Prolonged survival after laparoscopic splenectomy for recurrent ovarian cancer and no adjuvant therapy: a report and review of the literature

Introduction

Isolated splenic recurrent ovarian cancer is uncommon and may present remotely from initial surgery and chemotherapy. Surgical excision remains the treatment of choice for this condition. While widely used, the role of adjuvant therapy in this situation is unclear. We present a case of isolated recurrent splenic ovarian cancer treated with surgery and no adjuvant therapy, and review the literature on management of this condition.

Case study

A 59-year-old woman underwent optimal surgical cytoreduction for stage IIIC serous papillary ovarian cancer. She subsequently received six cycles of carboplatin and paclitaxel. Her serum carcinoma antigen (CA)125, which had measured 349 U/ml (normal 0-35 U/ml), normalised after the third cycle of chemotherapy. She then had routine follow-up. Twenty-seven months later, despite being asymptomatic, the serum CA125 increased to 149 U/ml and a computed tomography scan noted a 30-mm lesion in the spleen (Figure 1). A positron emission tomogram (PET) scan confirmed a glucose-avid lesion in the spleen, with no evidence of metastatic disease elsewhere. The patient underwent a total laparoscopic splenectomy, with delivery of the spleen through a small left subcostal incision. The patient made an uneventful recovery. Final pathology revealed a spleen measuring 105 x 75 x 40 mm, weighing 120 g, with a 50 x 35 x 25-mm lobulated nodule distending into, but not grossly penetrating, the capsule. Microscopy showed grade 3 serous papillary cancer compatible with a metastatic ovarian tumour with negative margins, negative peritoneal washings and peritoneal biopsies. The CA125 returned to normal within a week of the operation. She chose not to have further chemotherapy, and she remains free of disease six years later.

Discussion

Our patient has had a prolonged remission following laparoscopic splenectomy for isolated recurrent ovarian cancer and no further adjuvant treatment. This
is the first case of isolated recurrent ovarian cancer, demonstrating prolonged survival after laparoscopic splenectomy, with no postoperative adjuvant therapy.

Isolated splenic recurrence of ovarian cancer is exceedingly rare. The ovary is the most common gynaecological site of origin of metastatic deposits in the spleen. Up to 9% of splenic lesions originate in the ovary. Previous reports of patients undergoing splenectomies for malignant disease have identified ovarian cancer as the most common site of origin of metastatic splenic tumours. A splenectomy is not infrequently required as part of a primary or secondary debulking procedure for epithelial cancer, and this is usually carried out in the context of peritoneal carcinomatosis. Sonnendecker et al reported that 7.6% of their patients with advanced disease required splenectomy, and despite utilisation of prophylactic

**Table I: Published series on the postsurgical management and outcomes of patients with isolated recurrence of ovarian cancer in the spleen**

| Author          | Cases | FIGO stage | Adjuvant therapy after first surgery | Time to recurrence | Adjuvant treatment | Follow-up |
|-----------------|-------|------------|-------------------------------------|--------------------|--------------------|-----------|
| Nosanchuk³      | 1     | N/A        | CTX + doxorubicin + CDDP            | 36                 | 5-FU + MTX         | N/A       |
| Minagawa¹⁰      | 1     | IIib       | N/A                                 | 60                 | 5-FU               | 12 NED    |
| Farias-Eisner¹¹ | 4     | IIIC (3 cases) | CTX + platinum                   | 18-120             | Radiotherapy (2 cases) | 6-36 NED |
|                 | IV (1 case) |           |                                     |                    |                    |           |
| Max¹²           | 1     | Ic         | N/A                                 | 30                 | N/A                | 6 NED     |
| Balat¹³         | 1     | IIIC       | CTX + CDDP                          | 66                 | CBDCA              | 6 AWD     |
| Kobayashi¹⁴     | 1     | III        | CDDP + epirubicin                   | 24                 | Paclitaxel + CDDP  | N/A       |
| Klingler¹⁵      | 1     | III        | N/A                                 | 24                 | N/A                | 6 NED     |
| Gemignani¹⁶     | 6     | III        | CTX + CDDP/CBDCA                    | 28-88              | Paclitaxel + CBDCA/CDDP | 6-65 NED |
|                 |       |            |                                     |                    | Tamoxifen (1 case) |           |
| Lauro¹⁷         | 1     | Ic         | CTX + radiotherapy                  | 180                | CBDCA + CTX        | 96 NED    |
| Yano¹⁸          | 1     | IIIC       | N/A                                 | 36                 | N/A                | N/A       |
| Koh²            | 1     | N/A        | N/A                                 | 12                 | Paclitaxel + CBDCA | 24 AWD    |
| Tserkezoglou¹⁹  | 1     | IIib       | CDDP                                | 24                 | CBDCA              | 20 NED    |
| Otrock²⁰        | 1     | IIa        | Paclitaxel + CBDCA                  | 84                 | Paclitaxel + CBDCA | 11 NED    |
| Furukawa²¹      | 1     | Ic         | N/A                                 | 108                | Paclitaxel + CBDCA | 60 NED    |
| Alloni²²        | 2     | IIIC       | Paclitaxel + CBDCA (1 case)         | 53 and 36          | Paclitaxel + CBDCA | 7 NED     |
|                 |       |            |                                     |                    | Adriamycin + CMF (1 case) |           |
| Yoshioka²³      | 1     | N/A        | N/A                                 | 33                 | Chemotherapy 24 months | 120 NED  |
| Izuishi²⁴       | 1     | IIc        | 5-FU + CTX + Adriamycin + CDDP      | 240                | N/A                | 60 NED    |
| Hasegawa²⁵      | 1     | Ib         | CTX + epirubicin + CDDP             | 151                | Paclitaxel + CBDCA | 24 AWD    |
| Suzumura²⁶      | 1     | IIc        | Paclitaxel + CBDCA                  | 84                 | Paclitaxel + CBDCA | 4 NED     |
| Pather (current case) | 1     | IIIC       | Carboplatin/ Paclitaxel X6          | 27                 | Nil                | 60 NED    |

5-FU: fluorouracil, AWD: alive with disease, CBDCA: carboplatin, CDDP: cisplatin, CMF: cyclophosphamide/methotrexate/fluorouracil, CTX: cyclophosphamide, FIGO: International Federation of Gynaecology and Obstetrics, MTX: methotrexate, N/A: received adjuvant therapy (specific details of adjuvant treatment not provided), NED: no evidence of disease
heparin, the risk of thrombocytosis and thrombosis remained significant. The spleen has long been regarded as an immunologically privileged site for cancer based on its lack of afferent lymphatics, its rhythmic contractile nature, the presence of immunocompetent splenic tissue with potential antineoplastic properties, and the acute angle of origin and tortuosity of the splenic artery. This may explain the rarity of splenic metastases in patients with ovarian cancer.

Previous cases of isolated splenic recurrent ovarian cancer are outlined in Table I. The mean time to detection of recurrence is 66 months. Elevated serum CA125 and imaging are usually used to confirm the diagnosis. Our patient was completely asymptomatic on presentation, as noted in some patients in previous studies. The most frequently used treatment was open splenectomy. All previous patients had chemotherapy or radiotherapy. Where stated, the median survival was 32 months.

Performance status, CA125 level on relapse; treatment-free survival; patient age; the presence or absence of ascites, the number of lesions, the distribution of tumours, and largest tumour size, on recurrence; and the ability to cytoreduce the tumours to no or minimal microscopic disease at secondary surgery are associated with improved outcomes following secondary cytoreductive surgery for recurrent ovarian cancer.

Previous cases of splenectomy carried out for recurrent ovarian cancer have been performed open or using total laparoscopic splenectomy. The benefits of laparoscopic splenectomy include a shorter hospital stay, less postoperative pain and lower blood loss. The major concerns associated with this procedure are the risk of splenic trauma, with dissemination of tumour cells, and difficulty in extracting the specimen, with contamination of the skin. The use of wound protectors, together with the ability to remove specimens intact in an endobag, has meant that these obstacles have been easily overcome. Port site recurrence in patients undergoing laparoscopic splenectomy for recurrent splenic ovarian cancer has not been described.

All patients with isolated splenic recurrences have received post-splenectomy adjuvant therapy. The benefit of adjuvant therapy in this situation is unknown, because of the rarity of solitary splenic metastasis. However, as the advent of the PET scan has facilitated sensitive detection of recurrent disease, the need for adjuvant therapy may be limited.

The isolated splenic recurrence of ovarian cancer is uncommon, but if detected and treated with surgical excision, it is associated with an excellent prognosis. Laparoscopic splenectomy is appropriate in this setting and does not increase the risk of port site recurrence. The use of adjuvant therapy in this setting is unclear, but may be withheld in the presence of a negative PET scan and with tumours that do not involve the capsule of the spleen.

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