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Primary squamous cell carcinoma of the thyroid: Case report and systematic review of the literature

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ABSTRACT

BACKGROUND: Primary squamous cell cancer (PSCC) of thyroid is a rare malignancy with poor prognosis. It is mandatory to exclude secondary involvement of the thyroid by panendoscopy, CT-scan and immunohistochemical analysis. As treatment surgery, radiation and rarely chemotherapy is employed.
METHODS: A systematic review of the literature was conducted searching medline and embase database using the medical subject headings "primary squamous cell carcinoma of thyroid" and "primary squamous cell cancer of thyroid", for articles published until April 2016 (n = 1733). Of interest were the used treatment modalities and survival outcomes.
RESULTS: A total of 35 publications reporting on 50 cases including ours were finally analyzed. A curative treatment approach was described in 24 patients (48%). Additional radiotherapy, chemotherapy or radiochemotherapy was applied in 17, 7 and 7 patients respectively. Median overall survival was 6 months [range 0–48] for 47 patients. Disease free survival was only achieved in 8 patients with disease limited to the thyroid gland, complete surgical resection and additional radiotherapy or radiochemotherapy [reported median 20 months; range 12–48].
CONCLUSION: Reported disease free survival of PSCC of the thyroid was only achieved in patients with complete surgical resection in combination with adjuvant radio- and/or chemotherapy. However long term survival has not been reported in the literature yet.

1. Introduction

Primary squamous cell carcinoma (PSCC) of the thyroid is a rare neoplasm and constitutes less than one per cent of all primary thyroid carcinomas [1]. It can occur at any age but the median age of presentation is the fifth and sixth decade [2]. It is usually diagnosed as advanced disease with infiltration in adjacent organs or as an incidentaloma with poor prognosis. It is crucial to exclude any metastatic disease, direct extension from an extra-thyroidal primary tumor and the association with a tall cell variant of papillary carcinoma of the thyroid before making the diagnosis as this has impact on potential treatment [3]. Therefore mandatory tools for the diagnosis of primary squamous cell carcinoma of the thyroid are panendoscopy, CT-Scan or PET-CT and immunohistological analysis [4]. The ideal potentially curative treatment has not been ruled out yet. Currently, there are different treatment option described which include surgery, chemotherapy and radiation [5]. Additionally, the value of lymphadenectomy has not been further investigated for the patientís outcome.

2. Methods

The following case report was presented according to the SCARE guidelines [6]. Additionally a systematic review of the literature was conducted searching medline and embase database using the medical subject headings "primary squamous cell carcinoma of thyroid" and "primary squamous cell cancer of thyroid", for articles published until March 2016. All English written publications reporting on primary squamous cell carcinoma of the thyroid were included. Complete diagnostic work up including immunohistochemistry, CT-Scan and panendoscopy to exclude secondary squamous cell cancer of the thyroid were mandatory. Cases were also included by the diagnosis of an autopsy study, which showed no other source of squamous cell carcinoma than the thyroid. We excluded following cases:

- cases of secondary disease to the thyroid
- cases which have been diagnosed only by fine needle aspiration cytology (FNAC)

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- cases in which SCC was present in association with other thyroid malignancies
- such as papillary carcinoma, adenocarcinoma or anaplastic carcinoma
- cases in which complete diagnostic work-up as CT-scan, panendoscopy and immunohistochemistry was not performed
- double citations

The objectives of this review were the evaluation of the assessment of local and distant tumor extension, described treatment options (surgery, radiotherapy, chemotherapy), number of patients with curative intended treatment and the outcome parameters recurrence, disease free and overall survival with respect to additional radiotherapy and/or chemotherapy. A curative intended treatment was assumed when a complete (R0) resection was achieved.

3. Case presentation

3.1. Patient history and treatment

A 61- year old female patient with the history of a hashimoto thyreoiditis was admitted at our hospital because of a clinically visible single thyroid nodule in the left lobe. Cervical sonography revealed a total thyroid volume of 11.7 ml with a single hypoechogenic nodule of 2.5 × 2.1 × 2.4 cm, displaying an irregular ventral contour. A scintigraphy showed the nodule to be hypofunctional. Additionally the patient had diagnosed a non-classified collagenosis with fibrosis of the lung. The operation was initiated as a hemithyreoidectomy left. After the diagnosis of a squamous cell carcinoma in the frozen section biopsy the operation was completed as a total thyroidectomy. Because of sonographic unsuspicious cervical lymph nodes a prophylactic lymphadenectomy was not performed. The postoperative course was uneventful and the patient could be discharged at the 3rd postoperative day. The possibility of secondary thyroid involvement deriving from other primary cancers was ruled out by PET-CT and panendoscopy. Postoperatively the patient received 30 fractions of adjuvant radiation therapy of the thyroid bed, the regional lymphatic drainage and the mediastinum with 54 Gy and a boost of the thyroid bed with 60 Gy over a 8-week period. 37 months after surgery, the patient developed a local recurrence infiltrating the left carotic artery and pulmonary metastasis. The patient refused any further treatment but is still alive 40 month after initial surgery.

3.2. Histopathological and immunohistochemical findings

The resected thyroid weighed 15 g. The left thyroid measured 4,0 × 3,0 × 2,2 cm. The cut surface showed a withish tumor with a size of 2,7 × 2,0 × 1,5 cm and the margins were clean. The right thyroid weighed 5 g with a size of 3,5 × 2,5 × 1,9 cm and an unremarkable cut surface. Microscopically the tumor appeared as a knotty grown solid epithelial neoplasm with

herd-like necrosis and hyperchromatic nuclei with prominent eosinophilic nucleoli, partially with horn formation. The tumor cell complexes were surrounded by collagen-rich connective tissue, with patch shaped lymphocytic infiltrates, which partially formed secondary follicles.

Histopathology and immunohistochemistry showing positivity for p63, CK5 is displayed in Fig. 1a–c while staining for thyroglobulin was restricted to the non-neoplastic thyroid tissue (Fig. 1d). In summary, the specimen showed a 2,7 cm in size, low differentiated, keratinizing squamous cell carcinoma. The surrounding parenchyma was presenting with a lymphocytic thyroiditis, presenting a final TNM-classification: pT2, pNx, L0, V0, G3, R0

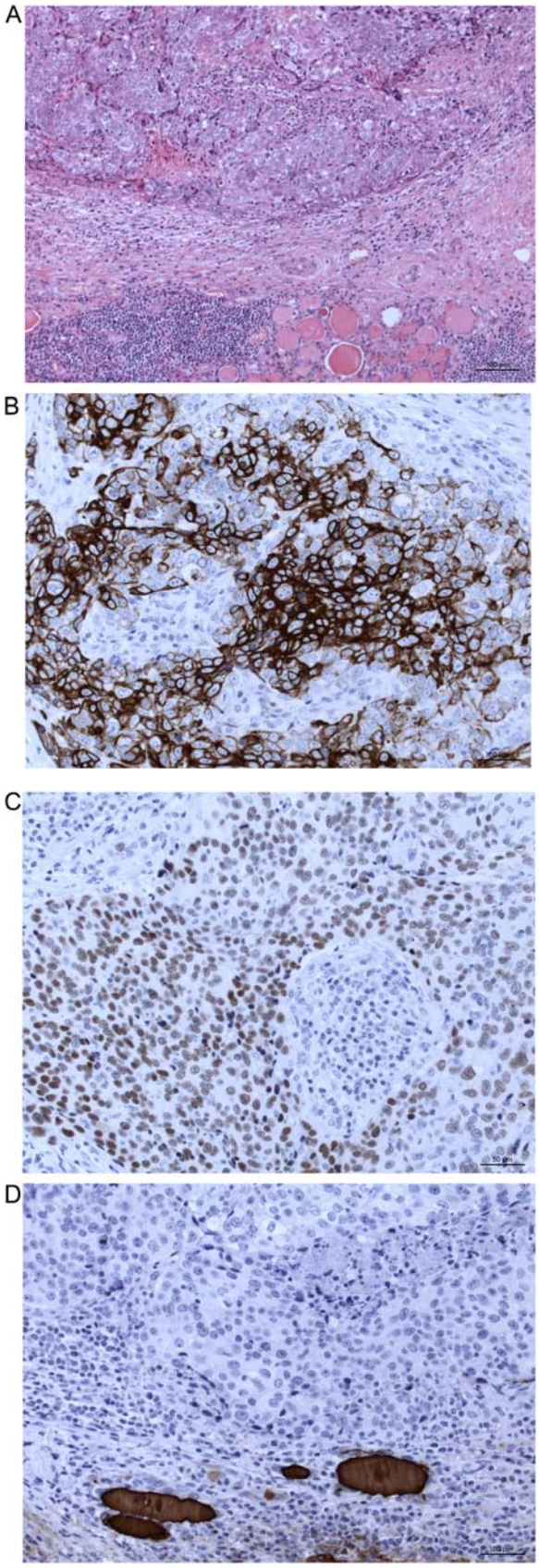

Fig. 1. a) Hematoxylin and eosin –staining 200×, b) Cytokeratin 5/6 immunohistopathology, c) p63 immunohistopathology, d) thyroglobulin immunohistopathology.