Major Clinical Impact of Platinum-Based Chemotherapy in a Patient with a Borderline Ovarian Cancer

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Key Words

Borderline ovarian cancer · Chemotherapy of ovarian cancer · Carboplatin

Abstract

A patient with extensive and painful chest wall involvement from a metastatic borderline cancer of the ovary was treated with a carboplatin plus paclitaxel chemotherapy regimen. She achieved a rather dramatic improvement of pain control, a significant biochemical response with 75% reduction of the CA-125 antigen level, but only limited radiographic tumor regression. This experience emphasizes the potential clinical utility of platinum-based cytotoxic chemotherapy in the setting of symptomatic advanced borderline ovarian cancer.

Epithelial ovarian cancer is among the most chemotherapy sensitive solid tumors with anticipated major objective response rates of 70–80% to several primary platinum-based combination chemotherapy regimens [1]. Even in the setting of recurrent disease, patients who have not received chemotherapy for more than 18 to 24 months may be anticipated to achieve partial remission rates of more than 60% following reintroduction of this class of cytotoxic drugs [2–4]. Further, available data document the biological and clinical activity of a number of non-platinum-based strategies in both the recurrent and platinum-resistant settings, as well as the favorable impact of such treatment on overall survival [5–8].

However, for one group of epithelial ovarian malignancies there remains uncertainty regarding the benefits associated with the administration of cytotoxic anti-neoplastic agents, including the platinum drugs.

Most borderline ovarian cancers present at an early stage where surgical treatment alone is curative in the large majority of cases [9–11]. However, this malignancy can progress in a manner essentially identical to that observed with the higher-grade epithelial

cancers involving this organ, despite the fact that patients with this condition generally exhibit a far more indolent natural history even when initially presenting at an advanced stage [10–13].

Although limited evidence to the contrary exists [14], considerable published literature has questioned the clinical utility associated with the administration of chemotherapy to women with borderline ovarian cancers [14–16]. The essential argument is that the anticipated very low objective response rate and uncertain impact of anti-neoplastic drug treatment on survival leads to the suggestion that patients are unlikely to benefit from cytotoxic chemotherapy [14–16]. These conclusions are supported by data demonstrating the quite modest activity of current chemotherapy in low-grade serous ovarian cancer [17].

A recently managed patient with extensive chest wall involvement from a metastatic borderline ovarian tumor challenges this negative perspective, at least as regards the potential favorable impact of cytotoxic chemotherapy in the provision of symptomatic relief and substantially influencing overall clinical management.

Case History

The patient, a 39-year-old female, was diagnosed with a right-sided ‘large cystic tumor’ in 1994, and treated with a unilateral salpingo-oophorectomy. (Note: Review of the pathology from this surgery was not available.) A left-sided salpingo-oophorectomy was performed in 2004, which revealed a borderline serous papillary tumor. The histologic diagnosis was reviewed and confirmed by a nationally recognized gynecologic pathologist.

Recently, the patient developed a palpable and painful posterior chest wall mass over a period of several months. A core biopsy confirmed similar histology to the previously documented borderline ovarian cancer. A CT scan showed a large, multi-lobular, infiltrating mass (>10 cm) with involvement of the chest wall muscles and adjacent rib. Following discussions with the patient and several consultant physicians, a surgical resection was entertained and neo-adjuvant chemotherapy was recommended to debulk the tumor mass prior to local therapy (surgery and/or external beam radiation).

After the first cycle of carboplatin and paclitaxel chemotherapy, the local pain was largely resolved. After the second cycle, the discrete mass was no longer palpable by physical examination, although the ill-defined localized fullness persisted. The serum CA-125 antigen level has consecutively decreased from 306 prior to chemotherapy to 86 after the fourth cycle. The CT scan after the fourth cycle showed less than 25% reduction in the measurable size of the tumor. The patient tolerated chemotherapy well, with a grade 1 sensory neuropathy after the third cycle, and remained free of pain medication after the second cycle. The patient was very encouraged psychologically and physiologically by the pain relief. The current plan is to complete six cycles of chemotherapy, followed by a surgical resection, and adjuvant external beam radiation to achieve an optimal local control.

Discussion

Previously reported data have identified the relatively long natural history associated with the diagnosis of an advanced borderline tumor of the ovary [10–13]. While it has been shown that cytotoxic chemotherapy may produce objective tumor regressions [14, 15], the impact of treatment on a responding patient’s ultimate outcome is uncertain.

In the patient reported here, cytotoxic chemotherapy was employed both to achieve relief of painful symptoms and to facilitate an optimal local management. It is important to acknowledge that it is unknown whether a subjective and biochemical response will translate into a favorable impact on overall survival. However, the case emphasizes that

combination chemotherapy can provide significant improvement in cancer-associated symptoms in advanced borderline tumor of the ovary.

References

- 1 Covens A, Carey M, Bryson P, Verma S, Fung Kee FM, Johnston M: Systematic review of first-line chemotherapy for newly diagnosed postoperative patients with stage II, III, or IV epithelial ovarian cancer. *Gynecol Oncol* 2002;85:71–80.
- 2 Markman M, Rothman R, Hakes T, Reichman B, Hoskins W, Rubin S, Jones W, Almadrones L, Lewis JL Jr: Second-line platinum therapy in patients with ovarian cancer previously treated with cisplatin. *J Clin Oncol* 1991;9:389–393.
- 3 Rose PG, Fusco N, Fluellen L, Rodriguez M: Second-line therapy with paclitaxel and carboplatin for recurrent disease following first-line therapy with paclitaxel and platinum in ovarian or peritoneal carcinoma. *J Clin Oncol* 1998;16:1494–1497.
- 4 Dizon DS, Dupont J, Anderson S, Sabbatini P, Hummer A, Aghajanian C, Spriggs D: Treatment of recurrent ovarian cancer: a retrospective analysis of women treated with single-agent carboplatin originally treated with carboplatin and paclitaxel. The Memorial Sloan-Kettering Cancer Center experience. *Gynecol Oncol* 2003;91:584–590.
- 5 Rose PG, Blessing JA, Mayer AR, Homesley HD: Prolonged oral etoposide as second-line therapy for platinum-resistant and platinum-sensitive ovarian carcinoma: a Gynecologic Oncology Group study. *J Clin Oncol* 1998;16:405–410.
- 6 Gordon AN, Fleagle JT, Guthrie D, Parkin DE, Gore ME, Lacave AJ: Recurrent epithelial ovarian carcinoma: a randomized phase III study of pegylated liposomal doxorubicin versus topotecan. *J Clin Oncol* 2001;19:3312–3322.
- 7 Markman M, Blessing J, Rubin SC, Connor J, Hanjani P, Waggoner S: Phase II trial of weekly paclitaxel (80 mg/m²) in platinum and paclitaxel-resistant ovarian and primary peritoneal cancers: a Gynecologic Oncology Group study. *Gynecol Oncol* 2006;101:436–440.
- 8 Creemers GJ, Bolis G, Gore M, Scarfone G, Lacave AJ, Guastalla JP, Despax R, Favalli G, Kreinberg R, Van BS, Hudson I, Verweij J, ten Bokkel Huinink WW: Topotecan, an active drug in the second-line treatment of epithelial ovarian cancer: results of a large European phase II study. *J Clin Oncol* 1996;14:3056–3061.
- 9 Barnhill DR, Kurman RJ, Brady MF, Omura GA, Yordan E, Given FT, Kucera PR, Roman LD: Preliminary analysis of the behavior of stage I ovarian serous tumors of low malignant potential: a Gynecologic Oncology Group study. *J Clin Oncol* 1995;13:2752–2756.
- 10 Wong HF, Low JJ, Chua Y, Busmanis I, Tay EH, Ho TH: Ovarian tumors of borderline malignancy: a review of 247 patients from 1991 to 2004. *Int J Gynecol Cancer* 2007;17:342–349.
- 11 Trimble CL, Kosary C, Trimble EL: Long-term survival and patterns of care in women with ovarian tumors of low malignant potential. *Gynecol Oncol* 2002;86:34–37.
- 12 Lackman F, Carey MS, Kirk ME, McLachlin CM, Elit L: Surgery as sole treatment for serous borderline tumors of the ovary with noninvasive implants. *Gynecol Oncol* 2003;90:407–412.
- 13 Silva EG, Gershenson DM, Malpica A, Deavers M: The recurrence and the overall survival rates of ovarian serous borderline neoplasms with noninvasive implants is time dependent. *Am J Surg Pathol* 2006;30:1367–1371.
- 14 Barakat RR, Benjamin I, Lewis JL Jr, Saigo PE, Curtin JP, Hoskins WJ: Platinum-based chemotherapy for advanced-stage serous ovarian carcinoma of low malignant potential. *Gynecol Oncol* 1995;59:390–393.
- 15 Crispens MA, Bodurka D, Deavers M, Lu K, Silva EG, Gershenson DM: Response and survival in patients with progressive or recurrent serous ovarian tumors of low malignant potential. *Obstet Gynecol* 2002;99:3–10.
- 16 Gershenson DM, Silva EG, Levy L, Burke TW, Wolf JK, Tornos C: Ovarian serous borderline tumors with invasive peritoneal implants. *Cancer* 1998;82:1096–1103.
- 17 Gershenson DM, Sun CC, Bodurka D, Coleman RL, Lu KH, Sood AK, Deavers M, Malpica AL, Kavanagh JJ: Recurrent low-grade serous ovarian carcinoma is relatively chemoresistant. *Gynecol Oncol* 2009;114:48–52.