

Sarcoma of the thyroid region mimicking Riedel's thyroiditis

A Torres-Montaner, M Beltrán, A Romero de la Osa, H Oliva

Abstract

Because sarcomas of the anterior lower neck region occur so infrequently, they are not usually considered in the differential diagnosis of Riedel's thyroiditis. Riedel's thyroiditis itself may be confused on clinical grounds alone with malignant neoplasms because of its invasive features. Sarcomatoid carcinoma is the main entity to be discarded in this regard. This is accomplished through histological examination by the finding of carcinomatous areas and/or reactivity with epithelial markers. These features also set apart sarcomatoid carcinoma from true sarcomas. This report concerns a patient with a sarcoma of the anterior lower neck region which was initially suspected to be Riedel's thyroiditis or sarcomatoid carcinoma on clinical and radiological grounds. A peroperative biopsy was interpreted by two independent pathologists as consistent with Riedel's thyroiditis. The subsequent clinical course and postmortem examination demonstrated a high grade sarcoma with metastasis to both lungs and the pleura, and invasion of adjacent neck structures. Nevertheless, some areas of the postmortem material showed a microscopic pattern similar to mediastinal fibrosis, raising the possibility of the malignant transformation of a fibrosclerotic lesion.

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On 1 August 1994, a 65 year old white man was referred to our hospital with hoarseness of six months duration. The patient was also found to have stridor and dyspnea related to exercise. There was no antecedent of radiotherapy or thyroid pathology and past medical history was unremarkable except for chronic bronchitis.

Scintigraphic study showed no uptake of tracer in the right thyroid lobe, isthmus, and lower pole of left lobe, which was coincident with a palpable mass at the same level.

A computer assisted tomography scan revealed diffuse enlargement of the thyroid gland, which was more conspicuous in the right lobe and caused displacement, compression, and stenosis of the trachea. Displacement of the carotid sheath on the right and endothoracic growth were noted. Ultrasonography showed diffuse enlargement without nodularity.

A barium swallow detected stenosis and displacement of the oesophagus. Indirect laryngoscopy revealed limitation of vocal cord

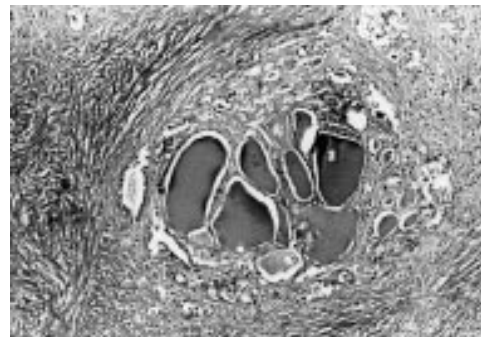


Figure 1 Residual thyroid follicles enmeshed in fibrotic tissue with disseminated inflammatory cells. Magnification, $\times 10$.

movements and paralysis of the right vocal cord. Laryngeal and oesophageal mucosa were normal and the skin was not involved. The only abnormal laboratory test result was an erythrocyte sedimentation rate of 65 in the first hour.

At surgery, a large fibrous mass of stony hard consistency was found firmly adherent to the trachea and invading the skeletal muscles and right carotid sheath. Remnants of the thyroid gland could be identified on the left side only. Resection was not possible. Biopsies from both sides of the mass overlying the trachea were taken, and tracheal intubation was performed. Peroperative biopsy was interpreted as consistent with Riedel's thyroiditis. Microscopic examination of the frozen and subsequently fixed tissue (fig 1) showed dense interstitial fibrosis with a lymphoplasmacytic infiltrate and atrophic thyroid follicles. Occlusive phlebitis was present in some areas.

Skeletal muscle was infiltrated by the fibrotic proliferation. There was no evidence of malignancy, although some atypical nuclei were seen later when the block was repeatedly sectioned.

The patient was discharged on 18 August 1994. On 23 November he was admitted again with dyspnea, abundant secretions through the tracheostomy orifice, glottic oedema, and tracheal stenosis below this orifice.

Exploratory results were interpreted as an inflammatory process with abscess formation as a result of bacterial infection and/or aerodigestive fistula. He died suddenly in December and permission for a necropsy was granted. Postmortem examination showed a stony hard mass encircling the trachea, oesophagus, right carotid artery, and the neck muscles. The skin was not involved. There were multiple nodules of fibrotic appearance in both pleural surfaces (right and left) and similar nodules (although less numerous) in the lungs. A blood clot about 3 cm in diameter at the periphery of the lung

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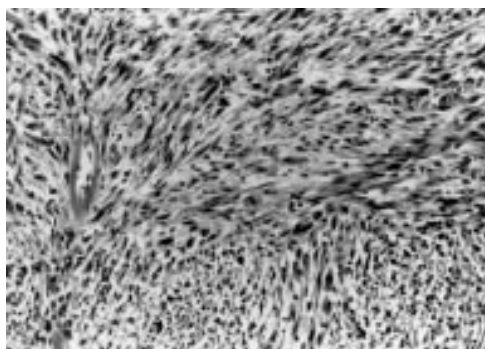


Figure 2 Intersecting bundles of atypical spindle cells. Magnification, $\times 20$.

reached the adjacent pericardial sac. No fibrosclerotic lesions or other alterations were found in other anatomical sites.

Multiple histological sections taken from the neck, lungs, and pleura showed a spindle cell proliferation (fig 2) with some atypical giant cells and mitotic activity varying widely in different sections. In the lung, spindle cells were seen growing in air spaces without damaging the alveolar walls. Interestingly, a different pattern, typical of mediastinal fibrosis, was seen in some of the sections—in the area surrounding the right carotid. A sample of this area was taken for electron microscopic study and found to comprise fibroblasts and a few myofibroblasts without atypical features. Immunophenotyping, after heat epitope retrieval, yielded the following results: keratin cocktail (–), cytokeratin 5.2 (–) (these epithelial markers were tested repeatedly in different sections), vimentin (++++), desmin (–), actin (–), S-100 protein (–), HMBE-1 (a gift from Dr H Battifora, City of Hope National Medical Center, California, USA) (–), Kp-1 (+++) , Ki-67 (nearly 0%), chromogranin (–), calcitonin (–), thyroglobulin (–), CD34 (–). Congo red staining was also negative.

Discussion

Riedel's thyroiditis is often suspected on clinical grounds of being an undifferentiated carcinoma. However, when surgical exploration is performed the finding of a hard fibrous mass replacing the thyroid, firmly adherent to surrounding planes, and a microscopic pattern of interstitial fibrosis with a lymphoplasmacytic infiltrate and atrophic thyroid follicles establishes a definite diagnosis. Our present case was consistent with Riedel's thyroiditis on clinical and radiological grounds, although perhaps with an even stronger invasive tendency, and this confusion was fostered by the microscopic pattern of tissue taken for peroperative diagnosis. However, the subsequent clinical course and the postmortem study demonstrated a malignant tumour.

Immunophenotyping and histological study of this tumour ruled out several entities that must be considered in the differential diagnosis. The absence of reactivity for keratin of high and low molecular weight in all cells is inconsistent with a diagnosis of sarcomatoid carcinoma. Furthermore, several sections from different areas were negative. Nonetheless, the

paucicellular variant of thyroid anaplastic carcinoma could create confusion either with a sarcoma or Riedel's thyroiditis.¹ However, apart from being positive for epithelial markers, this tumour is paucicellular with reactive fibrosis and lacks the uniform proliferation of spindle cells seen in most microscopic fields in our present case. A pattern of diffuse sclerosis and fibromatosis-like areas may be seen along with malignant elements in anaplastic carcinomas of follicular, papillary, or medullary origin. Some of these tumours also contain spindle and giant cells.^{2,3} Scarring is also a feature of some papillary carcinomas⁴ that behave in an indolent fashion, even though they may give rise in time to more aggressive lesions. Serial sectioning of these tumours reveals epithelial structures and/or amyloid formation, and immunophenotyping shows positivity for epithelial and/or neuroendocrine markers. Other tumour types that can have a spindle cell component—such as some thymic carcinoids, spindle cell thymomas, and synovial sarcomas—are also reactive with epithelial markers.⁵ On the contrary, the uniform, atypical proliferation of spindle cells seen in our case was consistently negative in multiple sections. The diagnosis of desmoplastic mesothelioma can be discarded because of negativity to the mesothelial marker HMBE-1,⁶ as well as negativity to keratin. A possible diagnosis would be fibrosarcoma, but the presence of giant cells is not in keeping with this diagnosis. This fact, together with the intense reactivity for the histiocyte marker CD68 (Kp-1 antibody), suggests that the tumour was a malignant fibrous histiocytoma. Some histological features of this lesion, such as the invasion of air spaces with preservation of the alveolar walls, are similar to a sarcoma of myofibroblasts reported by d'Andiran and Gabiani,⁷ although our case was not positive for actin. The most serious difficulty lies in the differential diagnosis from malignant spindle cell tumour of the pleura (malignant solitary fibrous tumour), not because of pleural involvement, which occurred late in the disease process, but because this tumour can also develop in extrapleural locations.⁸ Morphologically, solid spindle and diffuse sclerotic areas coexist in this tumour and the spindle cell component closely resembles that seen in fibrosarcoma. In some cases, cellular pleomorphism, bizarre fibrohistiocytic-type giant cells, and increased mitotic activity lead to a pattern indistinguishable from malignant fibrous histiocytoma.⁵ The immunohistochemical profile of this tumour is very similar to that seen in our case—it is negative for epithelial markers, desmin, S-100, and actin, but positive for vimentin.⁵ More recently, CD34 reactivity was demonstrated in all cases of a series of this tumour type.⁸ Therefore, the lack of CD34 and CD68 positivity supports the diagnosis of malignant fibrous histiocytoma in our case. In the series of anaplastic thyroid carcinomas reported by Carcangiu *et al*,⁹ 52% of cases displayed a spindle cell pattern singly or in combination, very similar to malignant fibrous histiocytoma. Sclerohialin and necrotic areas

were also a feature, and in some of these tumours neither epithelial structures nor epithelial markers were found. The authors raised the question of whether the designation of anaplastic carcinoma or sarcoma should be applied to these tumours. Our finding of CD68 reactivity in some spindle cells suggests that some anaplastic spindle cell tumours may indeed belong in the category of malignant fibrous histiocytoma, although this point has no relevance to prognosis. An interesting finding in some of the sections taken at postmortem examination was a histological pattern typical of mediastinal fibrosis. Coupled with the initial impression obtained in the peroperative biopsy, these data suggest the possibility of a malignant transformation of a fibrosclerotic lesion. However, this is unlikely for the following reasons: (1) Only two cases of fatal evolution of Riedel's thyroiditis have been reported and neither was associated with malignant transformation, even though some atypical cytological features were reported and could be seen in the published microphotograph of one.¹⁰ (2) There was a rapid fatal outcome in our patient (although a fibrosclerotic lesion might have gone unnoticed for some time because of the robust neck of the patient). (3) Our initial impression of Riedel's thyroiditis might be explained by the presence of sclerotic areas in some sarcomas as pointed out above.

Note added in proof

After this paper was accepted for publication we had the opportunity to study a case of thyroid carcinoma containing a sarcomatoid component, which seemed to originate in a medullary carcinoma that could be recognised in

neighbouring areas. We performed immunohistochemical staining for CD68 in the sarcomatoid areas and detected some positive cells. Therefore, the presence of CD68 positive cells does not warrant a diagnosis of malignant fibrous histiocytoma as we had believed previously. These cells apparently can arise through dedifferentiation of medullary carcinoma cells. The view of Carcangiu *et al*, who consider all anaplastic and sarcomatoid thyroid tumours to be of epithelial origin, seems to be correct. It remains to be seen whether a sarcomatoid pattern and CD68 reactivity are associated only with medullary carcinomas.

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