COMMUNICATION

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The "y" Symbol: An Important Classification Tool for Neoadjuvant Cancer Treatment

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The use of preoperative adjuvant therapy is becoming increasingly frequent for a number of tumors; both chemotherapy and radiotherapy either singly or combined affect the anatomic extent of disease. Therefore, the pathologic classification after preoperative therapy may not reflect the true anatomic extent of disease before treatment. Therefore, only the clinical classification should be recorded for cancer registry and epidemiologic purposes. To indicate that the clinical or pathologic classification has been determined after preoperative therapy, the TNM classification of the International Union Against Cancer[1] and American Joint Committee on Cancer[2] includes a prefix "y," with yc indicating the clinical classification and yp the pathologic classification.

"y Symbol

In those cases in which classification is performed during or after initial multimodality therapy, the cTNM or pTNM category is identified by a "y" prefix. The ycTNM or ypTNM categorizes the extent of tumor that actually is present at the time of each respective examination. The "y" categorization is not an estimate of the extent of tumor before multimodality therapy.

The ypTNM classification deals with the extent of cancer after therapy. Therefore, ypTNM should consider only viable tumor cells and not signs of regressed tumor tissue such as scars, fibrotic areas, fibrotic nodules, granulation tissue, or mucin lakes.[3] It is important to note this point, because in previous editions of the TNM classification, the definition of the "y" symbol did not specify whether signs of regressed tumor should be taken into consideration.

The following illustrates the use of the "y" prefix. A patient presents with a rectal tumor. Preoperative imaging shows that the tumor extends into the perirectal fat. There is 1 enlarged perirectal lymph

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node and no evidence of distant metastases. The patient receives preoperative chemoradiation. Before surgery, there is no evidence of the tumor on clinical and radiologic examination, and a clinical complete response has been achieved. Surgery is performed and the pathology report reveals residual tumor invading into the submucosa. There is no evidence of tumor in 16 lymph nodes, but 1 lymph node contains a mucin lake.

For this patient, the TNM classification is:

Before any treatment: cT3N1M0

After neoadjuvant therapy: ycT0N0M0

After surgery: ypT1N0M0

Although the clinical extent of disease should be recorded for cancer registry and epidemiologic studies, the anatomic extent of disease as described by the ypTNM classification after preoperative therapy remains of great prognostic significance as has been demonstrated for a variety of common tumors.[4–7]

REFERENCES

1. Sobin LH, Wittekind C, editors. *TNM classification of malignant tumors*. 6th ed. New York: John Wiley & Sons, 2002.
2. Greene FL, Page DL, Fleming ID, et al., editors. *AJCC cancer staging manual*. 6th ed. New York: Springer-Verlag, 2002
3. Wittekind C, Henson DE, Hutter RVP, Sobin LH. *UICC TNM Supplement: a commentary on uniform use*. 3rd ed. New York: John Wiley & Sons, Inc.; 2003.
4. Rohatgi PR, Swisher SG, Correa AM, et al. Failure patterns correlate with the proportion of residual carcinoma after preoperative chemoradiotherapy for carcinoma of the esophagus. *Cancer*. 2005;104:1349–1355.
5. Martin J, Ginsberg RJ, Venkatraman ES, et al. Long-term results of combined-modality therapy in resectable non-small-cell lung cancer. *J Clin Oncol*. 2002;20:1989–1995.
6. Shia J, Guillem JG, Moore HG, et al. Patterns of morphologic alteration in residual rectal carcinoma following preoperative chemoradiation and their association with long-term outcome. *Am J Surg Pathol*. 2004;28:215–223.
7. Carey LA, Metzger R, Dees EC, et al. American Joint Committee on Cancer tumor-node-metastasis stage after neoadjuvant chemotherapy and breast cancer outcome. *J Natl Cancer Inst*. 2005;97:1137–1142.