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Case Report **Pharmacy**

Bevacizumab with Paclitaxel and Carboplatin as Neo Adjuvant Chemotherapy for Stage 4 Ovarian Cancer- Case Report

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Abstract

Ovarian cancer, the fifth most common neoplasia in women, presents challenges in diagnosis and treatment, often resulting in poor prognosis due to advanced stage at diagnosis and limited treatment options. Platinum-based chemotherapy and surgery have been the mainstay treatments, but efforts to improve outcomes with additional cytotoxic drugs have yielded mixed results. Angiogenesis plays a crucial role in tumor growth and metastasis, leading to the investigation of bevacizumab, a monoclonal antibody targeting vascular endothelial growth factor (VEGF). Clinical trials have demonstrated its efficacy in delaying disease progression in ovarian cancer. This case report illustrates the successful use of neoadjuvant chemotherapy followed by surgery and maintenance therapy with bevacizumab and olaparib in a patient with advanced ovarian cancer, highlighting the potential benefits of this treatment approach in improving survival outcomes.

Keywords: Ovarian cancer, platinum-based chemotherapy, neoadjuvant chemotherapy, bevacizumab, maintenance therapy, BRCA mutations.

INTRODUCTION

The fifth most common neoplasia in women is ovarian cancer. It is the most common cause of mortality from gynecologic cancer [1]. Usually, the advanced stage at diagnosis and inadequate chemotherapy are to blame for the poor prognosis [2]. For the past ten years, platinum-based chemotherapy and surgery have been the go-to treatments for women with advanced ovarian cancer [3]. Neoadjuvant chemotherapy (NACT) combined with delayed surgery is an alternate treatment option for individuals with broad and severe tumor spread [1]. Attempts had made to improve this standard two-drug chemotherapy by adding a third cytotoxic drug but results in increased toxic effects and no change in progression free survival [3].

Growth and metastasis of solid tumors are aided by angiogenesis. Vascular endothelial growth factor is widely expressed by epithelial ovarian cancer cell lines (VEGF). Reduced VEGF expression is linked to decreased tumor angiogenesis and vascularization as well as longer life [3]. Bevacizumab (Avastin, Roche) is a monoclonal antibody with evidence of efficacy in metastatic colorectal and lung cancers as well as action in renal, breast, and brain malignancies. It binds to all isoforms of the VEGF-receptor ligand VEGF-A [4]. Phase 2 trials of bevacizumab in women with ovarian cancer have shown tumor responses and delayed disease progression [3].

CASE REPORT

A 58-year-old post-menopausal woman, who presented with abdominal distention, difficulty in swallowing, abdominal pain, early satiety leading to decreased appetite for 2 months. She is a chronic known case of depression and psychosis on medication. She had a history of pulmonary TB in childhood. On examination she had pallor, on abdominal examination she had gross ascites with tense skin and prominent veins. No organomegaly.

On chest auscultation left lung mild crepitations were heard anteriorly and posteriorly in all lung fields. She was worked up with CECT of abdomen was taken.

The CT scan showed large irregular left ovarian solid- cystic lesion, multiple peritoneal deposits,

calcified uterine fibroid and a 4 mm nodule present in the left lower lobe of lungs and single liver metastasis.

CT guided biopsy was obtained, and impression of histopathology suggested papillary serous adenocarcinomatous carcinoma ovary. Immunohistochemistry shows WT1 and p53 positive in tumor cells. CA 125 was found to be 2284 U/ml. Considering her age, stage of cancer she was advised neoadjuvant chemotherapy with paclitaxel 260 mg IV, carboplatin 410 mg IV along with bevacizumab 300 mg IV. She underwent 6 cycles of chemotherapy from January to April 2022. Later she was revaluated for surgery.

On whole-body FDG PET CT scan done before the surgery revealed primary mass and omental nodules had decreased, liver lesions were not visualized as compared to the CT scan done prior.

The CA 125 had dropped to 45.64 U/ml. Surgical oncology evaluation was done and she was taken up for total abdominal hysterectomy with bilateral salpingo-oophorectomy. Total omentectomy, right and left sub diaphragmatic peritoneum, bladder peritoneum, right and left PLND and PALND. The size of the tumor was about 6x3x2.8 cm. Complete cytoreduction was done.

The patient recovered and undergoing maintenance treatment on Bevacizumab 300mg IV and HRD mutation panel was sent for BRCA mutations. The test result shows HRD status positive with variant of uncertain significance. Therefore, patient was given T.Olaparib 150 mg 2-0-2 along with Bevacizumab on maintenance.

DISCUSSION

Bevacizumab, a humanized monoclonal antibody binds to all circulating, soluble VEGF – A isoforms. It blocks the interaction by binding to VEGF – A. Thus VEGF – A inhibits the activation of VEGF signaling pathways that encourage neovascularization by binding to VEGFR. Bevacizumab has been shown in in-vivo experiments to directly affect tumor cells by inhibiting vessel growth, causing regression of newly created vessels, and normalizing the vasculature to allow the delivery of cytotoxic chemotherapy [6]. In phase 3 ICON 7 trial, it was found that bevacizumab (7.5 mg/kg) given concurrently with 5 or 6 cycles of platinum-based chemotherapy and continued for an additional 12 cycles improved progression- free survival by about 2 months and increase the response rate by 20% [3]. The standard treatment option for people with newly discovered advanced ovarian cancer is the antiangiogenic drug bevacizumab added to carboplatin plus paclitaxel, then bevacizumab alone [5]. In a recent phase 3 SOLO 1 trail, patients with newly diagnosed advanced ovarian cancer who had tumors with a BRCA 1 and BRCA 2 mutation and who had a complete or partial clinical response to platinum-based chemotherapy benefited significantly from using the PARP (Poly (adenosine diphosphate-ribose) polymerase) inhibitor Olaparib as maintenance therapy [7].

CONCLUSION

In conclusion, administering maintenance Olaparib along with bevacizumab after platinum-based chemotherapy to patients with newly diagnosed advanced ovarian cancer who were receiving the standard treatment results in better survival.

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