The Prognosis and Insurability of Thyroid Cancer Patients

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In assessing the probabilities of long-term survival of cancer patients, numerous factors merit consideration. Some of them are peculiarly applicable for growths that arise primarily in the thyroid gland. These include: the morphologic tumor type; the stage of disease at time of treatment as measured by tumor size, regional spread and presence or absence of metastases to distant sites; a history of prior treatment for this condition; and the race and sex of the patient. Reliable data in these areas are reasonably easy to obtain and some are pertinent to this discussion.

General Considerations

Cancers of the thyroid gland comprise a heterogeneous group of neoplasms. A noteworthy feature is a diversity in morphology which may prove troublesome to the clinician and pathologist. Knowledge of the histologic components is essential, however, since certain of them are associated with characteristic and often predictable clinical features. Thyroid cancer is an uncommon disease, which is approximately twice as common among females as among males. It occurs in all age groups from childhood to advanced age. Causative factors are uncertain, but there is negligible evidence of its relationship to nodular goiter. On the other hand, a history of exposure to ionizing irradiation, either to the whole body or neck, is significant. Precise data concerning the probable duration of the disease in a given patient is exceedingly difficult to determine. Some patients live for years or even decades with their cancers, despite regional lymph node metastases or even distant spread. In others, the disease follows a rapidly lethal course.

Prognostic Features

Specific Tumor Types

Pathologists generally recognize three main morphologic categories of thyroid cancer with numerous subtypes. (Table 1.) The largest category (73 percent) consists of well-differentiated tumors which are usually papillary or mixed papillary (60 percent). They tend to run a prolonged and relatively benign course with certain exceptions. A much smaller group (six

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TABLE 1 – CANCER OF THE THYROID – 1930-1960

1. Well-differentiated carcinoma		872
Papillary	719	
Follicular	153	
2. Poorly differentiated carcinoma		74
Spindle and giant cell carcinoma	62	
Anaplastic carcinoma	12	
3. Miscellaneous types of carcinoma		133
Hurthle cell tumors	55	
Hazard-Crile	8	
Solid, medullary, large cell, Horn type	70	
4. Sarcoma		2
5. Lymphoma		19
6. Classification uncertain		92
		1,192

percent) of poorly differentiated cancers are usually highly malignant. Carcinoma in the miscellaneous group (11 percent) occupy a somewhat mid-position. The remaining groups are relatively infrequent and do not permit meaningful clinicopathologic analysis. End results, as measured by five-year survivals of thyroid cancer patients whose initial or primary treatment was given in our clinic, confirms the relationship between histologic type and prognosis. (Table 2.) These data obtained by simple, direct calculations confirm why papillary tumors are appropriately labelled "low-grade." Also confirmed is the fact that survival from thyroid cancer is not synonymous with cure even after prolonged observation periods.

Since papillary tumors are the most common form of thyroid cancer, and since they are prone to run a prolonged clinical course, they are of considerable interest to the medical actuary. For purposes of this discussion, the present detailed studies of 441 patients with this form of cancer treated in our clinic were available for a minimum of five-year follow-up studies. (Table 3.)

TABLE 2 – CANCER OF THE THYROID
5-YEAR END RESULTS – PRIMARY CASES TREATED*
1930-1960

	Survivals – %	"Cures" – %
1. Well-Differentiated		
Papillary (441)	80	72
Follicular (68)	60	52
2. Poorly differentiated		
Spindle and giant cell (37)	2	2
Anaplastic (9)	–	–
3. Miscellaneous Types		
Hurthle cell (48)	67	59
Hazard-Crile (8)	100	100
Solid, medullary, etc. (62)	40	34

*Direct calculations.

TABLE 3 – PAPILLARY CANCER OF THE THYROID
SURVIVAL RATES IN 441 PRIMARY TREATED CASES
1930-1960

Minimum follow-up (years)	Observed rate – %	Standard error – %	Expected rate – %*
5	88.2	1.5	98.8
10	85.9	2.2	97.8
15	81.7	4.0	95.5
20	78.0	5.5	91.9

*Life-table survival experience of white females of comparable age, New England Division, U.S., 1959-1961.

TABLE 4 – PAPILLARY CANCER OF THE THYROID
OBSERVED END RESULTS IN MALE PATIENTS
1930-1960

Observation period – years	5	10	15	20
Primary cases treated	141	107	70	37
Determinate cases	131	93	53	26
Survivals – %	82	76	62	58
"Cures" – %	67	66	55	54

Sex

As previously noted, only about one third of the thyroid cancer patients were male. It is true that when survival rates for male and female patients are studied by direct method calculations, the rate for men (83 percent) was somewhat lower than that for women (88 percent). (Tables 4 and 5.) Further analysis reveals at least two features that account for this difference: the greater prevalence of large tumors and the proportion of older patients among the men. (Table 6.) Approximately 80 percent of the female patients had small tumors, i.e., less than 5 cm. in diameter, while in male patients less than 60 percent had tumors of comparable size. Likewise, 50 percent of the female patients were under the age of 40 at the time of diagnosis, while only 39 percent of the males were of this age group. As will be shown, these two variables are of prognostic importance in papillary thyroid cancer and would readily explain the survival differences between men and women.

Size of Primary Tumors

The effect on prognosis of the measured size of the primary lesion was examined by the actuarial method. (Table 7.) The basis of comparison was the 1959-1961 life-table experiences among white females in the United

TABLE 5 – PAPILLARY CANCER OF THE THYROID
OBSERVED END RESULTS IN FEMALE PATIENTS
1930-1960

Observation period – years	5	10	15	20
Primary cases treated	300	216	116	52
Determinate cases	282	197	96	44
Survivals – %	88	85	67	50
"Cures" – %	82	79	61	43

TABLE 6 – PAPILLARY CANCER OF THE THYROID
AGE DISTRIBUTION AND TUMOR SIZE ACCORDING TO SEX
1930-1960

Size of tumor	Females (300) Number	Males (141) Number
<5 cm.	239 (79.7%)	83 (58.9%)
>5 cm.	39 (13.0%)	32 (22.7%)
?	22 (7.3%)	26 (18.4%)
Age of patient		
<40	168 (56.0%)	55 (39.0%)
>40	132 (44.0%)	86 (61.0%)

TABLE 7 – PAPILLARY CANCER OF THE THYROID
SURVIVAL RATES ACCORDING TO SIZE OF TUMOR
1930-1960

Follow-up	Tumors under 5 cm. (322) Observed %	Standard error %	Expected %*	Tumors 5 cm. or over (75) Observed %	Standard error %	Expected %*
5 years	92.5	1.5	99.2	69.7	6.5	97.2
10 years	91.8	2.0	98.7	61.9	7.0	94.8
15 years	90.4	3.8	96.5	53.5	7.0	87.5
20 years	90.4	4.0	93.2	39.4	7.0	76.9

*Life-table survival experience.

TABLE 8 – PAPILLARY CANCER OF THE THYROID
SURVIVAL RATES ACCORDING TO AGE ON ADMISSION
1930-1960

Follow-up	<40 years (223 cases) Observed %	Error %	Expected %*	>40 years (218 cases) Observed %	Error %	Expected %*
5 years	98.2	1.5	99.5	77.6	3.5	95.8
10 years	97.5	2.0	99.0	74.1	4.3	92.5
15 years	95.7	2.5	98.3	66.5	6.8	84.6
20 years	89.3	4.0	97.2	66.5	6.8	69.9

*Life-table survival experience of white females of comparable age, New England Division, U.S., 1959-61.

States, of comparable age and geographic area. The overwhelming majority of patients had small tumors and, as previously noted, the sample was heavily weighted with women. The difference in survival rates between patients with small tumors and those with large ones is outstanding at each interval of recorded follow-up.

Age of the Patient

When the age of the patient at the time of diagnosis is taken into account, the difference in survival rates at each period of follow-up after diagnosis is significant. (Table 8.) The under 40 age group had a much higher survival rate during all follow-up periods in which they were observed.

Age Plus Tumor Size

If one takes into account the age of patients with small tumors and of those

TABLE 9 – PAPILLARY CANCER OF THE THYROID
SURVIVAL RATES ACCORDING TO SIZE OF TUMOR AND AGE OF PATIENT
1930-1960

	Tumors under 5 cm. (322)			Tumors 5 cm. or over (75)		
Follow-up	Observed %	Error %	Expected %	Observed %	Error %	Expected %
5 years <40	98.4	1.5	99.5	100.0*	3.0	99.5
>40	85.1	3.1	95.8	56.3	7.0	95.8
10 years <40	98.4	2.0	99.0	90.9*	4.0	99.0
>40	83.5	4.0	92.5	49.1*	7.0	92.5
15 years <40	96.1	3.0	98.3	90.9*	4.0	98.3
>40	83.5	5.3	84.6	37.7*	7.0	84.6
20 years <40	96.1	3.0	97.2	54.6*	7.0	97.2
>40	83.5*	5.3	70.0	37.7*	7.0	69.9

*Based on less than 20 patients.

with large tumors, the potential advantage of both having a small papillary thyroid cancer and being under forty at the time of diagnosis seems obvious. (Table 9.) This advantage persists for long periods of follow-up, though in some cases the samples become small.

Summary and Conclusion

A large series of thyroid cancer patients treated initially in our clinic was subjected to prolonged follow-up studies. The morphologic tumor type is the single most important prognostic feature. End-result studies indicate that well-differentiated tumors of papillary type have an excellent prognosis provided that the tumors are small and the patient is less than 40 years of age at the time of diagnosis and treatment. This should have considerable bearing on the insurability of patients in this category.

Trust breeds itself, and while a trustful patient deserves a compassionate physician, a trusting physician must assure himself at least of an understanding patient.

—Chauncey D. Leake, "Ethical Theories and Human Experimentation." *Annals of the New York Academy of Sciences* 1969: 393, 1970.