AN AUTOPSY CASE OF THYROID CARCINOMA WITH WIDE-SPREAD METASTASIS

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(Received for Publication February 29, 1964)

It is well known that metastasis of thyroid carcinoma frequently occurs in the bone. However, cases are rare in which severe general skeletal metastasis are demonstrated and small primary thyroid carcinoma can not be detected clinically.

The author will report here an autopsy case of clinically latent thyroid carcinoma with intensive bone and lung metastases.

CASE HISTORY

The patient: 66 year-old Japanese male.
Chief complaint: Complete paralyses of both lower extremities.
Past history: Not remarkable.
Family history: His wife died at the age of 51 from carcinoma of the uterus.
History of illness: In the spring of 1959, the patient first noted motoric paralyses of both lower extremities. He was given physical treatment for about two months at home. But, the disorders did not subside. In the spring of 1960, he noted hypesthesia of both lower extremities. These symptoms gradually increased. In the spring of 1961, he had urinary incontinence and hydrocele testis. In October of 1961, he was admitted to Beppu National Hospital, the chief complaint being paralyses of both lower extremities.

Condition at time of hospital admittance: Physical examination revealed a 64 year-old, emaciated, chronically ill patient. Pulse was 80, and regular, axillary temperature was 36.8 degree C. The patient could not walk. Both lower extremities were spastic.

Knee and ankle reflexes were negative. Babinski-reflex and patellar clonus were both negative.

Sensory examination: There was complete anesthesia in both lower extremities.

Skeletal examination revealed moderate pain on percussion and from pressure over the thoracal and lumbar spinous processes. Moreover, there was incontinence of urine and feces, and hydrocele testis.

Raboratory reports: The urine was straw-colored and cloudy with an acid reaction. Specific gravity was 1.025. There were no albumin and no sugar. There were 5-10 white blood cells and epithelial sediments per high power field in the urine. The test for Bence-Jones protein in the urine was negative on some occasions. Examinations of the blood disclosed 87 per cent hemoglobin, a red cell count of 4.05
million, a white cell count of 5000 with a differential count of 7 per cent non-segmented neutrophils, 47 per cent segmented neutrophils, 44 per cent lymphocytes, and 2 per cent monocytes.

Blood chemistry tests showed serum proteins of 6.41 g/dl, in which, there were 64.9 per cent albumin, 3.9 per cent α1, 6.4 per cent α2, 10.4 per cent β, and 14.2 per cent γ-globulin. The alkaliphosphatase was 2.9 Bodansky Units, the acid-phosphatase was 0.7 Lowry Unit. Non-organic phosphorus of the serum was normal, serum calcium of 7.36 mg/dl slightly decreased. Serologic tests for syphilis were negative both in the blood and spinal fluid. The paracenteses from the scrotum disclosed 170 cc in the left side, 65 cc in the right side. The fluid was clear.

The patient was X-rayed in October, 1961. The radiological examination revealed a distinct atrophies by compression and abnormal osteoplastic findings of vertebrae (L1, L2.). Examination of the sternal bone marrow showed slight myeloid hyperplasia.

In March, 1962, a tumor with calcification was found in the soft tissue of the right pelvis, and immediately, a biopsy of the tumor was performed. That specimen showed the pattern of follicular adenocarcinoma with no colloid substances.

The specimen was discussed at the 27th Slide Conference Meeting in Fukuoka. At that time the histological diagnoses shown in the following table was obtained.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenocarcinoma of Prostate</td>
<td>4</td>
</tr>
<tr>
<td>Follicular Adenocarcinoma of Thyroid</td>
<td>2</td>
</tr>
<tr>
<td>Metastatic Clear Cell Carcinoma</td>
<td>2</td>
</tr>
<tr>
<td>Adenocarcinoma of Epididymis</td>
<td>1</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2</td>
</tr>
</tbody>
</table>

In the course of admission, the patient was not given anticancer therapy or radiation treatment. His clinical condition in the hospital gradually declined and he expired on the 11th of February, 1963.

The total course of illness was approximately 4 years after the onset of symptoms. In spite of many efforts made by clinical and laboratory research the primary focus of the malignant tumor could not be recognized until postmortem examination was performed.

POSTMORTEM EXAMINATION

The outline of postmortem findings was as follows: The body was that of a well built, emaciated 66 year old man, measuring approximately 157 cm in length. The neck was not enlarged, and there were no palpable tumors.

The abdomen was distended like a beer barrel. The abdominal cavity contained approximately 4500 cc of a straw-colored, clear fluid. There was marked bilateral pretibial edema in the lower extremities. In the lumbo-sacral region, several decubital ulcers were present. The pleural cavity contained approximately 500 cc of a light amber fluid in the left side and 700 cc in the right side.

The thyroid gland was slightly enlarged on the right side, and revealed one tumor of walnut size and two tumors of grape size of the cut-surface. These parenchymatous tumors were elastic firm, one of which had a boney-like consistency, and they were sharply demarcated and encapsulated. These tumors were situated deeply in the right lobe of the thyroid, so that the surface and the consistency of the thyroid
were not changed remarkably. Lymph nodes of the neck were not swollen.

Histologically, the tumor was composed of small cells with clear cytoplasm, and arranged in micro-follicular fashion. The nucleus was hyperchromatic and small. There was a small amount of colloidal substances in the follicles.

The colloid substances were stained blue by Azan-Mallory's method. The specimen of the tumor showed partly the medullary pattern with no colloidal substance. But, in general, follicular arrangement of cuboidal epithelium was predominant. Silver staining showed distinct follicular architecture of reticular and collagen fibers.

Some tumor cells invaded as small nests or cords in a fibrous capsule, and the permeation of tumor cells into the lumen of the small vein could also be seen.

In the skeletal system, there were scattered metastatic tumors in vertebras (from the 9th to the 12th thoracic and the 1st and 2nd lumbar vertebra), right iliac bone, and occipital bone. The tumor of the right hip was elastic firm in consistency with marked calcification. In the right lung, there was a small metastatic tumor in the inferior lobe. This tumor was distinctly separated from lung parenchyma, and encapsulated by thin fibrous membrane.

Histological features of the metastatic tumor were similar to those of the primary tumor, but rich in blood vessels.

The right kidney was atrophic, and there were small multiple abscesses on the surface and cut-surface of both kidneys. The renal pelves were slightly dilated and contained a small amount of creamy pus. Arteriolosclerosis of the kidney could also be seen histologically.

The urinary bladder contained approximately 20 cc of cloudy urine. The mucous membrane of the urinary bladder was thickened and associated with lesions of hemorrhage. This hemorrhagic cystitis and suppurative pyelonephritis were caused by infection following catheterization over a long period of time.

The prostate was normal size, but there was circumscribed hyperplasia of reserve cells of some secretory glands. Both testes were atrophic. The scrotum showed hydrocele testis with eczema.

Examinations of the other organs revealed the following abnormal changes:

Atrophy of the heart, liver and adrenals, moderate arteriosclerosis of the aorta and coronary arteries, acute catarrhal bronchitis and general anemia.

There were no abnormalities in the brain.

**DISCUSSION**

It is well known that cases of thyroid carcinoma generally show a more prolonged clinical course than cancers in other organs.

Warren, S. and Meissner, W. A. (1953) stated that tumors with minimal cancerous change make up about one fourth of all thyroid cancers. These tumors have been designated by various terminology: malignant adenoma, potentially malignant tumor, benign metastasizing goiter, early cancer, low grade cancer, etc. Warren and Meissner classified these thyroid cancers as low grade, localized carcinoma arising in adenoma. The tumors appear to be grossly benign, but are malignant microscopically because of invasion into fibrous capsule and blood vessels.

The patient reported here lived for 4 years after the onset of spinal symptoms.
The tumors of the thyroid gland could not be detected clinically because of their size and locations. Histologically they were well differentiated follicular adenocarcinomas. They looked like benign nodular adenomas, but they had multiple distant metastases to the bones and right lungs.

There are many studies on the histological classification of thyroid cancer (Graham, A., Wegelin, C., Warren, S., Meissner, W.A., Evans, R.W. and Albertini, A. V.). In all the classifications of the thyroid tumors, there is a category of low grade, malignant tumor (semi-malignant tumor).

This tumor with semi-malignancy is very important from the standpoint of clinical pathology.

Frazell and Foote (1949) found incidence of 54.5 per cent bone metastases in a series of 22 follicular carcinoma of the thyroid. However, according to Lindsay (1960), the rate was 13 per cent.

Katsura et al, showed one case after autopsy with bone metastases in 4 follicular adenocarcinoma of the thyroid.

The author's case might not be so rare as a low grade thyroid follicular carcinoma with multiple bone metastases. But, it presented an important problem clinically.

The thyroid tumors couldn't be touched from the outside through their entire history in spite of the efforts of doctors who suspected their existence. I\textsuperscript{131}-scintigram was not taken because of the absence of palpable tumor, and the lack of symptoms of functional disturbance.

If I\textsuperscript{131}-scintigram had been taken, it is almost certain that a cold type of nodules would have been detected in the thyroid.

Warren, S. (1953), Sloan, L.W. (1954), and Portmann, U.V. (1941) stated that there is little doubt that many thyroid cancers arise from a pre-existing nodule, presumably a benign adenoma because the tumor has a long period (4.1-15.3 years) of clinically average existence before diagnosis.

The author's case also had a long clinical course even after the vertebral metastasis became apparent. But, any opinion concerning the malignant change of the pre-existing thyroid adenomas can not be stated here.

SUMMARY

A case of clinically latent deeply seated thyroid carcinoma with wide-spread skeletal and lung metastases in a 66 year old male was reported.

The patient lived for 4 years after the onset of clinical symptoms and histologically the tumor was well differentiated follicular adenocarcinoma.

Two points should be remembered. First: the primary focus of the malignant tumor could not be found because of its small size, until postmortem examination was performed.

Second: the macroscopic and histologic pattern of these thyroid tumors suggested low-grade malignancy. But, the distinct invasion of tumor cells into the lumen of the small vein could be seen and was the cause of intensive metastases through the blood stream.
ACKNOWLEDGEMENT

The author wishes to express his thanks to Prof. Teruyuki Nakashima for his constant interest and guidance in this investigation.
(This autopsy case was reported at the 4th American-Japanese Pathologic Conference in Fukuoka.)

REFERENCES


(Fig. 1) Three encapsulated tumors in the thyroid gland of the neck.
(Fig. 2) Microscopically, follicular adenocarcinoma in the primary thyroid tumors. Note clear cytoplasm and small nuclei. (H.E).
(Fig. 3) Tumor cells' invasion to blood vessel of fibrous capsule. (H.E).
(Fig. 4) Follicular adenocarcinoma metastasis to lumbar vertebra. (H.E).