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Are the morphology of papillary thyroid carcinoma and the tumour's behaviour correlated?

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Abstract
Six cases of papillary thyroid carcinoma showing clinically highly aggressive behaviour by invading the upper airway and digestive tract structures were retrospectively reviewed to evaluate the morphological variants of the tumours. Four of them were found to be pure papillary and one was a mixed-papillary and follicular-variants regarded as non-aggressive. Only one case was found to be tall cell variant – regarded as an aggressive variant of papillary thyroid carcinoma. The findings suggest that the prognosis of papillary thyroid carcinoma cannot be predicted from its morphological variant and attention should be given to other clinical parameters.

Key words: Thyroid neoplasms; Carcinoma, papillary

Introduction

Papillary thyroid carcinoma (PTC) manifests heterogenic histomorphological features (Hicks and Batsakis, 1993). The usual non-aggressive variants of this tumour are pure papillary and mixed-papillary and follicular. Variants that are regarded as more aggressive are tall cell, columnar cell, and diffuse sclerosing (Damiani *et al.*, 1994). Six PTCs showing clinical highly aggressive behaviour by invading the upper airway and the digestive tract structures were retrospectively reviewed to evaluate the possible presence of more aggressive morphological variants (tall cell, columnar cell, and diffuse sclerosing).

Patients and results

Histological specimens from six patients presented with PTC invading the upper airway and the digestive tract structures were retrospectively reviewed to evaluate the morphological features. They were four men and two women. The age at the time of the initial diagnosis of the thyroid carcinoma ranged from 45 years to 79 years (mean, 59 years). All the patients presented with extrathyroidal extension of the malignant tumour to the upper airway structures at the same time as the primary carcinoma was diagnosed in the thyroid gland. Three patients received further surgery because of recurrent disease. Table I shows the clinical features of the patients and the morphological findings.

The histological specimens were originally diagnosed as a pure papillary variant (four patients) and a mixed-papillary and follicular variant (two patients). The histopathological specimens were reviewed. Four patients were found to suffer from a pure papillary variant of PTC, one patient from mixed-papillary and follicular variant and only one patient (Table I, No. 5) suffered from the tall cell variant of PTC (Figure 1). No columnar nor diffuse sclerosing variant was found.

Discussion

Papillary carcinoma is the most common malignant tumour of the thyroid gland and generally associated with a good prognosis (Flint *et al.*, 1991). This tumour manifests heterogenic histomorphological features, its patterns including pure papillary, mixed-papillary and follicular, diffuse sclerosing, tall cell and columnar cell types (Hicks and Batsakis, 1993). Some of these patterns are inconsequential so far as biological behaviour is concerned.

TABLE I
THE CLINICAL FEATURES OF THE PATIENTS AND THE MORPHOLOGICAL VARIANTS

Patient no.	Age (years)	Sex (F/M)	Extrathyroidal invasion	Recurrence	Morphological variants
1	79	F	Cricoid	—	Pure papillary
2	48	M	Larynx, trachea, and oesophagus	—	Mixed-papillary and follicular
3	52	M	Trachea	1. Larynx and trachea 2. Neck	Pure papillary
4	60	F	Larynx and trachea	Neck	Pure papillary
5	70	M	Tracheal wall	Trachea and neck	Tall cell
6	45	M	Trachea	—	Pure papillary

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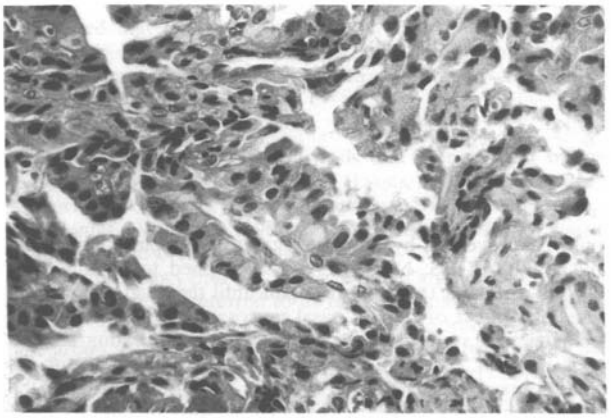

FIG. 1

Papillary thyroid carcinoma with tumour cells which are almost twice as tall as their width, and have nuclei which are defined as not clear (H & E; × 250).

Others are associated with significant prognostic implications and are therefore clinically important (Hicks and Batsakis, 1993).

An infrequent variant of PTC is the tall cell variant. This variant, which was first described by Hawk and Hazard in 1976, is found only in 9.3 per cent of the patients with PTC (Hawk and Hazard, 1976; Hicks and Batsakis, 1993). The tall cell variant of PTC is characterized by a papillary carcinoma of the thyroid gland in which more than 30 per cent of the tumour is made up of a population of tall columnar cells over twice as tall as their width (Moreno *et al.*, 1993). Its histological features are characterized by a basal orientation of nuclei, abundant eosinophilic or oxyphilic cytoplasm, and cellular height-width ratio greater than 2:1 (Hicks and Batsakis, 1993; Moreno *et al.*, 1993) (Figure 1). Papillary architecture is typical, but foci of follicles can be found. Calcospherites are less often present than in the usual PTC (Hicks and Batsakis, 1993). Differences between the tall cell variant and the usual PTC cells regarding DNA content, chromatin texture, or nuclear size and shape were not observed (Flint *et al.*, 1991).

Comparing this type of lesion with those of the classical PTC (pure papillary and mixed-papillary and follicular variants) shows that the tall cell variant is characterized by later age of appearance, greater predilection for males, greater frequency of extrathyroid tumour extensions, greater frequency of recurrence, and a shorter survival or disease-free interval (Moreno *et al.*, 1993), and therefore, is regarded as an aggressive variant of PTC (Flint *et al.*, 1991; Hicks and Batsakis, 1993; Moreno *et al.*, 1993; Damiani *et al.*, 1994), with an expected 75 per cent metastases rate to cervical lymph nodes, a 42 per cent extrathyroidal (cervical soft tissues) extension rate, a 58 per cent local recurrence rate, a 17 per cent incidence of distant metastases (Johnson *et al.*, 1988), and a 20–25 per cent lethality (Hawk and Hazard, 1976; Johnson *et al.*, 1988; Hicks and Batsakis, 1993).

All of the patients presented with highly aggressive PTC. Although the more aggressive histological variants of PTC are not common, we expected that the incidence of those histological variants among our patients would be higher; but only one out of our six patients presented with a tall cell variant. Four patients had a pure papillary variant and one had mixed – papillary and follicular variant – variants regarded as non-aggressive types of PTC.

Although our series is small, our findings suggest that the prognosis of PTC should not always be based on its morphological variants. Generally, more attention should be given to other parameters such as patients' age, tumour size, tumour extension, and metastasis at the time of presentation, and the treatment should be performed accordingly.

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