

Development of Pleural Effusion after Treatment of Krukenberg Tumor

Jorge Luiz Barillo, Leonardo da Silva Caliman, Cyro Teixeira da Silva Junior*, Joeber Bernardo Soares de Souza, Patricia Siqueira Silva, Carmem Lucia Teixeira de Castro, Alessandro Severo Alves de Melo, Aline Paganelli

Santa Teresa Hospital, City of Petropolis and Pleural Diseases Unit, City of Niteroi, Fluminense Federal University, State of Rio de Janeiro, Brazil

*Corresponding author: Cyro Teixeira da Silva Junior | Received: 16.02.2019 | Accepted: 26.02.2019 | Published: 28.02.2019
DOI: 10.36347/sjmcr.2019.v07i02.013

Abstract

Case Report

A Krukenberg tumor (KT) with metastasis to the peritoneum as well as the pleura is a rare case. Our diagnostic approach with a malignant pleural effusion from KT involving cancer biomarkers, pleural adenosine deaminase, and video-assisted thoracoscopic surgery after thoracentesis without closed needle pleural biopsy, possibly avoided the diagnosis of an undiagnosed pleural effusion syndrome.

Keywords: Pleural effusion, malignant pleural effusion, gastric adenocarcinoma, Krukenberg tumor, cancer biomarkers.

Copyright © 2019: This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use (NonCommercial, or CC-BY-NC) provided the original author and source are credited.

INTRODUCTION

A Krukenberg tumor (KT) is a rare metastasized ovarian cancer from a primary site with poor prognosis and prevalence for about 1%-2% of all ovarian tumors. These tumors can originate in the stomach, intestines, pancreas, biliary tree, breasts, gallbladder, uterine cervix, appendix, urinary bladder, or certain unknown sites. These tumors are adenocarcinomas with a distinctive histologic appearance [1, 2]. We present a case of KT with metastasis to the peritoneum as well as the pleura.

CASE REPORT

A 54-year-old non-smoker female was presented with progressive abdominal distension and no other symptoms. On examination, a pelvic mass was detected, which was confirmed by abdominal computed tomography. The patient underwent resection of the ovarian mass and histopathological results revealed the presence of adenocarcinoma with signet-ring cells [Fig. 1]. After the results of the upper digestive endoscopy were evaluated, the resection of neoplastic gastric lesions with the malignancy infiltrating perigastric lymph nodes was performed.

The patient received further treatment with chemotherapy. Nine months later, she was admitted to our hospital with progressive abdominal distension and dyspnea. Chest computed tomography was performed, which revealed the presence of large bilateral pleural effusion. Thus, video-assisted thoracoscopic surgery (VATS) was performed into right hemithorax of the patient under general anesthesia and single-lung ventilation was done after obtaining written consent. During VATS, 1500 mL of serohematic pleural fluid was aspirated and visualized to reveal multiple small nodular lesions of the parietal and visceral pleura, suggesting multiple metastatic implants with a signet-ring feature, as confirmed by histopathological analysis [Fig. 2].

The pleural fluid was classified as an exudate with elevated levels of cancer biomarkers and low level of adenosine deaminase (ADA, 6.74 UI/L). Carcinoembryonic antigen (CEA) and cytokeratin 19 fragment (CYFRA 21-1) levels were 1928.0 ng/mL and 39.21 ng/mL, respectively. The patient was treated by pleurodesis, using tetracycline evolving to total lung reexpansion.

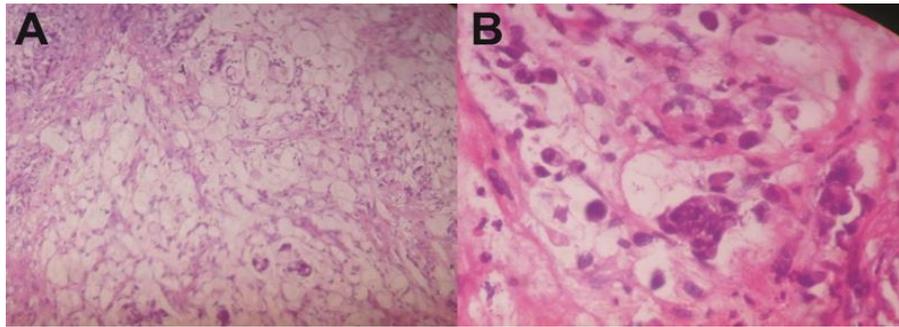


Fig-1: Histopatolgy of the ovary with Krukenberg tumor. A) Nests and cords of atypical cells, with edematous stroma that separates cellular areas (×100, H&E stain). B) Numerous signet-ring cells with pale cytoplasm are arranged irregularly within the edematous estroma infiltrating the ovary (×400, H&E stain)

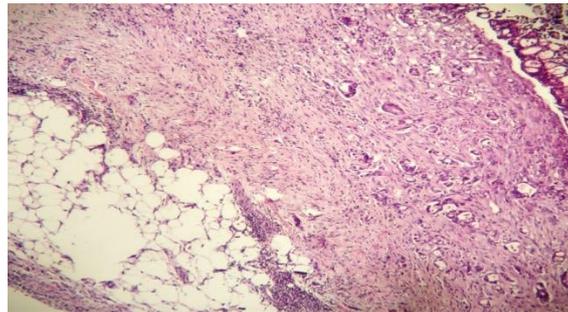


Fig-2: Characteristics of the pleural lesions obtained after VATS. Histopathology of the pleural implants indicating adenocarcinoma with signet-ring cells H & E stain (x100)

DISCUSSION

This case demonstrates the occurrence of bilateral pleural effusion in a woman with KT. In this case, a KT was characterized, which initially spread to the ovary and later, to the peritoneum and pleura with malignant pleural effusion. In such cases, gastric cancer is usually diagnosed first, which was not the case here. Ovarian metastasis often occurs during peritoneal dissemination. Certain clinical manifestations that have been reported in the literature such as abdominal pain, palpable pelvic mass, ascites, history of surgery for gastric cancer or other digestive tract cancer, and abnormal uterine bleeding were found in our patient [2].

The classic pattern of a KT involves the predominant presence of signet-ring cells filled with mucin pleomorphic sarcomatoid proliferation of ovarian stroma, as seen in the histopathological analysis. This pattern correlates with primary carcinoma of the stomach [3].

Diagnostic biomarkers can be helpful in distinguishing primary ovarian adenocarcinomas from metastatic carcinomas [3]. A serological dosage of the biomarker CA-125 is useful for the diagnosis of suspected primary ovarian carcinomas [3, 4]. It has a copositivity of 30-45% in women with early-stage disease together with transvaginal ultrasonography [3, 4]. Abnormal levels of serum CA-125 were observed in 76% of primary ovarian cancer but the accuracy of the diagnosis was insufficient [3, 4]. This biomarker is not recommended as a screening test because it has

relatively high false positive rate in premenopausal women [4]. It was not possible to quantify CA-125 in serum or pleural fluid of this patient using this approach. However, this did not affect the suggested diagnosis because the KT in this case is metastatic and not a primary cancer of the ovary. The pleural space is the most prevalent extra-abdominal site for ovarian cancer. The involvement of lung parenchyma is rare [1, 2]. The high levels of CEA and CYFRA-21 in the pleural fluid of our patient suggested metastatic pleural effusion from adenocarcinoma. The low level of ADA in pleural fluid refutes the diagnosis of pleural tuberculosis [5].

Peng *et al.* do not recommend ovarian metastasectomy if the primary stomach lesion cannot be resected or if ascites are detected. Other authors have concluded that bilateral oophorectomy should be performed to prevent the risk of symptomatic contralateral tumors [6,7]. Only early diagnosis allows complete tumor resection and can improve the survival rate, which is estimated to be between 7 months to 5 years [2]. However, metastasectomy with chemotherapy enhances the overall survival rate in gastric cancer with KT [8].

CONCLUSION

A Krukenberg tumor with metastasis to the peritoneum as well as the pleura is a rare case. Our case report provides additional information on the significance of VATS and cancer biomarkers in pleural fluids. Our diagnostic approach with a malignant

pleural effusion from KT involving VATS after thoracentesis without closed needle pleural biopsy, possibly avoided the diagnosis of an undiagnosed pleural effusion syndrome [9].

REFERENCES

1. Bullón A, Arseneau J, Prat J, Young RH, Scully RE. Tubular Krukenberg tumor. A problem in histopathologic diagnosis. *Am J Surg Pathol*. 1981 Apr;5(3):225–32.
2. Jun S-Y, Park JK. Metachronous ovarian metastases following resection of the primary gastric cancer. *J Gastric Cancer*. 2011 Mar;11(1):31–7.
3. Nguyen L, Cardenas-Goicoechea SJ, Gordon P, Curtin C, Momeni M, Chuang L, Fishman D. Biomarkers for early detection of ovarian cancer. *Women's health*. 2013 Mar;9(2):171-87.
4. Topalak O, Saygili U, Soy Turk M, Karaca N, Batur Y, Uslu T, Erten O. Serum, pleural effusion, and ascites CA-125 levels in ovarian cancer and nonovarian benign and malignant diseases: a comparative study. *Gynecologic oncology*. 2002 Apr 1;85(1):108-13.
5. Da Silva CT, Behrsin RF, Cardoso GP, de Araújo EG. Evaluation of adenosine deaminase activity for the diagnosis of pleural TB in lymphocytic pleural effusions. *Biomark Med*. 2013 Feb;7(1):113–8.
6. Peng W, Hua RX, Jiang R, Ren C, Jia YN, Li J, Guo WJ. Surgical treatment for patients with Krukenberg tumor of stomach origin: clinical outcome and prognostic factors analysis. *PLoS One*. 2013 Jul 9;8(7):e68227.
7. Seow-En I, Hwang G, Tan GH, Ho LM, Teo MC. Palliative surgery for Krukenberg tumors—12-year experience and review of the literature. *World journal of clinical oncology*. 2018 Feb 10;9(1):13.
8. Cho JH, Lim JY, Choi AR, Choi SM, Kim JW, Choi SH, Cho JY. Comparison of surgery plus chemotherapy and palliative chemotherapy alone for advanced gastric cancer with Krukenberg tumor. *Cancer research and treatment: official journal of Korean Cancer Association*. 2015 Oct;47(4):697.
9. Nakao M, Oguri T, Miyazaki M, Uemura T, Takakuwa O, Kunii E, Ohkubo H, Maeno K, Sato S. Diagnosis of ovarian cancers using thoracoscopy: Three case reports and review of the literature. *Experimental and therapeutic medicine*. 2012 Jul 1;4(1):141-5.