

# Bilateral ovarian metastases from pulmonary neuroendocrine tumor.

## A case report and literature review

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### ABSTRACT

Pulmonary cancer is commonly associated with the development of distant metastases at the level of liver, bones, adrenal glands and even brain. However, in certain cases other metastatic sites might be encountered such as the ovaries; however, these situations have been rarely encountered. The aim of the current paper is to present the case of a 39 year old patient with previous history of pulmonary neuroendocrine tumor, submitted to palliative radio-chemotherapy who was diagnosed with two large ovarian tumors and high volume of ascites which impaired even more the respiratory function. The patient was submitted to hysterectomy and bilateral adnexectomy, the histopathological studies demonstrating the metastatic origin of the tumors.

**Keywords:** neuroendocrine pulmonary tumor, ovarian metastases, surgery

### INTRODUCTION

Lung cancer represents after breast and colon cancer the third most commonly encountered malignancies affecting people worldwide [1]; the most commonly encountered sites for metastases with lung cancer origin are represented by liver, bones and brain; however in isolated cases metastatic lesions might be found in other sites such as at the level of the ovaries [2-4]. When it comes to the ovarian involvement as metastatic sites, they are usually involved in gastric and colonic cancer, the resulting lesions being known as Krukenberg tumors [5-8]. As for Krukenberg tumors from pulmonary malignan-

cies, only isolated cases have been described so far, a standard therapeutic option being not yet well defined [9]. The aim of the current paper is to describe the case of a 39 year old patient diagnosed during the follow up process for an unresectable pulmonary neuroendocrine lesion with increasing tumoral masses at the level of the both ovaries.

### CASE REPORT

The 39 year old patient was initially diagnosed with a large neuroendocrine lung tumor invading the trachea and with metastatic pulmonary nodules

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Article History:

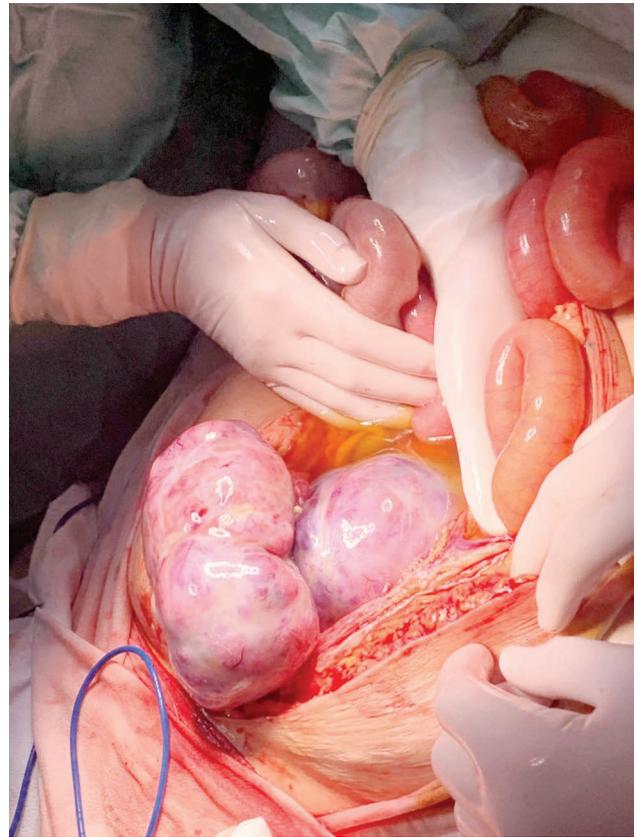
Received: 18 April 2022

Accepted: 30 April 2022

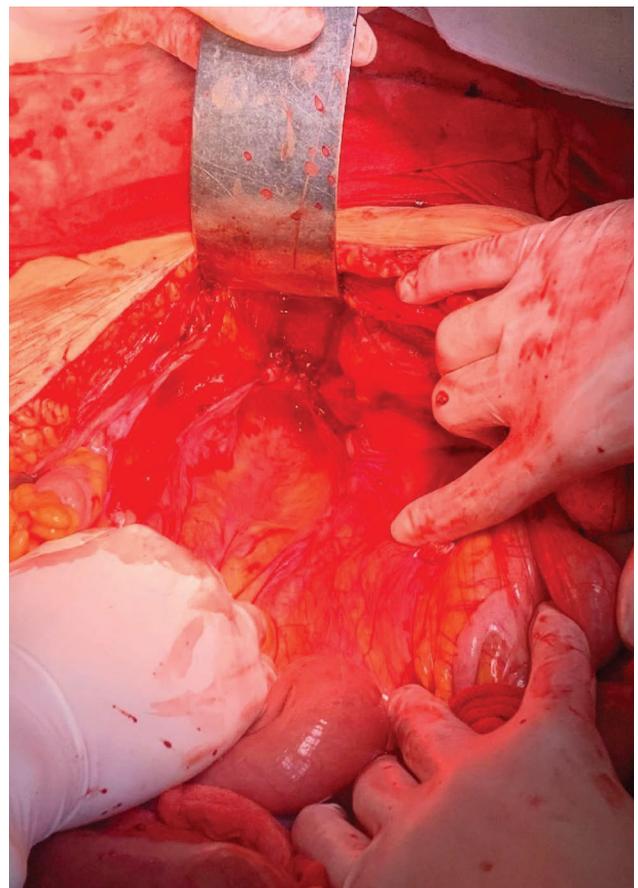
three years previously and therefore was considered as a case for palliative radiotherapy in association with chemotherapy. Therefore she was submitted to palliative radiochemotherapy; at two year follow up the patient was also diagnosed with two ovarian tumors measuring 3/4/3 cm and respectively 5/7/6 cm. one year later when she was submitted to standard computed tomography, a significant enlargement of the two lesions was encountered, the right adnexa measuring now 5/6/4 cm while the left adnexa measured 10/8/9 cm; meanwhile a high volume of ascites was encountered, explaining therefore the worsening of the respiratory function, symptoms which has been previously reported by the patient. Meanwhile the biological tests reported a slightly increased level of serum CA 125 – at 220 U/ml in association with severe thrombocytopenia, a value of 4000 thrombocytes/microL being encountered. The decision was to submit the patient to abdominal surgery; therefore, the main indications for surgery were to decrease the abdominal pressure and to improve the respiratory function, to establish the primary or secondary nature of the ovarian tumors and to prevent the development of further coagulation disorders. After a careful preoperative preparation the patient was submitted to surgery, intraoperatively 4500 ml of ascites being evacuated; meanwhile the two ovaries which were transformed into large tumoral masses were resected en bloc with total hysterectomy. The total mass of the solid resected specimen was of 3800 g, decreasing significantly the intraabdominal pressure (Figures 1-3). The postoperative course was marked by the apparition of a diffuse intraperitoneal bleeding which was successfully managed into a conservative manner by systemic administration of plasma and blood products. The patient was discharged in the sixth postoperative day, in a good clinical status, with improved respiratory parameters and improved biological tests (a total number of thrombocytes of 120.000/microL). The histopathological studies demonstrated the metastatic origin of the ovarian lesions and excluded a synchronous primary ovarian tumor. Therefore, the patient was referred to the oncology service in order to be submitted to a second line cytotoxic therapy for small cell lung neuroendocrine tumor.

## DISCUSSIONS

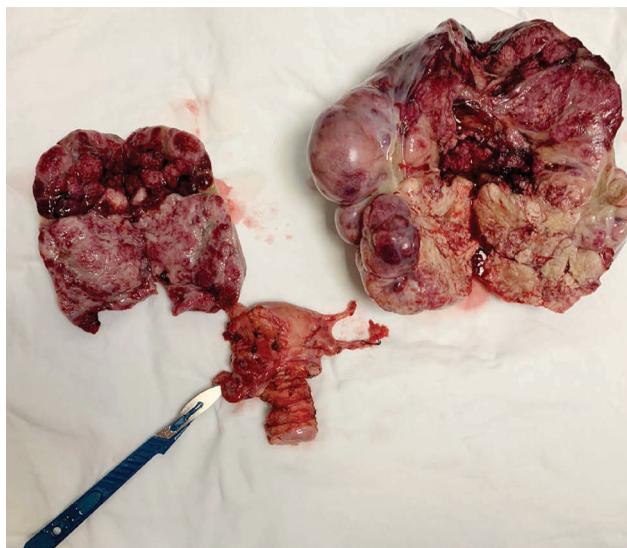
Pulmonary neuroendocrine tumors represent up to 25% of all pulmonary cancers and, according to their cellularity, they are classified in typical carcinoids, atypical carcinoids, large cell and respectively small cell neuroendocrine tumors. As expected, small cell neuroendocrine carcinomas represent a particularly aggressive biological subtype which is characterized by a high capacity of dissemination



**FIGURE 1.** Intraoperative aspect: large bilateral ovarian tumors and ascites



**FIGURE 2.** The final aspect after total hysterectomy with bilateral adnexectomy



**FIGURE 3.** The specimen of total hysterectomy with bilateral adnexectomy

[10]. These histopathological features might explain the capacity of the tumoral cells to lead to the apparition of distant site metastases at the level of the ovaries.

An important fact which was taken in consideration when deciding to perform the surgical procedure in this case was related to the fact that without resection, a diagnostic of synchronous ovarian cancer could not be excluded. Therefore, this fact was important for establishing the extent of the disease and a proper follow up of the primary tumor; meanwhile, it was mandatory to exclude a primary ovarian cancer in order to establish which the most appropriate therapeutic strategy is.

Once the histopathological diagnosis was the one of a metastatic disease, the chemotherapy line was changed. Another point of the surgery was to improve the respiratory function of the patient; therefore once the laparotomy was performed, approxi-

mately 4500 ml of ascites was aspirated while by removing the specimen, other 3800 grams were taken out, significantly diminishing the intraabdominal pressure. Therefore the respiratory function rapidly improved during the postoperative period.

Another important point which should be underlined at the time when discussing the current case was the one of the associated thrombocytopenia. In pulmonary cancer, similarly to breast and colorectal cancer, the presence of thrombocytopenia is correlated with an overall poor prognosis and as expected, with a higher risk of postoperative bleeding [11]. In such cases multiple mechanisms have been proposed, consisting of the presence of different mutations in the genes providing platelet maturation and production or of increased cytokine levels [12]. Meanwhile, we should not omit the fact that the previous history of chemo-irradiation might play a central role in explaining this deficit [13].

However, in the case we came to present we consider that a significant influence was created by the tumors themselves due to the fact that after surgery a correction of the number of the circulating platelets was obtained.

## CONCLUSIONS

Although rare eventualities, ovarian metastases from pulmonary neuroendocrine tumors might be encountered, especially in cases in which a biologically aggressive subtype is identified. In such cases surgery is justified in order to orientate the diagnostic, to decrease the abdominal pressure in cases in which significant amounts of ascites is present and to correct certain paraneoplastic manifestations such as severe thrombocytopenia.

*Conflict of interest:* none declared

*Financial support:* none declared

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