Recurrence Rates after Resection of Thoracic Esophageal Carcinoma According to the New TNM Classification

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Abstract

In accordance with the new TNM classification the recurrence rate in our own cases of thoracic esophageal carcinoma were appraised. In the T-classification, the recurrence rate became higher with increasing depth of intramural invasion and there was a significant difference in recurrence rate between T3 and T4. Significant differences in recurrence rate were also noted among cases classified as N0, N1 and M1 (LYM) in the N-classification, the recurrence rate being highest for M1 (LYM).

Furthermore, the recurrence rate was shown with increasing degree of disease advancement, being significantly different between stage IV and stage III, and between stage III and stage II B.

Concerning the problem of handling perigastric nodes in the N-classification of the new TNM classification system, relevant literature was reviewed and some comments were made. To treat the left gastric nodes and celiac nodes indiscriminately as a whole, seems to be appropriated from viewpoint of recurrence rate and will serve the main purpose of the TNM classification which attaches importance to preoperative diagnosis.

Introduction

The Japanese Society for Esophageal Diseases was established in 1965 and guidelines for clinical and pathologic studies on esophageal carcinoma (referred hereinafter to as the Japanese classification) were published in 1969 and translated into English in 19761. Since then, the extent of spread of esophageal carcinoma has been assessed and recorded in accordance with these guidelines. Based on therapeutic data compiled in compliance with the Japanese classification, a proposal was made for a new TNM classification in 19852, and subsequently in 1987, the new TNM Classification of Malignant Tumors, Fourth Fully Revised Edition was published3.

The purpose of this paper is to present the
results of our recent study on the recurrence rate of thoracic esophageal carcinoma following surgical resection based on the new TNM classification.

Patients and Methods

A total of 263 patients with carcinoma of the esophagus were treated at our institute during the period from April 1973 through March 1986. Removal of the tumor was performed in 200 of the patients. Of these resected cases, 168 cases were the subjects of this investigation excluding direct operative deaths, carcinoma of the cervical esophagus and cases in which cancer was retained macroscopically.

The T-classification according to the new TNM classification is based on the depth of invasion of tumors. Namely, the new Tis represents a tumor which is a carcinoma in situ. The new T1 represents a tumor invading the lamina propriae or submucosa, the new T2 a tumor invading the muscularis propriae, the new T3 a tumor invading the adventitia, and the new T4 a tumor invading adjacent structures.

The former N-classification defines regional lymph nodes as mediastinal nodes. However, the new N-classification contains not only mediastinal nodes, but also perigastric nodes as regional lymph nodes. The perigastric nodes consist of the right and left cardiac nodes, lesser and great curvature nodes, and the supra-and sub-pyloric nodes. Metastasis to these nodes describes a notation, N1. Any nodes other than the perigastric nodes should be dealt with distant nodes. Therefore, involvement of these distant nodes is placed in a new category, M1 (LYM) according to the M-classification. Hence, the stages of diseases should be set as follows:

Stage 0 (Tis, N0, M0)
Stage I (T1, N0, M0)
Stage II a (T2, O0, M0)
(T3, N0, M0)
Stage II b (T1, N1, M0)
(T2, N1, M0)
Stage III (T3, N1, M0)
(T4, any N, M0)
Stage IV (any T, any N, M1)

Table 1 Differences in the distribution by stage of the disease between the new TNM and the Japanese classification (Kyorin Univ. 1987)

<table>
<thead>
<tr>
<th>the new TNM classification cases (%)</th>
<th>vs.</th>
<th>the Japanese classification cases (%)</th>
</tr>
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<tbody>
<tr>
<td>stage-0 4(2.4%)</td>
<td>stage-0 18(10.7%)</td>
<td></td>
</tr>
<tr>
<td>stage-I 14(8.3%)</td>
<td>stage-1 10(5.9%)</td>
<td></td>
</tr>
<tr>
<td>stage-II a 45(26.8%)</td>
<td>stage-2 16(9.5%)</td>
<td></td>
</tr>
<tr>
<td>stage-II b 11(6.5%)</td>
<td>stage-3 54(34.1%)</td>
<td></td>
</tr>
<tr>
<td>stage-III 52(31.0%)</td>
<td>stage-4 70(41.7%)</td>
<td></td>
</tr>
<tr>
<td>stage-IV 42(25.0%)</td>
<td>total 168(100.0%)</td>
<td></td>
</tr>
<tr>
<td>total 168(100.0%)</td>
<td>total 168(100.0%)</td>
<td></td>
</tr>
</tbody>
</table>

P<0.01 (X2-test)

Stage I (T1, N0, M0)
Stage II a (T2, O0, M0)
(T3, N0, M0)
Stage II b (T1, N1, M0)
(T2, N1, M0)
Stage III (T3, N1, M0)
(T4, any N, M0)
Stage IV (any T, any N, M1)

Results

Table 1 shows the 168 cases who were classified by stage of the disease according to the new TNM classification and the Japanese classification. A significant difference was found in the distribution by stage of the disease between both classifications. This originated from the essential differences between the new TNM classification and the Japanese classification.

Recurrence of our cases would be referred from here. Figure 1 shows recurrence rates by T-classification according to the new TNM classification. The post-operative six-month recurrent ratios for T1 is zero, T2 is 22.2%, T3 is 33.4% and T4 is 66.3%. However, no recurrence occurred in 4 cases of carcinoma in situ (Tis). There was a statistical signifi-
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Fig. 1 Recurrence rates according to the TNM classification...T-classification...(Kyorin Univ. 1987)

Fig. 2 Recurrence rates according to the TNM classification...N-classification...(Kyorin Univ. 1987)

Figure 3 shows the recurrence rates by stage of the diseases according to the new TNM classification. The post-operative six-month recurrent ratios for stage I and stage II B is zero, stage II A is 23.1%, stage III is 39.7% and stage IV is 72.3%, but no recurrence occurs in stage 0. The recurrence curves for stage II A and stage II B may take another cance in the recurrent ratios of the T-classification.

Figure 2 also shows the recurrence rate by the N-classification. The post-operative six-month recurrent ratios for M1 (LYM) has a high ratio of 77.5%, and when this is compared with N1 and N0, there are significant differences, as can be seen from the table.
Fig. 3 Recurrence rates according to the TNM classification...Stages of the disease... (Kyorin Univ. 1987)

Fig. 4 Recurrence rates according to the Japanese classification...Histological stages of the disease... (Kyorin Univ. 1987)

place respectively.

There were statistical significant differences in the recurrence rate by stage of the disease, hence the recurrence curves are arranged in good order. Generally, when the stage of the disease worsens, recurrence occurs earlier.

Figure 4 shows the recurrence rates by stage of the disease in accordance with the Japanese classification. The recurrence curves for stage 1 and stage 2 may be confused with that for stage 3. Furthermore, recurrences take place even in stage 0 according to the Japanese classification. There were significant differences in Table 5, as can be seen.
In Figure 5, two kinds of recurrence curves are described. One is for stage III and stage IV according to the new TNM classification. The other is for stage 4 according to the Japanese classification. As can be seen, the recurrence curves for stage 4 according to the Japanese classification is just half-way between that for stage III and stage IV according to the new TNM classification. There were statistical significant differences in the recurrence rates respectively. Conversely, it is implied that recurrence rate of stage IV according to the new TNM classification is very high. In other words, the new TNM system is more useful than the Japanese system. This is especially due to the effectiveness of the N-classification.

**Discussion**

In 1987, the 4th edition of the new TNM classification was published. This new TNM classification system is based upon long-term observation on thoracic esophageal carcinoma resected in Japan and encompasses the T-classification, the N-classification and the M-classification for the staging of the disease. The T-classification is based upon the histological assessment of the depth of intramural invasion and, accordingly, seems to questionably serve the purpose of the TNM classification system since it was originally intended for determining the extent of the local tumor before surgery, aiding the clinician in planning of treatment and providing some indication of prognosis. It is presupposed that the depth of intramural invasion may be correctly assessed pre-operative by means of x-ray examination, endoscopy, ultrasonography and other techniques. In the new system, the M-classification is based upon the presence or absence of distant metastasis and, above all, a notation of lymph nodes (LYM) is included. This is substantially different from the Japanese classification. Moreover, the new system, although similar to the Japanese classification in the T-classification and M-classification except for LYM, differs greatly from the latter classification in the N-classification (including LYM) mentioned below.
In thoracic esophageal carcinoma, the mediastinal and perigastric lymph nodes, excluding the coeliac nodes, are considered as representing regional lymph nodes, and metastatic involvement of any these regional lymph nodes is indicated by symbol N1. Metastases beyond the limit of these nodes are labeled as M1 (LYM). Namely, metastasis to the abdominal lymph nodes other than the perigastric nodes are considered to be M1 (LYM).

Ultrasonography has recently proved of value as a means of detecting metastasis to the abdominal lymph nodes. However, differentiation between the left gastric artery lymph nodes and the coelica artery lymph nodes is still debatable and becomes even more difficult to confirm especially when they are involved. In addition, the left gastric artery lymph nodes are anatomically included in the coeliac artery lymph nodes. In the present study, the recurrence rates were calculated by treating lymph nodes in the area of distribution of these both arteries as a whole.

Conclusion

When our own cases were analyzed according to the new TNM classification, it became obvious that the recurrence rate was higher with increasing depth of intramural invasion, with significant difference between cases classified as T4 and those classified as T3. Significant differences in the recurrence rate were also observed among cases classified in the N-classification, N0, N1 and M1 (LYM).

The new TNM classification thus appeared to be useful for evaluation of the results of surgical treatment.

A postscript: This paper was presented in part at the Third Congress of the Japanese Section of the International Society for Diseases of the Esophagus, Osaka, Japan, June 16, 1987.

References