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Case Report

Metachronous multiple primary malignancies: a case report of colon and thyroid cancer

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ABSTRACT

Cancer remains a challenging disease for our profession despite the medical and technological advances achieved in recent years. This challenge increases when we encounter multiple primary tumors that significantly modify the prognosis of our patients.

Keywords: Metachronous tumor, Thyroid cancer, Colon cancer, Multiple primary malignancies

INTRODUCTION

Cancer remains a constant threat affecting our population. It is estimated that by 2040, the number of cases will increase to 29.5 million and the number of deaths to 16.4 million.[1] As we find measures to limit the progression of the disease and improve the life prognosis of our patients, in the case of some cancers, we may observe an increased survival rate, consequently leading to the emergence of multiple primary malignant tumors, which result in higher mortality and a decrease quality of life. Additionally, there still exists significant difficulty in establishing the appropriate diagnosis, leading to delays in optimal treatment.

CASE REPORT

Male patient, 67 years old, with a chronic degenerative history of long-standing arterial hypertension. He has been a tobacco and marijuana user for 35 years. No family history of cancer reported during interrogation.

Diagnostic protocol initiated in 2021 due to increased volume in the anterior cervical region, undergoing thyroid ultrasound which reported: TIRADS 5 with extensive left lymph node infiltration. Therefore, total thyroidectomy was decided. During surgical procedure, the findings reeported where a left lobe tumor involving 2/3 of the sternocleidomastoid muscle and external jugular vein found and macroscopically positive lymph nodes in level II, smaller than 1 cm, an hypervascularized thyroid isthmus, and hypervascularized right lobe. Tissue samples were sent for histopathological examination, resulting in micropapillary thyroid carcinoma in the left lobe measuring 11.2×10.8.3 cm and micropapillary thyroid carcinoma in the right lobe measuring 0.3×0.3 cm.

In March 2022, recurrence in the left supraclavicular region occurred, leading to lesion resection. It was decided to perform a new surgery, where the tumor presented at level cervical IV was invading the proximal portion of the carotid, therefore total removal of the was not performed. Tissue samples were sent for biopsy with a report indicating metastatic papillary carcinoma to soft tissues of

the neck, with vascular permeation and intense chronic inflammation. (Figures 1a and b).

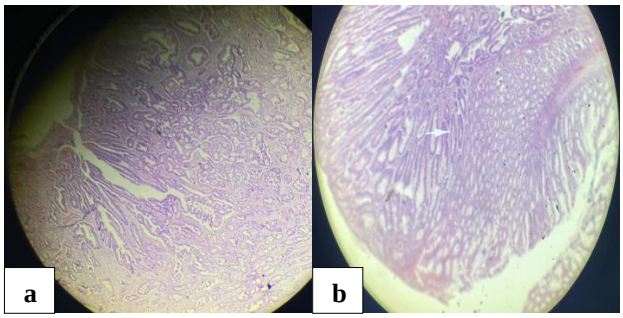

Figure 1 (a and b): Papillary carcinoma in the soft tissues of the neck with extensive lymphovascular invasion.

In late 2022, during follow-up consultation with a new oncological surgeon, a large anterior cervical lesion was identified, at the moment it was decided to schedule a new procedure. The patient went under a radical neck dissection with pectoral flap. A tumor measuring 30×20 cm adhered to the trachea, left sternocleidomastoid and omohyoid muscles, with the left carotid artery retracted towards the tumor, abundant tissue fibrosis was found. The procedure was carried out without complications. During this period, the patient received ablative doses of radioactive iodine and radiotherapy with 35 fractions, ending in March 2023, showing gradual recovery.

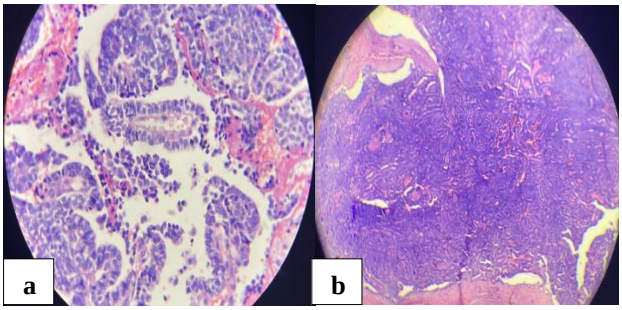

Figure 2 (a and b): Moderately differentiated intestinal-type adenocarcinoma extending into the deep muscular layer without reaching the serosa.

Subsequently, in July 2023, the patient spontaneously presented to the emergency department with abdominal pain lasting 10 days, accompanied by nausea, vomiting, and fever. Initial conservative management with nasogastric tube placement was initiated without improvement, progressing to signs of acute abdomen. Urgent intervention revealed a new tumor in the sigmoid colon adhered to the abdominal wall, with carcinomatosis and ascites. Resection and colostomy were performed. Histopathological examination revealed a second neoplasm as moderately differentiated intestinal-type adenocarcinoma with extension to deep muscular layers without reaching the serosa, focal angiolymphatic permeation, and metastasis in 5 out of 14 resected lymph nodes. The patient was diagnosed and classified as thyroid cancer EC IVB under treatment and colon cancer EC IV due to carcinomatosis, and palliative management was initiated. Post-surgical follow-up included a thoracoabdominopelvic computed tomography (CT) scan revealing pulmonary metastasis.

Currently, the patient continues to receive palliative care provided by medical oncology without the need for further surgical intervention, but with evidence of progression according to RECIST 1.1 of the metastatic lung lesion due to thyroid cancer.

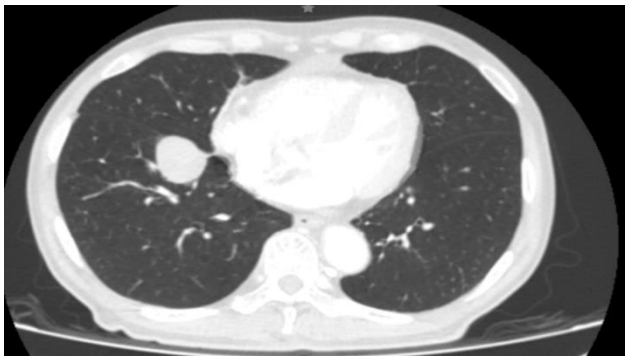

Figure 3: Metastatic lung disease.

DISCUSSION

Colorectal cancer is among the most prevalent and frequently diagnosed neoplasms, continuing to increase despite efforts in primary prevention. Currently, it ranks as the third most common cancer worldwide, comprising 9.6% of all oncological diseases, with nearly 1,926,425 new cases annually and a mortality rate of 9.3%.[2]

Thyroid cancer, which predominantly affects females, stands as one of the most prevalent endocrine neoplasms. In 2020, approximately 821,214 new cases were diagnosed, with a mortality rate of 0.49%.[3]

The International Agency for Research on Cancer defines multiple primary malignancies (MPM) as the presence of two or more tumors in the same patient with different histopathological lineages, either within the same organ or in different organs. These tumors are classified as synchronous if diagnosed within less than 6 months of each other, or metachronous if diagnosed with a longer interval. However, it does not consider occurrences happening simultaneously.[4]

In 1930, Warren and Gates established criteria for identifying MPM: confirmation of the malignant nature of each tumor, histologically distinct tumors, and absence of one tumor being a metastasis of the other.[5] Proper classification is crucial because misidentifying invasion, recurrence, or metastasis as multiple primaries significantly impacts cancer statistics and affects appropriate, targeted treatment for patients.

The incidence of these tumors varies depending on the study, ranging from 0.52% to 11.7%. Recent literature suggests an increasing trend, possibly linked to longer life expectancy. Approximately 75% of MPM patients are over 50 years old.[5,7,8]

Factors contributing to the rise in multiple primary tumors include advancements in diagnostic tests, improved treatment options, and enhanced patient monitoring and screening.[9] The development of technologies such as PET-CT scans and MRI allows for earlier and more accurate tumor detection compared to older methods. Advancements in molecular diagnostics enable oncologists to identify specific genetic mutations and biomarkers associated with different types of cancer, guiding more personalized and targeted therapies. Additionally, improved treatment options, including novel chemotherapy agents, immunotherapies, and targeted therapies, have extended survival rates for cancer patients, thereby increasing the likelihood of developing subsequent primary tumors over time.

While some patients may not have a family history of oncological diseases, emerging evidence from various studies suggests that environmental factors play a significant role in the development of MPM. Smoking, widely recognized as a major risk factor for multiple neoplasms, substantially increases the likelihood of secondary primary tumors.

Additionally, aging contributes to the deterioration of DNA repair mechanisms, thereby facilitating carcinogenesis.[10,11] Therefore, it is crucial to meticulously evaluate and address specific risk factors associated with each type of tumor in our patients.

The digestive system is the predominant site for primary, secondary, and tertiary malignancies, with the lung, head, and neck following closely behind.[12] Given the diverse nature of these malignancies, separate staging is imperative for accurate treatment planning.[13]

Each tumor may present distinct staging criteria based on size, lymph node involvement, and metastatic spread. Precision in staging ensures that treatment decisions align closely with the specific characteristics and progression of each malignancy, thereby improving patient outcomes.

Scientific literature highlights similarities among reported cases; for example, tumors affecting the esophagus and stomach often share common pathogenic factors within the digestive system.[14,15] Moreover, treatment administered for a primary tumor can lead to the subsequent development of secondary tumors.

Managing patients with metachronous multiple primaries poses therapeutic challenges, ranging from localized interventions to palliative care for advanced stages. Decisions must consider the ongoing treatment of the initial cancer when addressing subsequent malignancies.[16]

CONCLUSION

Identifying multiple primary malignancies accurately is crucial as it involves diagnosing two or more tumors of different types within the same patient. These tumors can either occur synchronously, meaning they are diagnosed close together, or metachronously, where they appear at different times. Precise identification is vital to tailor effective treatment strategies. The incidence of these malignancies varies widely and is influenced by advanced diagnostic tools like PET-CT and MRI, alongside personalized therapies. Factors such as smoking and aging play significant roles. Managing these cases poses challenges, from selecting appropriate treatments to ensuring ongoing therapies are considered for optimal patient care.

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