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Case Report

Comprehensive Treatment of Recurrent Ovarian Cancer. Clinical Case

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Abstract

This clinical case represents a medical history of a 47-year-old patient S., who consulted an oncologist with complaints of abdominal enlargement and general weakness. The ovarian cancer FIGO stage IVB (metastases to the omentum, liver, spleen, and peritoneal carcinomatosis) was diagnosed. The patient underwent multiple stages of combined treatment, including surgery, adjuvant and anti-relapse chemotherapy, hormone therapy, and intraperitoneal heat therapy (HIPEC). The case demonstrates the complexity of managing recurrent ovarian cancer, the importance of a personalized approach, and monitoring side effects to ensure quality of life.

Introduction

Ovarian cancer is one of the most aggressive types of malignant tumors in women, characterized by a high rate of recurrence and the complexity of therapy in the late stages. Modern treatment approaches include a combination of surgical cytoreduction, chemotherapy, targeted therapy, and immunotherapy [1,2]. This clinical case represents a medical history of a 47-year-old patient with recurrent ovarian cancer, which illustrates the multimodal approach to therapy and the challenges associated with side effects.

Case description

Patient S., born in 1978 (47 years old), consulted an oncologist in February 2020 with complaints of abdominal enlargement and general weakness. Based on clinical examination, laboratory, and instrumental diagnostic methods, the diagnosis was made: ovarian cancer T3cNXM1, stage IVB, with metastases to the omentum, liver, spleen, and peritoneal carcinomatosis.

Family history

The patient's father was diagnosed with laryngeal cancer at the age of 54. He had a history of smoking and underwent combined treatment for 3 years. He was not tested for hereditary mutations (e.g., BRCA1/2 or others). The patient is married and lives with her husband, who actively supports her during treatment. She has a daughter (18 years old). The patient has no harmful habits (e.g., smoking or alcohol use). The patient worked as a laboratory technician without occupational hazards.

Primary treatment

The primary cytoreduction was performed (hysterectomy, bilateral salpingoophorectomy, and omentectomy) on March 3, 2020. Histological examination revealed high-grade endometrioid-type ovarian carcinoma with metastases to the omentum. From April 23 to August 20, 2020, the patient received 6 cycles of Adjuvant Chemotherapy (ACT) - carboplatin 5 AUC + paclitaxel 175 mg/m^2 regimen.

Recurrence of the disease

During follow-up on December 10, 2021, signs of disease recurrence were detected. A CT scan from December 18, 2021, showed a recurrence in the area of the vaginal stump, a disseminated process with involvement of the retroperitoneal lymph nodes, liver capsule, and peritoneal carcinomatosis. Tumor markers (January 25, 2022) were elevated: HE-4 = 58.88 pmol/L; CA-125 = 85.79 U/ml; ROMA = 35.6%. From January 27 to March 29, 2022, 3 cycles of first-line anti-relapse chemotherapy were performed (paclitaxel 285 mg + cisplatin 110 mg every 21 days). Adverse events occurred: grade II peripheral sensory neuropathy and grade I anemia, which were corrected with the participation of a neurologist and hematologist.

Second-line chemotherapy and secondary cytoreduction

A CT scan on April 26, 2022, showed disease progression: a 10% increase in the mass in the vaginal stump and the appearance of a mass in the left ovary. From May 2 to May 16, 2022, 3 cycles of second-line palliative chemotherapy (docetaxel 120 mg + gemcitabine 1400 mg every 21 days + CSF (filstim)) were administered. After the second cycle, febrile neutropenia occurred, requiring CSF, antibiotic therapy, and antifungal therapy. CT scan on June 10, 2022 showed positive dynamics: a decrease in the formations in the vaginal stump area by 42%, along the posterior-left contour of the vaginal stump by 9%, in the left ovarian bed by 46%, as well as a decrease in lymphadenopathy in the para-aortic 2 and iliac lymph nodes by 29% and 54%, respectively. The nodes in the mesentery remained stable.

On July 11, 2022, a secondary cytoreduction was performed. It included radical excision of the retroperitoneal lymph nodes and intra-abdominal tumor lesion with hyperthermic intraperitoneal chemoperfusion (HIPEC) (cisplatin 170 mg, 90 min, t 43.5 °C). Histological examination of removed lesions confirmed the recurrence of endometrioid G2 carcinoma with serous low-grade foci of the ovaries with metastases in 6 of 12 para-aortic and 2 iliac lymph nodes.

The postoperative level of CA-125 on August 11, 2022, was not higher than the normal limit =17.73 U/mL.

From August 15 to September 30, 2022, 3 cycles of adjuvant chemotherapy (docetaxel 120 mg + gemcitabine 1400 mg every 21 days + CSF) were performed.

Remission and relapse

The patient was in remission ten months from October 2022 to July 2023. CA-125 from October 20, 2022, was 6.5 U/ml. However, during follow-up examinations in August 2023, an increase in CA-125 to 140.76 U/ml was noted. A CT scan of August 21, 2023, showed the appearance of pathologically altered supraclavicular, periportal, portocaval, retrocaval, and iliac lymph nodes. From August 31 to December 15, 2023, 6 cycles of second-line chemotherapy (docetaxel 100 mg + gemcitabine 1200 mg every 21 days + CSF) were performed. A CT scan of November 15, 2023, and CA-125 of January 10, 2024 (107 units/ml) confirmed the stabilization of the tumor process.

Hormone therapy and molecular genetic testing

To determine the optimal treatment strategies for this patient, including hormone therapy, targeted therapy, and immunotherapy, Immunohistochemical (IHC) examination of the tumor material was performed. The goal was to assess the expression of Estrogen Receptor alpha (ER), Progesterone Receptor (PR), HER2/neu expression, and to determine Microsatellite Instability (MSI) to predict sensitivity to immunotherapy [2,3]. The IHC analysis revealed the following results:

- **Estrogen Receptor alpha (ER) expression:** Positive, 90% of tumor cells showed high expression, indicating hormone sensitivity of the tumor.
- **Progesterone Receptor (PgR) expression:** Negative (PgR (-)), indicating lack of sensitivity to progesterone therapy.
- **Her2/neu expression:** Negative (Her2/neu (-)), excluding the feasibility of using targeted therapy directed at Her2 receptors (e.g., trastuzumab).
- **Microsatellite Instability (MSI):** The tumor was defined as microsatellite stable (MSS), indicating a low probability of response to immunotherapy with checkpoint inhibitors (anti-PD-1/PD-L1).

According to the results of the immunohistochemical study, tamoxifen 60 mg daily was prescribed from January to May 2024 [4]. Hormone therapy stabilized the disease for five months [4]. Then the signs of disease progression were revealed.

After disease progression during hormone therapy, a molecular genetic study (NGS, 32 genes) was performed, which revealed a pathogenic mutation c.35G>C (p. Gly12Ala) in the KRAS gene (AF: 32.34%), which may be an additional factor for considering targeted approaches in the future, although specific KRAS G12A inhibitors are currently in clinical trials [5-7].

From May 22 to August 8, 2024, 5 cycles of fourth-line PCT (topotecan 2.5 mg, days 1–5, every 21 days + CSF) were performed. A CT scan from August 19, 2024, showed stabilization of the process, but the appearance of right-sided pleurisy was noted. From September 26, 2024, the fifth line of PCT (liposomal doxorubicin 70 mg every 28 days) was started. After the first cycle, grade III neutropenia, grade I anemia, and grade II stomatitis occurred, requiring CSF, antibiotic therapy, antifungal, and antianemic drugs.

From October 23 to November 22, 2024, the dose of liposomal doxorubicin was reduced by 25% (52.5 mg) due to the occurrence of side effects.

Deterioration of the condition and further treatment

In early December 2024, the patient's condition deteriorated sharply: increasing shortness of breath, dry cough, fever up to 38 °C, weight loss of 5 kg, decreased appetite, CA-125 > 800 U/ml, and increasing right-sided pleurisy. Pleural puncture (1500 ml of exudate) and cytology confirmed cancerous pleurisy. From December 25, 2024, to May 21, 2025, 6 cycles of PCT (pemetrexed 800 mg + carboplatin 5 AUC every 21 days) were performed. CA-125 from April 9, 2025, decreased to 420.79 U/ml, and a CT scan from June 19, 2025, showed stabilization of the process. At

Table 1: Main steps of the treatment of a recurrent ovarian cancer patient.

Methods of Treatment /Relapse	Time	Drugs (Doses)	Treatment Results
Primary Cytoreduction	03/03/2020		Complete cytoreduction (CC0)
Adjuvant Chemotherapy (6 cycles)	23/04/2020 - 20/08/2020	Paclitaxel 295 mg Carboplatin 5 AUC	Complete response Remission 16 mth.
Relapse (CT proven)	18/12/2021		
1st line anti-relapse chemotherapy (3 cycles)	27/01/2022 - 29/03/2022	Paclitaxel 285 mg Cisplatin 110 mg	Disease Progression
2nd line anti-relapse Chemotherapy (3 cycles)	02/05/2022 - 16/05/2022	Docetaxel 120 mg Gemcitabine 1400 mg	Partial response
Secondary Cytoreduction + HIPEC	11/07/2022	HIPEC: cisplatin 170mg, 90 min, t= 43.5 °C)	Complete cytoreduction (CC0)
Adjuvant Chemotherapy	15/08/2022 - 30/09/2022	Docetaxel 120 mg Gemcitabine 1400 mg	Complete response Remission 11 mth.
Repeated relapse (CT proven)	20/08/2023		
3rd Line Palliative Chemotherapy (6 cycles)	31/08/2023 - 15/12/2023	Docetaxel 100 mg Gemcitabine 1200 mg	Stabilization of disease
Hormone Therapy	02/01/2024 - 10/05/2024	Tamoxifen 60 mg orally once daily	Disease Progression
4th Line Palliative Chemotherapy (5 cycles)	22/05/2024 - 28/08/2024	Topotecan 2.5 mg (days 1-5)	Disease Stabilization
5th Line Palliative Chemotherapy (3 cycles)	26/09/2024 - 22/11/2024	Liposomal Doxorubicin 70-52.5 mg	Disease Progression
6th Line Palliative Chemotherapy (6 cycles)	25/12/2024 - 21/05/2025	Pemetrexed 800 mg Carboplatin 5 AUC	Disease Stabilization

the follow-up visit on July 2, 2025, during the examination, the patient's condition improved significantly, shortness of breath and cough disappeared, and appetite improved. The follow-up examinations (CT scan of the chest, abdomen, pelvis with contrast, CA-125) were recommended for a month.

The main steps of the patient's treatment were summarised in Table 1.

For evaluation of the distress level during the treatment, the Ukrainian version 2.2022 of the NCCN Distress Thermometer (DT) questionnaire was used. This one-item questionnaire uses a Likert scale from 0 (no problems) to 10 (extreme distress), which resembles a thermometer. It also includes a problem list updated by the NCCN working group (Problem list). Patients rated their level of distress over the past week. They also checked the list of concerns about any of the items: physical, emotional, social, spiritual/religious, and practical from the proposed list [8]. Our patient rated her distress level as "2" after the completion of successful secondary cytoreduction with HIPEC and adjuvant chemotherapy. So, during the remission period, the level of distress was below the threshold. However, at the time of the second relapse, the patient rated the level of distress as "6". In the "Problem List," she noted pain, sleep disturbances, fatigue, sexual health disturbances, changes in eating, depression, anxiety, sadness, loss of interest, and dissatisfaction in relationships with her partner. After the treatment of repeated relapse and the last 6th-line chemotherapy, she rated her distress level as"4". Currently psychological condition of the patient can be defined as stable. Though there are occasional episodes of anxiety related to the side effects of chemotherapy (e.g., nausea, fatigue, alopecia, or others). The patient attends weekly sessions with the psychologist.

Discussion

This case illustrates the complexity of managing recurrent ovarian cancer in the late stages. At regular follow-up examinations during treatment, the results of CT scans and CA-125 levels enabled the timely detection of recurrence and the selection of the most appropriate treatment at each step (chemotherapy or surgery). A multimodal approach, including surgical cytoreduction, HIPEC, multiple lines of chemotherapy, hormonal therapy, and correction of side effects, allowed for to achievement of disease stabilization and maintenance of a satisfactory quality of life. Immunohistochemical (IHC) analysis allowed for personalized therapy by introducing tamoxifen; however, negative results for PR, HER2/neu, and MSI limited the possibilities for other targeted and immunotherapeutic approaches. The molecular profiling of recurrent tumors, identifying the foci of serous low-grade carcinoma with KRAS mutation, explained the resistance to platinum-based chemotherapy. However, the detection of KRAS mutation and hormone sensitivity of the recurrent tumor opened the opportunities for personalized treatment, although disease progression required a rapid change in therapeutic strategy. The identification of the KRAS mutation (c.35G>C, p. Gly12Ala, AF: 32.34%) indicated potential targeted approaches, but at the time of treatment, specific inhibitors for KRAS G12A were not yet available for clinical practice [5-7].

Conclusion

The management of recurrent ovarian cancer requires an integrated approach, including surgical, chemotherapeutic, and targeted methods. Regular monitoring of tumor markers, CT scans, immunohistochemical, and molecular genetic data is key to the timely detection of progression and correction of therapy. This case highlights the importance of molecular profiling and individualization of treatment to improve outcomes.

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