

# CARCINOMA OF THE THYROID GLAND APPARENTLY IN STRUMA FIBROSA (RIEDEL)

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THE differential diagnosis between Riedel's struma and carcinoma of the thyroid gland is often difficult because of their common features of mass, pressure, and infiltration of structures adjoining the thyroid gland. The occurrence of the combined lesion is a rarity despite the fact that adenomas are not uncommon in struma fibrosa. A case was recently encountered which presented clinical features consistent with either diagnosis and the unusual pathologic findings of a sclerosing lesion of the thyroid gland and an undifferentiated carcinoma.

## Case Report

A married white woman, aged 38, was first admitted to the Cleveland Clinic on August 13, 1930, complaining of enlargement of the neck. She had first noticed slight enlargement seven years previously, and six years before admission a nodular enlargement of the thyroid gland, greater on the left, had been noted by her physician. The enlargement was described as the size of a goose egg. The thyroid mass was believed to resemble carcinoma, and removal was advised. However, operation was not performed, and the mass gradually increased in size. There had been no nervousness, palpitation, or tenderness.

Temperature was 98.2 F., pulse rate 72, blood pressure 110 systolic, 80 diastolic. Physical examination revealed the left lobe of the thyroid gland to be enlarged, firm, nodular, and freely movable. Otherwise the physical examination did not reveal abnormalities. The red cell count was 4,400,000, hemoglobin 80 per cent, white cell count 6700.

The diagnosis was adenomatous goiter without hyperthyroidism. Thyroidectomy was advised but was not performed.

The patient next returned on May 17, 1947. In 1931 she had had a right salpingo-oophorectomy for a twisted ovarian cyst and in 1933 dermatitis venenata due to mercolized wax. She had moved from Ohio to New York, and, while there, the goiter had disappeared.

About four months before entry the swelling returned. There was no local soreness, but the patient occasionally experienced some pain behind the left ear. There had been no difficulty in breathing or swallowing, no nervousness, and her appetite had been good. The skin on the arms and legs had become very dry during the preceding one and a half years. She tolerated hot weather better than cold.

The temperature was 98.6 F., pulse rate 76, respirations 20, blood pressure 150 systolic, 90 diastolic. Weight was 133 pounds, her normal weight being 137 pounds. The left lobe of the thyroid gland was stony hard, fixed, and enlarged about four times normal size. The gland moved slightly with swallowing.

Hemoglobin was 13 Gm. per cent and the white cell count 3900. Blood Wassermann and Kahn reactions were negative.

Röntgenologic examination of the chest revealed normal lungs. The trachea was deviated to the right and compressed along the anterior margin by an enlarged left lobe of the thyroid gland. On the oblique film there was a small area suggesting calcification in

the region of the left lobe. The diagnosis was carcinoma of the thyroid gland; Riedel's struma could not be entirely excluded.

A left lobectomy was performed on May 19, 1947, after biopsy and microscopic examination. The left lobe was stony hard, seemed to be fibrous, and the muscular capsule adhered to it.

### Pathologic Examination

The gross specimen was 25 by 12 by 10 mm. and composed of firm, tough, opaque, yellowish-pink tissue, in part covered by tissue tags. Diagnosis was malignant tumor, possibly fibrosarcoma; Riedel's struma could not be ruled out.

The second specimen consisted of a thyroid lobe of roughly ovoid shape, 65 by 50 by 45 mm., weighing 97 Gm., accompanied by several flat portions of firm, tough, white tissue. The surface was pinkish-yellow with numerous tags of tissue attached over one area. Section revealed an eccentric ovoid grayish area, 45 mm. in diameter, surrounded by a white area 5 to 20 mm. in thickness. The latter zone was made up of tough, white, very firm tissue with

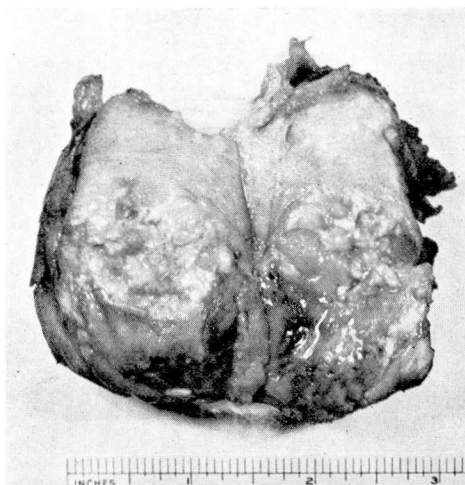


FIG. 1. Sectioned thyroid lobe, showing the somewhat circumscribed bulging area of undifferentiated carcinoma, and peripheral, dense, sclerotic zone.

a finely grained and, in part, laminated appearance. The central ovoid area was formed by soft, gray to purplish-gray tissue, with a slightly bulging surface and a fish-flesh appearance. There was one large zone of yellowish color, apparently necrotic. Several hard patches were present. (Fig. 1)

On microscopic examination sections from the rounded central zone revealed atypical epithelial cells in variable arrangement and of greatly varying type; irregular sheet-like masses with cells of rather large size and with occasional giant nuclei; scirrhous zones with sparsely distributed single small islands and cords of medium-sized atypical epithelial cells; trabeculations of spindly and polyhedral epithelial cells separated by blood-filled sinuses, and occasional patches of hyaline fibrosis. There were frequent mitoses. Broad zones of necrosis and calcification were present in some sections. A well retained fibrous capsule adjoined the neoplasm in areas. Two veins in the capsule of one section were partly filled with tumor.

The broad peripheral sclerotic zone was formed in large part by dense, often hyaline, fibrous tissue containing scattered small acinar structures, some of which contained colloid and were formed by flat or cuboidal epithelium. Occasional giant cells of foreign body type

were present. There were other areas of greater cellularity blending with the above zones and resembling cellular fibrous tissue. Several blood vessels showed rather marked fibrous thickening of their walls. There were frequent foci and patches of lymphocytes, plasma cells, and some polymorphonuclears. Sections through the periphery showed infiltration of muscle by spindle cells and dense collagenous tissue. Rare cells in some sections presented irregular atypical nuclei. In phosphotungstic acid hematoxylin preparations, fibrogliia were demonstrated in most of the units of the cellular spindle cell patches.

The pathologic diagnosis was undifferentiated carcinoma, medullary and spindle cell types, in Riedel's struma. (Figs. 2 and 3)

Following operation, radiation therapy was given. After 2400 r the patient showed such a severe reaction to therapy that treatment was terminated.

The patient was admitted to the hospital on October 8, 1947, because of paralysis of

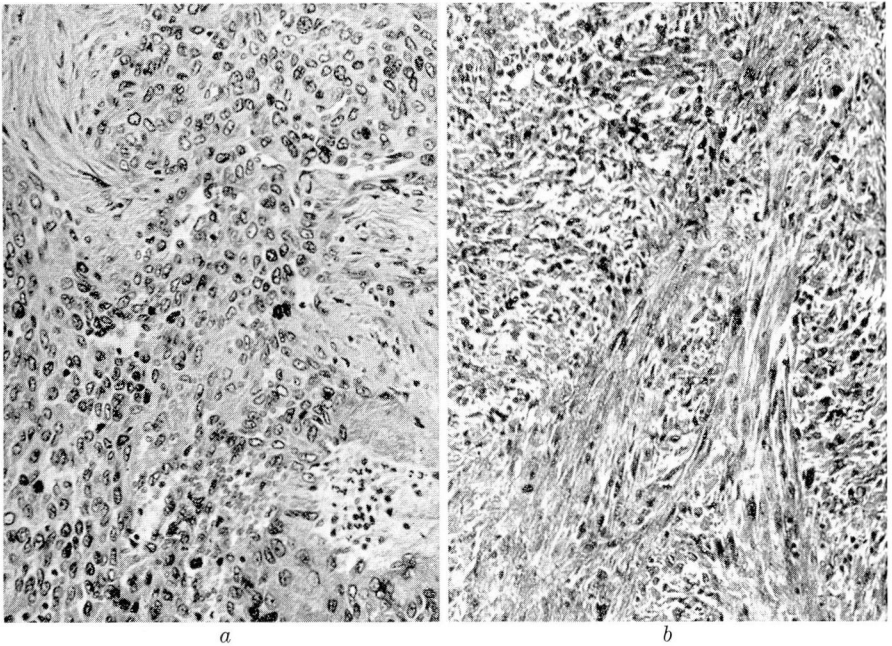


FIG. 2. Photomicrograph of undifferentiated neoplasm (x150). (a) Medullary type. (b) Spindle cell type.

the lower extremities. The thyroid was stony hard and three times normal size. Roentgenologic examination of the chest revealed multiple nodular shadows, which were interpreted as metastases. No lesions were demonstrated elsewhere.

### Discussion

In order to explain the extensive fibrosis, two pathologic diagnoses were considered, diffuse scirrhous carcinoma alone or carcinoma arising in Riedel's struma. Over large areas in the peripheral zone, the sclerosed thyroid gland with remnants of atrophic follicles and patches of lymphocyte and plasma cell infiltration presented an histologic picture typical of Riedel's struma. In the cellular spindle cell foci in the thyroid tissue and peripherally the majority

of cells were identified as fibroblasts in the phosphotungstic acid hematoxylin preparations. In some sections, however, there were rare cells with atypical nuclei and without demonstrable fibroglia. The more central lesion was typically carcinomatous, with medullary masses of poorly differentiated cells and vascular spindle cell areas. The calcification was interpreted as probably resulting from a precedent adenoma. In some sections the cellular zones at the periphery were of neoplastic appearance, yet they were predominantly of fibroblastic composition, in immediate association with dense sclerotic patches and with foci of infiltration by lymphocytes and plasma cells. Though the histologic picture in the peripheral zone coincides with that found in Riedel's

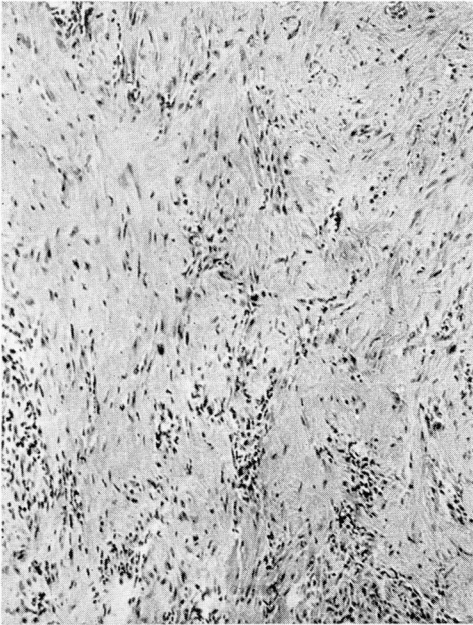


FIG. 3. Photomicrograph of peripheral sclerotic zone, showing dense collagenous connective tissue with atrophic thyroid follicles and patchy infiltration, principally by lymphocytes and plasma cells (x70).

struma, it is difficult to prove absolutely that this lesion was pre-existent, since an infiltrating desmoplastic tumor might itself produce such fibrosis. In our experience, however, an infiltrating neoplasm with such a sparsity of neoplastic units and such an abundance of dense hyaline stroma has not been encountered in the thyroid.

The occurrence of carcinoma arising in Riedel's struma is an expected possibility, considering that a fair percentage, variously estimated from 60 to 90 per cent, of adenocarcinomas of the thyroid gland originate in adenomas and the fact that adenomas are not uncommonly found in struma fibrosa. In a recent review at the Cleveland Clinic nine of fifteen specimens of the latter

lesion contained adenomas, and Eisen<sup>1</sup> reports four of seven instances. However, the rarity of Riedel's struma and the relative rarity of thyroid carcinoma offer an explanation for the lack of coincidence of the lesions. There is also a difficulty in establishing the presence of other lesions in a gland that is the seat of extensive carcinoma; the landmarks of preceding disease may be obliterated by the malignant lesion. Whatever the particular circumstances, a partial but rather extensive search of the literature has failed to reveal a reported case of the combined lesion.

This case illustrates several interesting clinical features. The presence of calcification or suspected calcification does not exclude carcinoma, although calcium is not commonly demonstrated in malignant neoplasms of the thyroid. Pain due to enlargement of the thyroid gland in both Riedel's struma and carcinoma is often referred to the ear or neck on the side of involvement. The neoplasm encountered in this case belongs to the most malignant group of thyroid carcinomas, being histologically atypical and showing readily demonstrable invasion of veins. The spindle cell variants of undifferentiated carcinoma of the thyroid gland frequently show rapid recurrence. This is well illustrated in an unusual case reported by Wikle and Ritzman<sup>2</sup> in which a massive local recurrence was found within four months of the primary excision and by this case, which showed recurrence and metastasis within five months. Radio-resistance is a common feature of this type of undifferentiated thyroid neoplasm.

#### References

1. Eisen, D.: Riedel's struma. *Am. J. M. Sc.* **192**:673-688 (Nov.) 1936.
2. Wikle, H. T., and Ritzman, A. J.: Course of carcinoma of thyroid gland; report of unusual case. *Am. J. Surg.* **56**:507-512 (May) 1942.