EDITORIAL

Adequate distal resection margin in rectal cancer surgery

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Heald et al.[1,2] popularized the concept of total mesorectal excision (TME) as a curative surgical treatment for rectal cancer. The recommendation is based on their findings of a possible more extensive distal tumor spread in the mesorectum (up to 5 cm) than that occurring in the rectal wall (intramural spread), which rarely exceeds 1 cm and only occurs in approximately 5% of TME specimens.[3-5]

The distal resection margin is defined as the distance from the lowest point of cancer extension (intramural or mesorectal) to the edge of the distal section of the surgical specimen. This margin is of great importance in deciding whether sphincter-sparing surgery is feasible. In the pre-TME era, a distal margin of at least 5 cm was mandatory. With TME surgery, the 5-cm rule has been abandoned for low rectal tumors and a margin of at least 2 cm is considered oncologically sufficient in patients with TME who do not receive neoadjuvant chemoradiotherapy (CRT).[6] In low rectal cancer there may be only 1 or 2 cm of mesorectum distal to the tumor, therefore distal mesorectal spread (DMS) cannot extend beyond 2 cm by definition.

New studies have shown excellent oncological results in terms of local recurrence and 5-year survival, even with a distal resection margin ≤ 1 cm after TME and preoperative CRT, which are no different from those obtained with a margin > 1 cm.[7,8] It should be noted that in TME surgery, no residual mesorectum is left in situ.

However, removal of the entire mesorectum is not necessary for upper rectal cancer, which can be adequately treated oncologically by partial mesorectal excision (PME), with a 5 cm margin distal to the lower edge of the tumor.[9-11] PME is a less complex procedure associated with lower morbidity and better short- and long-term functional outcomes.[12]

It is important to achieve an adequate distal resection margin of both the rectal wall and the mesorectum, due to the possible presence of DMS that may present as metastatic lymph nodes, lymphovascular or perineural invasion, or tumor deposits.

It is necessary to know the prevalence and extent of DMS in order to define an oncologically safe distal resection margin, in which case it is preferable to preserve as much of the rectum and its mesorectum as possible to obtain better functional results.[13,14] It should be kept in mind that DMS could potentially be greater than that reported in the literature, since most studies analyze fixed resection specimens and the length of the distal resection margin can be reduced by up to 30% after fixation.[15]

Currently, there is no consensus on when to perform a formal TME up to the puborectalis muscle, or a PME leaving a longer rectal stump with its mesorectum and still with an adequate distal margin. For high rectal tumors, the NCCN guidelines[16] propose a distal mesorectal resection margin of 4-5 cm and the ESMO guidelines[17] propose 5 cm.

Tailoring the distal margin to tumor stage and neoadjuvant treatment has the potential to increase tumor-free distal mesorectal margins and potentially improve functional outcomes.

Neoadjuvant CRT has been shown to decrease the number of positive lymph nodes available for pathologic evaluation.[18,19] A Dutch study showed that in patients with positive nodes and a distal margin ≤ 2 cm, TME with radiotherapy was associated with lower recurrence rates than

TME without radiotherapy, suggesting that for node-negative patients TME with a distal margin of 1 cm is sufficient and for node-positive patients TME with a margin of more than 2 cm is required.[20]

To provide data to help reach a consensus on the distal resection margin in patients with rectal cancer undergoing PME, Grutter et al.[21] performed a systematic review to study the presence and distal spread of tumor cells in the mesorectum. Of 22 studies with a total of 1921 patients, the presence of DMS was reported in 207 (10.8%) (1.2% in the neoadjuvant CRT group, and 12.8% in the non-CRT group). Only 84 (40.6%) patients had histopathology reports showing the greatest distance from the DMS to the tumor, which averaged 20.2 mm. The maximum DMS was 50 mm, although in less than 1% of cases.

DMS increased with higher T stage. In subgroup analysis, for T3, the median DMS distance was 18.8 mm (range 8–40 mm) and for T4 27.2 mm (range 10–40 mm). According to this study, distal resection margins of 4 cm and 3 cm would result in 10% and 32% residual tumor, respectively.

In summary, this review study shows that DMS can occur in a proportion of patients (11%) beyond 2 cm and up to 4 cm in T3 and T4, so the authors conclude that PME is a safe procedure in those in whom a 5 cm margin can be obtained for T3 and T4 tumors. This indicates that TME should be performed for tumors located up to 5 cm proximal to the most distal part of the mesorectum, as measured by preoperative MRI. Furthermore, it implies that not all patients with rectal cancer should be treated with formal TME.

In patients with non-locally advanced disease (T1-T3a), the risk of DMS may be lower, and therefore a smaller distal oncologic safety margin may be acceptable in pursuit of a better functional outcome. However, the greatest safety for any tumor stage appears to be to continue with a 5 cm distal margin whenever possible based on tumor location and to reserve a smaller resection margin, always accompanied by resection of the entire mesorectum, for low rectal tumors.

It is important to note that the literature data are not robust enough to allow firm conclusions as DMS is often poorly reported. It is advisable to perform a detailed preoperative assessment of the distal mesorectal anatomy on MRI and discuss with the patient the balance between oncological safety and functional outcome, to guide the decision on the level of mesorectal transection.[21]

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