancer, concluding that thresholds for optimal survival are associated with yields greater than 12(2). However, the authors and other studies have shown the number of nodes examined above 12 does not associate with staging, use of adjuvant therapy, or significant survival benefit in colon cancer(3). So why strive for more nodes?

The number of nodes examined depends on many variables, including the surgeon's technique of lymphadenectomy and the pathologist's meticulous dissection with specimen. It is reasonable to suggest that the extent of resection should be based on anatomical and embryological landmarks, not the premise of getting more nodes. This concept is illustrated by the "en bloc" total mesorectal excision (TME) in rectal cancer(4). The concept of Complete Mesocolic Excision (CME) with Central Vascular Ligation in colon cancer is meant to be analogous to the TME but the concepts are not directly transferable. While some evidence suggests CME is associated withimproved survival outcomes, it is debatable whether this is related to an increased number of nodes. (6). AS such, considering the the increased morbidity with increased nodal yield, , there is insufficient evidence to recommend its' widespread adoption.

Perhaps the right answer is to perform a more accurate dissection, not just procure more nodes. Techniques to improve nodal assessment and supplement pathological staging, such as radioimmunoguided surgery (RIGS) and sentinel lymph node (SNL) mapping have been described although their their role remains poorly defined. . The most meaningful tool for guiding the optimal resection margins may be intra-operative fluorescence imaging (FI) with a fluorophore, such as indocyanine green (ICG). FI allows direct visualization of the tumor with its draining nodal basin, the sentinel node(s), and any aberrant nodes outside of the planned resection field, thus permitting a more precise mesenteric lymphadenectomy, obviating a reliance on lymph node numbers alone.. FI can also show the watershed areas in the mesentery and define the lateral extents of lymphatic spread, allowing a CME-style dissection to be completed. This type of lymphatic mapping may permit improved intraoperative cancer-targeting techniques.

The clinical implications for this precision-guided surgery could impact staging, patient prognosis, and guide adjuvant therapy recommendations the way simply harvesting more nodes could not. Studies are underway to validate these clinical assumptions with FI, and technical details are being standardized. In the meantime, ensuring pathological scrutiny of our surgery, we must continue to strive for optimal resections based on oncological principles to obtain a minimum of 12 nodes for our patients the best outcomes.

Keywords: Colon cancer; complete mesocolic excision; central vascular ligation; lymph node yield; fluorescence lymphangiography; fluorescence imaging; indocyanine green

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