Solitary Vertebral Column Metastasis from Occult Sclerosing Carcinoma of the Thyroid Gland:
Report of a Case

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ABSTRACT

Patchefsky, Arthur S., Keller, I. B., and Mansfield, Carl M.: Solitary vertebral column metastasis from occult sclerosing carcinoma of the thyroid gland. Report of a case. Amer. J. Clin. Path. 53: 596–601, 1970. The case of a 54-year-old man with carcinoma of the thyroid gland metastatic to the vertebral column is reported. Serial sectioning following total thyroidectomy revealed a 0.85-mm., occult, sclerosing carcinoma and a 3-mm. Hürthle-cell adenoma. The literature is reviewed; no previous case of a minute, occult, sclerosing carcinoma of the thyroid gland presenting as a blood-borne metastasis has been found.

It is well established that small, non-palpable thyroid cancers can produce metastases. Hazard and Woolner and associates have shown that 23 and 43% of their cases of occult carcinoma, respectively, metastasized to cervical lymph nodes. Such metastases from thyroid carcinomas less than 1 mm. in diameter have been reported. The smallest of these primary tumors thus far have been 0.6 mm. and 0.7 mm. in diameter. Occult thyroid carcinomas manifest primarily as blood-borne metastases without cervical lymph node involvement are rare. The finding of a 0.85-mm. occult sclerosing carcinoma of the thyroid gland presenting as a solitary vertebral column metastasis is the subject of this case report.

Report of a Case

A 54-year-old Caucasian man was first seen at Jefferson Medical College Hospital...

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in September 1967 because of left flank pain of one year's duration. Roentgenograms of the spine revealed destruction of the pedicle of the T-11 vertebra, with an adjacent soft-tissue mass. Extensive laboratory tests and roentgenograms, including complete bone survey, roentgenogram of the chest, intravenous pyelogram, upper gastrointestinal series, and barium enema, were unremarkable; a scintiscan of the liver was also unremarkable. A myelogram showed an extradural tumor with a complete block to the cranial flow of the contrast material at the level of T-11 and T-12 (Fig. 1).

On December 19, 1968, a laminectomy of T-10 to T-12 vertebrae revealed an epidural mass, with destruction of the pedicle and lamina of T-11. Microscopically, the tumor was composed of nests of cells surrounded by a prominent sinusoidal vascular network (Fig. 2). Solid areas and foci of poorly-formed acinar and papillary structures were identified (Fig. 3). There was no calcification nor were colloid-containing acini seen. No mitoses were present. The diagnosis was poorly-differentiated metastatic carcinoma. Four thousand rads of supravoltage therapy were administered to the spine. The patient was readmitted to the hospital in January 1969 because of recurrent pain in the back. Roentgenograms of the spine revealed destruction of the pedicle of T-12 along with the previously-noted changes at T-11, suggestive of recurrent tumor. Other roentgenographic studies were repeated, including complete bone survey, roentgenogram of the chest,
intravenous pyelogram, upper gastrointestinal series, and barium enema. These were all unremarkable, as was a scintiscan of the liver. However, a scintiscan of the thyroid gland following administration of $^{131}$I revealed heavy isotope uptake in the region of T-11, but not at T-10 or T-12, the field of the previous laminectomy (Fig. 4). This suggested uptake by the metastatic tumor, rather than spurious uptake as the result of surgical trauma. The thyroid scan itself was unremarkable and no activity was present in the neck outside the thyroid gland. This study was repeated twice, each time with the same result. A primary carcinoma of the thyroid gland was strongly suspected, and on April 1, 1969, a total thyroidectomy was performed.

Grossly, each lobe of the thyroid measured approximately 5 by 2 by 0.5 cm., and each weighed approximately 7 Gm. The fresh specimen was cut at 3 to 4 mm. intervals and totally embedded. A single 3-mm., discrete, soft, fleshy nodule was found in the right lobe. Microscopically, this nodule was well demarcated from the surrounding thyroid tissue and showed no evidence of invasion (Fig. 5). The predominant pattern was follicular, with no papillary foci. The cytoplasm of the cells was deeply eosinophilic, with Hürthle-cell features. No psammoma bodies or mitoses were found. Another block from the right lobe showed a 0.85-mm. tumor near the surface of the thyroid, beneath the capsule. It evoked a prominent sclerotic response in the surrounding stroma, giving the entire lesion a puckered appearance (Fig. 6). The nodule was composed of infiltrating follicles, with rare papillary projections (Fig. 7). The nuclei varied slightly in size and shape. They were irregular and more vesicular than the nuclei of the surrounding normal thyroid cells. The tumor was in close proximity to capsular blood vessels and tumor could be seen adjacent to a thin-walled venule (Fig. 8). The remainder of the thyroid gland was sectioned serially and each tenth slide stained. No other lesions were identified. The pathologic diagnosis was Hürthle-cell adenoma (3 mm.), and occult sclerosing carcinoma (0.85 mm.).

Discussion

Graham and later, Hazard and associates, called attention to "non-encapsulated sclerosing tumor of the thyroid." They concluded from their data that these were
innocuous and did not metastasize. Klinck and Winship showed that these lesions were capable of metastasizing to the lymph nodes of the neck in 31% of their cases and renamed them occult sclerosing carcinoma. Other authors have shown a similar incidence of cervical lymph node metastasis from microscopic carcinoma of the thyroid gland, although distant metastases have been unusual.

The present case illustrates a solitary distant metastasis from an occult sclerosing carcinoma of the thyroid gland. Progression of the spinal lesion was extremely slow; symptoms referable to it were present for a year before laminectomy and biopsy. Furthermore, the extent of metastatic disease remained stationary and no other metastatic foci developed over a 16-month period from the time the epidural mass was first biopsied.

The fortuitous finding that the metastatic deposit in the vertebral column produced a positive uptake of radioactive iodine (131I) on scintiscan made the thyroid gland suspect as the site of the primary tumor. Subsequent total thyroidectomy showed two separate and independent lesions, a 3-mm. Hurthle-cell adenoma and a 0.85-mm. occult sclerosing carcinoma. The occult sclerosing carcinoma was only 0.85 mm. in diameter, and by its size alone would not seem potentially serious. However, it was intimately associated with vascular channels, which would enable a primary carcinoma this minute to metastasize readily. Although the Hurthle-cell adenoma was larger, it showed no evidence of invasion and no papillary areas or other morphologic evidence of malignancy. Furthermore, the metastatic focus showed no evidence of Hurthle-cell change. Therefore, it is not likely that this was the primary lesion that gave rise to the metastatic deposit in the vertebral column. The absence of demonstrable lymph-node metastases and the initial site of presentation in the vertebral column indicated early blood-borne metastasis, possibly via the vertebral veins.

We have found no comparable case of a minute occult sclerosing carcinoma presenting primarily as a blood-borne metastatic lesion. Sillephant and co-workers included from the Armed Forces Institute of Pathology a case of occult sclerosing carcinoma which metastasized to the heart and caused the death of the patient. However, the size of the primary tumor was not given nor was it stated whether local metastases were present in the neck. It is possible, however, that this case also represents initial blood-borne metastasis from an occult sclerosing carcinoma.

The present case well illustrates the malignant potential of occult, microscopic carcinoma of the thyroid gland. We suggest, therefore, that metastatic deposits in which no primary tumor can be found be subjected to a scintiscan with radioactive iodine (131I). If there is uptake of the isotope, total thyroidectomy should be considered even when there is no clinical or radiologic evidence of abnormality within the thyroid gland. The likelihood that such metastatic lesions might take up radioactive iodine (131I) and so be successfully treated justifies this approach to their identification.

References