Editorial

The Shortcomings of Radiologic Staging for Rectal Cancer and the Impact on the Treatment Plan

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Pre-operative staging of rectal cancer is an essential step in allocating the right treatment to the right patient. Stage I and II rectal cancer do not require neoadjuvant chemoradiation and adjuvant chemotherapy while stage III and IV require such treatment according to the National Institute of Health consensus.[1] Therefore, it is imperative to obtain accurate staging of rectal cancer prior to initiation of treatment. In the earliest report about endorectal ultrasound (EUS) from the University of Minnesota, Douglas Wong, a pioneer in the field reported an accuracy of 95% for depth of invasion and 88% for the lymph node stage.[2] Julio Garcia-Aguilar who continued the work of Wong reported in 2002 from the same university a much lower accuracy for depth of invasion at 69% and 64% for the lymph node stage[3] Garcia-Aguilar concluded that the accuracy of ultrasound was lower than reported earlier especially for early tumors.

In this issue of the Journal, Aljebreen *et al.*, utilized ultrasound with its above-mentioned accuracy as the reference test for multi-detector row computerized tomography (MDCT).[4] The authors pointed out that it was impossible to use the pathological stage as a reference since most of the tumors were subjected to neoadjuvant chemoradiation. This kind of treatment potentially down stages the tumors.

The authors found low level of concordance between MDCT and EUS for the depth of invasion while there was a better concordance for the lymph node stage. However, the study did not address the impact of the level of the tumor on the accuracy of staging. Both EUS and MDCT have poor accuracy for low tumors compared to mid and high rectal tumors[4,5] In their report, the authors do not mention the median distance of the tumors from the anal verge. If most of the tumors in the study were located in the lower third of the rectum, then magnetic resonance imaging (MRI) would have been a better choice as a reference test for MDCT compared to EUS. MRI has an accuracy of 87.1% for the depth of invasion and 84.4% for the lymph node stage.[6]

The interestingly low concordance between MDCT and EUS with regard to the depth of invasion proves the finding witnessed with EUS; high accuracy as the radiologic modality is introduced into clinical practice that drops with time and plateaus at a modest level with more experience gained. In earlier reports in 2003, the accuracy of MDCT was reported at 95.2% for the depth of invasion and 61.9% for the lymph node stage.[7] This is much higher than what was reported in this study; however, the low accuracy for MDCT reported in this study lends credibility and strength to its findings.

The authors used Aloka ProSound α 10 machine (7.5-10 MHz) to stage rectal cancer. However, use of flexible scopes is associated with less accuracy compared to rigid ultrasound probes.[8] This will likely affect the concordance between MDCT and EUS. Moreover, rigid ultrasound probes are more accurate for low rectal tumors.[8]

An important finding that the authors did not dwell upon, which is alarming, is the degree of understaging. As tumors are understaged from stages III and IV to stages I and II, treatment options are changed drastically. Such patients may be denied neoadjuvant chemoradiation, and thus the chances of local recurrence are increased from 14% to 29%.[9] The authors reported that 26% and 12% of the patient sample were understaged by MDCT for the depth of invasion and lymph node stage, respectively. Such a high percentage of understaging could easily be under-treated, and thus the chances of recurrence are potentially increased. The authors did not show in their report how many of the patients moved from stage III to stage II where neoadjuvant treatment is not indicated.

Nonetheless, Aljebreen, *et al.*, pointed out that the results of several radiologic modalities in the staging of rectal cancer are complementary rather than competitive. Although they pointed out correctly that MDCT has poor accuracy, they did not go the full-length in their recommendation to discourage the use of such a modality for local staging of rectal cancer. If MDCT has poor accuracy for the depth of invasion and is much inferior to MRI with regard to assessing the lymph node stage,[6] then MDCT use should be limited

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to identifying distant extra-pelvic metastasis only.

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