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CASE REPORT

Primary squamous cell carcinoma of the thyroid years after radioactive iodine treatment

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ABSTRACT

Primary squamous cell carcinoma (SCC) of the thyroid gland is a rare diagnosis, since there is no squamous epithelium in the thyroid gland. SCC of the thyroid is highly aggressive with a poor prognosis. We present a case of primary SCC of the thyroid: this 88-year-old male patient had a history of hyperthyroidism which was treated with radioactive iodine 25 years earlier. Whether this treatment could be related to SCC of the thyroid is not clear. We treated our patient with thyroidectomy and subsequent intensified radiotherapy. Six months after treatment our patient is doing well and there is no sign of local reoccurrence. Our work-up is described, including the differentiation from metastatic disease. The origin of squamous cell carcinoma in the thyroid is uncertain; we discuss some theoretical considerations. We conclude that after excluding metastatic disease, thyroidectomy combined with radiotherapy is the treatment of choice.

KEYWORDS

Thyroid carcinoma, squamous cell carcinoma, treatment

INTRODUCTION

Primary squamous cell carcinoma (SCC) originating in the thyroid gland is very rare, since there is no squamous epithelium in the thyroid gland.[1] When SCC is found in the thyroid gland the first consideration is metastasis of another primary site. Still, there are some exceptional situations where squamous cells can be seen in thyroid tissue, for instance such as embryological remnants, in inflammatory processes and cancers. Until now there have been approximately 150 cases of primary SCC reported in the English literature. In most cases it behaves aggressively, clinically identical to undifferentiated thyroid cancer with poor outcome.[2] We report a patient with primary SCC of the thyroid, 25 years after treatment with radioactive iodine.

CASE

An 88-year-old man presented with a swelling in the neck at our outpatient clinic. He had noticed this swelling for a few days and it had been rapidly increasing in size. His previous medical history revealed hyperthyroidism 25 years ago, due to a toxic nodule of the right thyroid gland. The patient was treated with radioactive iodine with subsequent hypothyroidism. Furthermore, he had hypertension and chronic renal failure, with an MDRD of 33 ml/min. The swelling in his neck gave rise to dyspnoea and dysphagia. His weight was stable and he had no history of smoking. On physical examination his blood pressure was 140/70 mmHg with a pulse rate of 70 beats/min. A hard mass of 4 x 3 cm was palpable in the region of the left thyroid gland without detectable lymph nodes in the neck or elsewhere. Examination of heart, lungs and abdomen was normal. Ultrasound examination of the thyroid gland showed multiple small nodules on both sides, and in the left thyroid gland there was a large nodule of 4 x 2.5 cm in diameter, partially solid and partially cystic. Fine needle aspiration (FNA) of this nodule was performed. Cytological examination showed squamous cell carcinoma. At this time metastatic disease from another primary location was considered. CT scan of the lungs, MRI of the head and neck region, laryngoscopy, oesophagogastroduodenoscopy and positron emission tomography combined with computer tomography of the total body did not reveal another primary tumour. A thyroidectomy was

performed and pathological examination showed a poorly differentiated SCC with a diameter of 4.5 cm with dubious infiltration of the thyroid capsule and no lymph node metastasis (T3N0M0). There were no signs of follicular carcinoma, papillary carcinoma or muco-epidermoid carcinoma. It was concluded that this 88-year-old male patient had a primary squamous cell carcinoma of the left thyroid gland.

CYTOLOGICAL AND HISTOLOGICAL EXAMINATION

FNA showed atypical squamous cells with keratinisation in a background of necrosis with polymorphonuclear leucocytes (*figure 1A*), suggestive of squamous cell carcinoma. Histology showed fields of atypical squamous cells with mitosis (*figure 1B*). There was no evidence of associated papillary carcinoma, follicular carcinoma, anaplastic carcinoma, follicular adenoma, muco-epidermoid carcinoma or squamous metaplasia in colloidal nodules.

Figure 1A. *Cytology of thyroid gland, Giemsa staining, shows two atypical squamous cells (arrows)*

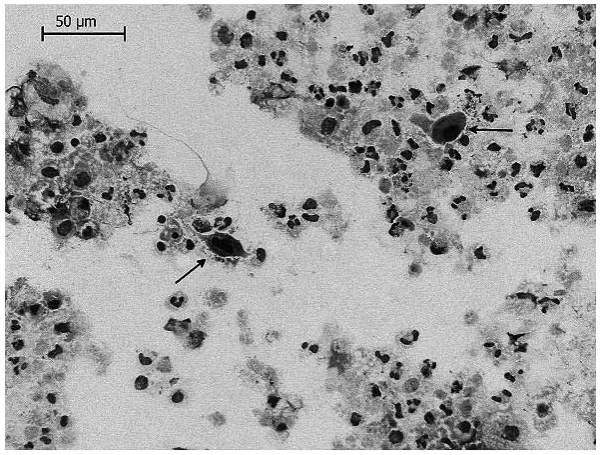
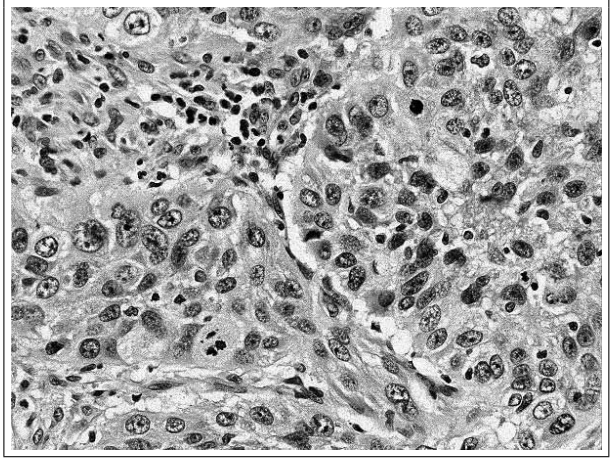


Figure 1B. *Histology of thyroid gland, fields of atypical squamous cells with mitosis*



DISCUSSION

This case represents a rare form of thyroid cancer, namely squamous cell carcinoma. In a histological review of 600 primary thyroid carcinomas, primary SCC accounted for 0.7%.[3]

In our region of the Netherlands, consisting of approximately two million citizens, there were 532 cases of thyroid carcinoma during the years 1998-2007. Only one case of SCC was reported in this period. We calculated that SCC accounts for 0.38% of all cases of thyroid carcinoma. The proportion of papillary, follicular, medullary and anaplastic cancer was 67.5, 22.0, 3.5 and 5.1%, respectively.[3] The origin of SCC in the thyroid is uncertain, but there are some theoretical considerations. Some reports suggest that squamous cells can be derived from embryonic remnants such as the thyroglossal duct or an ultimobranchial body. Another theory is that thyroiditis or inflammation may trigger metaplasia of follicular epithelial cells. Squamous metaplasia can also be seen in papillary, follicular, medullary and anaplastic thyroid carcinomas.[5,6] Our patient had no other type of thyroid cancer on pathological examination. Interesting to note is that our patient had a history of hyperthyroidism which was treated with radioactive iodine 25 years earlier. Whether these could be related to each other is not clear. There are some case reports suggesting that there might be a relationship between radioactive iodine and anaplastic carcinoma.[7,8] No reports have been published in the literature suggesting a relationship between radioactive iodine treatment and SCC of the thyroid. The behaviour of SCC of the thyroid is aggressive. It is a fast growing tumour with poor outcome, with a mean survival of 8.6 months.[9] The treatment is similar to the treatment of anaplastic carcinoma and consists of thyroidectomy and radiotherapy.[10,11] We treated our patient with thyroidectomy and subsequent intensified radiotherapy, 35 sessions of 2 gray. Six months after treatment our patient is doing well and there is no sign of local reoccurrence.

CONCLUSION

In case of SCC of the thyroid, it is important to rule out other primary sites of SCC with a fast and thorough work-up, since SCC of the thyroid is highly aggressive

and has an extremely poor prognosis. After excluding metastatic disease, thyroidectomy combined with radiotherapy is the treatment of choice.

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