

Original Article

New WHO histologic classification predicts prognosis of thymic epithelial tumors

A clinicopathologic study of 200 thymoma cases from China

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thymoma • thymus • WHO • classification • pathology • prognosis • surgery • radiation • oncology • chemotherapy

Abstract

BACKGROUND

In 1999, a World Health Organization (WHO) committee published histologic criteria for distinct thymoma entities (labeled as Type A, AB, B1, B2, B3 thymomas) and for the heterogeneous group of thymic carcinomas, collectively called Type C thymomas. Whether WHO-defined histologic thymoma subtypes are of independent prognostic relevance has yet to be proved.

METHODS

Two hundred thymomas from the Shanghai Chest Hospital with a mean follow-up time of 15 years (range, 1-246 months) were studied for the relevance of WHO histologic subtype and other factors (stage, therapy, and myasthenia gravis [MG]) for survival.

RESULTS

In order of frequency, 68 patients (34.0%) had Type AB, 39 (19.5%) had Type B2, 36 (18.0%) had Type C, 27 (13.5%) had Type B3, 17 (8.5%) had Type B1, and 8 (4.0%) had Type A thymoma. Five cases (2.5%) were rare thymomas not mentioned in the WHO

classification. Survival data showed significant differences among the histologic subtypes (log rank test: $P < 0.001$). Among patients with Type A and AB thymomas, none died of tumor; of the Type B1 thymoma patients, only one (5.9%) died at 22 months. Type B2, B3, and C thymomas had a significantly worse prognosis with 5-year survival rates of 75.0%, 70.0%, and 48.0%, respectively. Ninety-six patients (48.0%) were in Masaoka Stage I, 26 (13.0%) were in Stage II, 65 (32.5%) were in Stage III, and 13 (6.5%) were in Stage IV. Stage was highly significant in predicting survival (log rank, test $P < 0.001$). The association between histologic subtype and invasive behavior (stage) was statistically significant ($P < 0.001$). However, histology was an independent predictive factor of survival in Stage I and II thymomas: Type B2, B3, and C thymomas had a worse prognosis than Type A, AB, and B1 thymomas (log rank test: $P < 0.003$). Thirty patients (15.0%) presented with MG. MG was significantly more frequent in Type B2 and B3 than in Type A, AB, and B1 thymomas ($P < 0.01$). On multivariate analysis, MG had no adverse effect on survival ($P = 0.17$). Radiation or chemotherapy improved patients' survival at 5 and 10 years in Type B2, B3, and C thymomas (log rank test: $P < 0.003$).

CONCLUSIONS

Tumor stage is the most important determinant of survival in thymoma patients, but the WHO histologic subtype is an independent prognostic factor in Stage I and II thymomas, among which WHO Type A, AB, and B1 thymomas form a low-risk group. Patients with high-risk thymomas might profit from novel adjuvant radiochemotherapy regimens.

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