American Journal of Cancer Case Reports
http://ivyunion.org/index.php/ajccr/
Case Report

Rectal Carcinoma Metastasis to the Thyroid Gland - the Role of Radiotherapy: A Case Report

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Abstract:

Introduction: To date, a very rare occurrence of thyroid metastases from rectal cancer is described in the literature. Although there are no treatment standards for this condition, surgery still has a major role in the treatment of these patients. However, radiotherapy has a controversial role and its significance is rather palliative.

Case Presentation: We presented a male patient with metastatic rectal carcinoma to the thyroid gland who has been treated with surgery and palliative radiotherapy in our institution.

Conclusion: Although thyroid metastases from rectal cancer are rare, we recommend to think on their potential occurrence what could enable early diagnosis and more successful treatment.

Keywords: thyroid metastases; rectal carcinoma; radiotherapy

Received: August 30, 2020; **Accepted**: September 25, 2020; **Published:** November 14, 2020

Competing Interests: The authors have declared that no competing interests exist.

Consent: Consent was taken from the patient's next of kin for publication of this case report.

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Introduction

The thyroid gland is rarely the site of metastasis of malignant tumors, and metastatic tumors are reported to represent only 2–3% of all malignant tumors of the thyroid gland (1). Because thyroid metastases have been reported in 1–24% of cancer patients in autopsy studies their incidence may be higher (2). The incidence of thyroid metastasis among rectal cancer patients is extremely rare as confirmed by a study of Liévre et al. between 1993 and 2004 who identified 6 cases among 5862 patients with colorectal cancer (0.1%) (2, 3). The most common malignant tumors that metastasize to the thyroid gland are kidney, breast and lung cancer (3, 4). Thyroid metastases from rectal cancer are most commonly diagnosed in patients with locally advanced rectal cancer. They are often associated with lung and liver metastases (5).

Case presentation

In January 2013 a 71-year-old male patient was treated with neoadjuvant radiochemotherapy for low rectal carcinoma with distal edge of 4.5cm from the anus and clinical stage of the disease cT3cN1M0. Radiotherapy doses was 50.4Gy/28 fractions concomitantly with capecitabine. Neoadjuvant radiochemotherapy was followed by surgery (abdominoperineal resection) in March 2013. The postoperative stage was pT2pN0M0. He continued treatment with adjuvant chemotherapy (capecitabine) for the next 6 months.

In May 2015, 20 months after completion of the adjuvant chemotherapy, a left pulmonary metastasis was diagnosed and wedge resection of the lung was conducted (upper lobe of the lung), followed by chemotherapy with regimen XELOX (capecitabine plus oxaliplatin) up to 8 cycles (from June to December 2015).

Sixteen months after completion of XELOX chemotherapy, our patient experienced the symptoms such as hoarseness and difficulty swallowing.

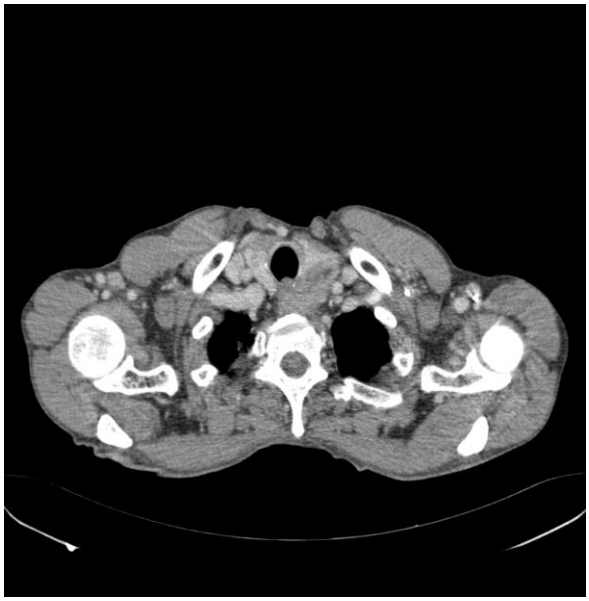

Figure 1 Preoperative CT: lesion in the left lobe of the thyroid gland.

Computed tomography (CT) scan of the neck showed a lesion in the left lobe of the thyroid gland (50x29x35mm) and spread of this mass to the tracheoesophageal groove (Figure 1). Otolaryngological examination (ENT) showed the left recurrent laryngeal nerve (RLN) paresis as a consequence of tumor spread into the tracheoesophageal groove. Ultrasonography and fine needle aspiration (FNA) of the thyroid mass were performed.

In April 2017, the malignant changes suggesting metastasis were cytologically proven. Marker values were: TSH (Thyroid-stimulating Hormone) – 0.14 mIU/l, fT4 (Free Thyroxine) – 14.7 pmol/l, TG (Thyroglobulin) – 59 ng/ml, CEA (Carcinoembryonic Antigen) - <0.5 ng/ml.

In June 2017 (45 months after completion of adjuvant chemotherapy) the patient underwent thyroid surgery (thyroidectomy without parathyroid gland removal using neuroelectrostimulator – debulking). Histopathology and immunohistochemical examination (CDX-2 and Thyroglobulin were positive and Calcitonin, CK19, HBME1, p53 and TTF were negative) confirmed the thyroid metastasis of rectal cancer. Also, metastases were diagnosed in Delphian lymph node, both lobes of thyroid gland, as well as tracheal and esophageal infiltration.

Postoperative CT showed (one month after thyroid surgery): in lower part of the left neck to observe inhomogeneous tumor formation with size 40x30mm, with infiltration of the adjacent neck muscles, and spread to the tracheoesophageal groove (Figure 2).

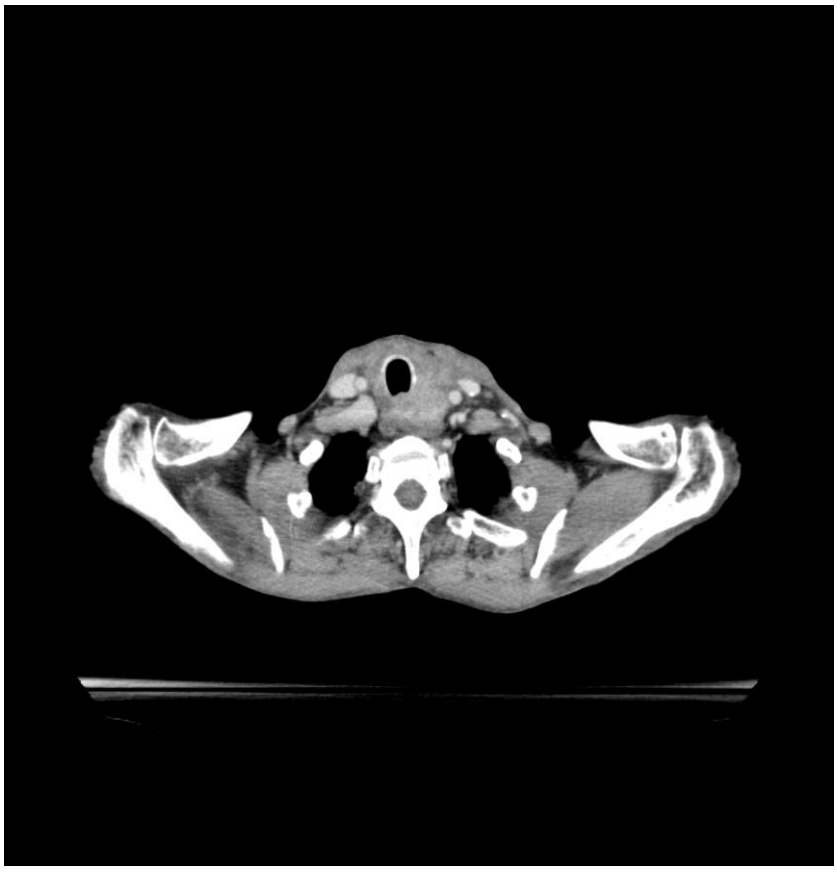

Figure 2 Postoperative CT: residual tumor.

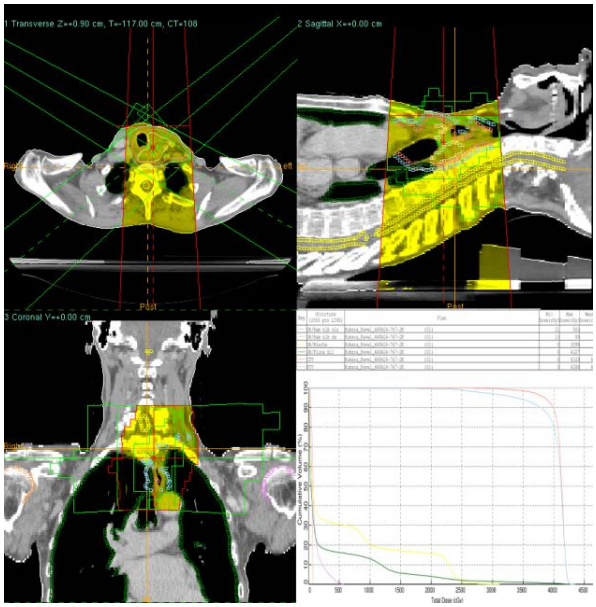

Figure 3 Radiotherapy plan – 3D conformal external beam radiotherapy.

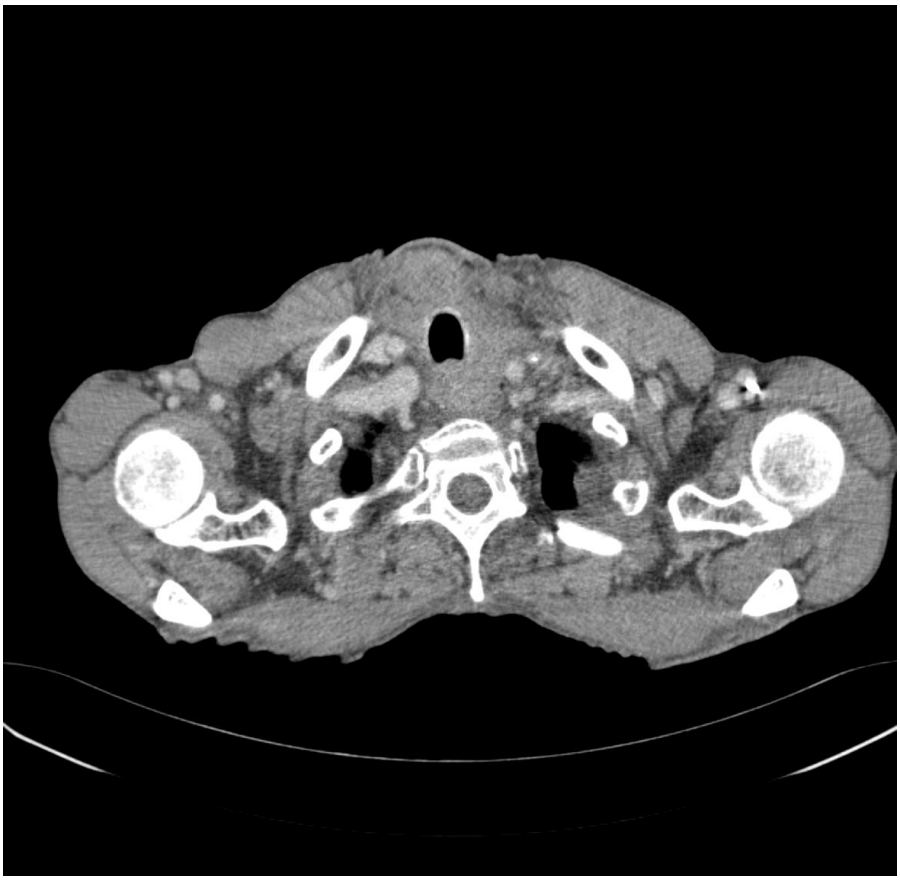

Figure 4 CT tumor progression after radiotherapy.

Thereafter, the patient received palliative radiotherapy at our Department. We conducted 3D conformal external beam radiotherapy on the left neck side with a total dose of 40Gy, hypofractionated regimen with a daily dose of 2.5Gy (EQD_2 [equivalent dose when delivered in 2Gy/fraction]=41.67Gy, BED_{10} [Biologically Effective Dose]=50Gy), by three fields' technique. We used a multileaf collimator (80 leaves, 40 × 40) and 6-MV X-ray energy on a linear accelerator (Figure 3).

Five months after the end of radiotherapy, the patient had tumor progression (Figure 4). Subsequently, he received 2 cycles of palliative chemotherapy bFOL (5-fluorouracil bolus/leucovorin + oxaliplatin), however, without effect.

Despite the use of all treatment modalities, the patient clinical condition deteriorated, he could not swallow and eat. Gastroscopy was performed and showed a stenosis just below Killian's dehiscence caused by extramural oppression. In March 2018 the push - PEG (Percutaneous endoscopic gastrostomy) was placed. The patient died 11 months after thyroidectomy and 10 months after radiotherapy.

Discussion

In general, thyroid metastases are less common (5). The incidence of thyroid metastasis among rectal cancer patients is extremely rare as confirmed by a study of Li évre et al. between 1993 and 2004 who identified 6 cases among 5862 patients with colorectal cancer (0.1%) (2, 3). This statement is also confirmed by studies from the USA and UK on 15 cases of metastatic thyroid tumors showed that the kidney was the most common primary source of thyroid metastasis, however, only one case showed thyroid metastasis from colorectal cancer (6).

The explanation for this phenomenon can be found in the fact that colorectal cancer spreads to the thyroid gland through the portal vein, vena cava, and pulmonary vein, however, sometimes the special physiology and pathology of the vertebral venous system enable such tumors to bypass the portal vein, pulmonary vein, and vena cava and to be transferred directly to the thyroid or any part of the body, without entering the thoracic and abdominal cavity (7).

In patients with advanced stage of the disease and location of primary tumor in the distal rectum thyroid metastases usually occur and then their occurrence are associated with a poor prognosis and high mortality (8, 9). Thyroid metastases from rectal cancer can occur from 0 to 8 years after rectal resection (5).

The presented patient corresponded with these data. He had a stage III cancer in the distal part of the rectum and thyroid metastasis was diagnosed 49 months after rectal resection.

As already mentioned, thyroid metastases occur in patients with locally advanced rectal cancer and are often diagnosed with other distant metastases, most often with lung metastases (either synchronous or metachronous), this combination is recorded in up to 60% of patients with thyroid metastases (7, 9).

Even in our patient thyroid metastasis from the rectal carcinoma occurred after lung metastasis (metachronous with 23 months interval). He underwent pulmonary resection 26 months after rectal resection. In our case report, there was no physiological exception of the spread of rectal cancer and the lung was not skipped, just lung and thyroid metastasis appeared metachronous.

Although there are no treatment standards for thyroid metastases, surgical resection is the treatment of choice, even in extensive metastatic disease. The extent of surgery in terms of total thyroidectomy or less radial resection does not affect the overall survival of patients (10). The other modalities did not show a significant effect. Colorectal metastases to the thyroid gland do not uptake

radioactive iodine, thereupon radioactive iodine therapy is not indicated. (6). Thyroid metastases from rectal cancer is an aggressive disease that is most often locally advanced at the time of diagnosis, and then radiotherapy and chemotherapy are performed, as well as, in patients with comorbidities who are not candidates for surgery, however, most often have a palliative role (6, 11).

Because the thyroid metastasis appeared many years after initial diagnosis, its diagnosis was even more difficult during routine patient follow-up. However, patient did not report any symptoms related to the thyroid function, nor did the diagnostic methods show any changes in the thyroid gland. Actually, he was euthyroid just before thyroidectomy. Clinical features, such as a hoarseness, and dysphagia appeared during the course of disease progression abruptly. Our patient underwent thyroidectomy to avoid the appearance of expected dyspnea when the trachea was also oppressed. Although this aggressive surgery was performed, a residual tumor remained. Then we decided to apply palliative radiotherapy, with mild hypofractionation. The role of radiotherapy in local tumor control was limited and its effect was short term, even subsequent palliative chemotherapy did not control tumor growth.

Five months after the end of radiotherapy, it was essential to place push - PEG due to tumor progression that caused the patient unable to swallow. Our patient died 10 months after the end of radiotherapy.

Conclusions

In routine clinical practice, the occurrence of thyroid metastases from rectal cancer is underestimated because their occurrence is rare. Although thyroid metastases from rectal cancer are not common, we should think about them because when they appear clinically, it is already a very aggressive disease that is difficult to control.

Optimal treatment of thyroid metastases from rectal cancer is still not standardly defined, but surgery certainly plays a major role in preventing respiratory and swallowing compression due to rapid growth of metastatic lesions with compression on the trachea and oesophagus.

However, the role of radiotherapy in our patient had a short-term effect and a controversial role. Nevertheless, we decided to show this case due to the rare occurrence of thyroid metastases from the rectal cancer and recommended to think on their potential occurrence enabling early diagnosis and more successful treatment.

Conflict of interest

No conflict of interest.

Consent

We give our consent that the manuscript has not been published or is under consideration for publication with any other journal.

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