Case Report

Laparoscopic port site metastasis 1 year after chemotherapy in a patient with ovarian cancer – a case report

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Abstract

Role of laparoscopy in treatment of gynecological cancers is growing enormously. The claimed benefits include shorter hospital stay, lesser degrees of morbidity. However, there are some disadvantages of laparoscopy, of which port site metastasis is a noted complication. Patients with extensive disease, as cites, peritoneal deposits are at risk of developing port site metastasis, and most of the reported cases have noted port site metastasis within 6 months of primary surgery. We report a case of port site metastasis in a 55 year old lady with epithelial carcinoma of ovary, which underwent laparoscopic procedure for interval debulking of the tumor following neoadjuvant chemotherapy. The metastasis occurred after one year of adjuvant chemotherapy, which is not a usual phenomenon.
Keywords: Metastasis; Laparoscopy; ovarian cancer.

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INTRODUCTION

Laparoscopy is a well explored modality for the diagnosis, staging and treatment of several oncologic pathologies. Claimed benefits include lesser morbidity, blood loss and shorter hospital stay. Various studies have demonstrated the safety and efficacy as a diagnostic modality and as an alternative for staging laparotomy in early ovarian cancers.[1-3] Port site metastasis remains a concern following laparoscopy in gynecological malignancies, with reported incidence varying from 1.1% to 16%, ovarian cancer accounting for 68% of the occurrences.[4]The largest review on laparoscopic port site metastases in gynaecological cancers observed that the median time to occurrence of port site metastasis is17 days, and 70 % of them occur in tissue-manipulating ports.[4]A literature search for " 'delayed' / 'late' port site metastasis in ovarian cancer" in medline yielded no accurate case report. Here we present a case of port site metastasis following laparoscopy for primary resection of ovarian carcinoma, which occurred 15 months after the surgery or 12 months after completion of chemotherapy, the metastasis having occurred at the camera port.

CASE REPORT

A 55 years old obese female with dermatomyositis was referred to our department 1 year 8 months back as a diagnosed case of epithelial carcinoma of the ovary post three cycles of neoadjuvant chemotherapy (NACT). Her initial CA 125 was 2270 U/ ml, and she had received three 3-weekly cycles of carboplatin (approximately 600mg/cycle) in conjunction with nanoparticle paclitaxel (approximately 390mg/cycle); the last dose administered just two weeks prior to registering with us. On presentation to our department, a repeat CT showed a decrease in size of the ovarian tumor by 80% along with decrease in size and number of peritoneal, omental, and

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nodal deposits, and complete radiological resolution of liver and sub diaphragmatic deposits. CA 125 had reduced to 93 U/ ml. In view of good response to NACT, we decided to go ahead with an interval surgery. Diagnostic laparoscopy to be followed by a laparoscopic/ open procedure as deemed necessary was planned. Entry was direct through modified Palmers point by closed technique without insufflation, with a 10mm trocar. Diagnostic laparoscopy revealed bilateral shrunken ovaries with necrotic deposits in the pouch of Douglas, the omentum, subdiaphragmatic region and the mesosigmoid. Decision was made to proceed laparoscopically. Three instrument ports, 5mm each, were placed; one on either flanks and third at suprapubic area. Total laparoscopic hysterectomy with bilateral salpingo-oophorectomy, pelvic lymph node dissection, infracolicomentectomy and tumor debulking was done. Specimens were retrieved vaginally. All port sites were closed with No.1 Vicryl using reverse cutting needle. The total duration of surgery was 4 hours, and the approximate blood loss was 300 ml. The procedure was performed under combined general and epidural anaesthesia. Postoperative period was uneventful with the patient being discharged on the third postoperative day. Final histopathology revealed residual poorly differentiated adenocarcinoma of both ovaries; bilateral tubes and omentum also showing tumor deposits. Adjuvant chemotherapy with the same pre-operative regime was restarted on the 11th postoperative day, and she received four cycles. A year after chemotherapy, routine follow up investigations revealed borderline elevated CA125 and a sonologically detected thin walled pelvic cyst with a suspicious solid component; but clinical examination was unremarkable. She was advised tamoxifen 20 mg bid. In her subsequent follow up, there was a clinically appreciable firm nodular subcutaneous mass with intact overlying skin at the site of the previous laparoscopy camera /entry port, with rising CA 125 value. CT revealed focal surface deposits on right lobe of liver and spleen, multiple peritoneal nodules, a cystic lesion in the pelvis, and an irregular cystic lesion of sixe 6.4cm x 6 cms along left lateral border of rectus sheath. Fine needle aspiration (FNAC) of the abdominal wall mass was positive for poorly differentiated carcinoma. She underwent secondary cytoreductive surgery involving tumor debulking, appendicectomy, splenectomy, supracolic omentectomy, subdiaphragmatic and abdominal wall deposit excision by laparotomy. The abdominal wall metastatic tumor was found to be pre-peritoneal in location at the port site, invading the rectus sheath, with intact overlying skin. At the time of this reporting, the patient is received adjuvant second line chemotherapy.

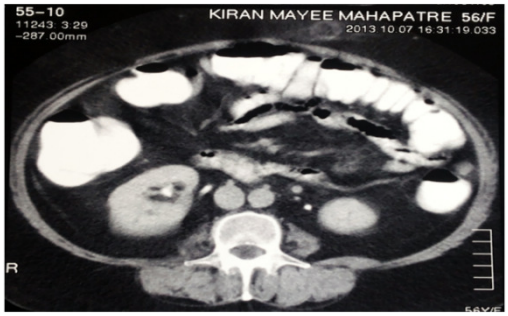

Figure 1: CT scan section showing abdominal wall metastasis along the lateral border of the rectus sheath on the left side

DISCUSSION

The role of laparoscopy in management of ovarian malignancy still appears growing, and may be useful in staging of apparently early ovarian cancer, assessing the disease extent and resectability, cytoreductive surgery and also for reassessment and second look operation to rule out recurrence. Recent literature shows that the laparoscopic staging of apparent early ovarian cancer is as effective as conventional laparotomy, with the added benefit of minimally invasive surgery.[1,2] The laparoscopic approach, compared to the open approach, has traditionally been associated with decreased length of hospital stay, better cosmetic results, fewer postoperative complications, faster return to normal activities with reduced analgesic requirements, and hence decreased cost of care. Despite these advantages, the role of laparoscopy inoncologic surgery has always been a topic of much debate. Lack of tactile assessment, lack of 3D vision, poor assessment of depth of infiltration and doubts about the true extent of resection have all been traditionally thought to compromise the principles of oncologic surgery. The other major factor raised against the laparoscopic approach is the development of port-site metastasis. The first case of port site metastasis reported by Dobronte and colleagues described the case of a patient developing metastases in the abdominal wall two weeks after laparoscopy.[5]The reported incidence rates of port site metastasis following laparoscopic procedure for primary or recurrent ovarian cancer vary from 1.4% (Childers *et al*) to 9% (van Dam *et al*)[6,7]In a retrospective study by Nagarsheth *et al* to determine the incidence of port site metastasis among all gynecological cancers, port site metastasis per procedure was observed to be 2.3% and 2.4% per port placed, all the metastases having occurred only in ovarian cancers at a rate of 6.8%.[8] The most commonly discussed hypotheses regarding the occurrence of port site metastases include haematogenous and lymphatic dissemination; tumor cell implantation at port site; tumor spillage while lavage and retrieval of specimen; the effects of pneumoperitoneum including

peeling and destruction of the muscular layer of the abdominal peritoneum, increased blood flow along anterior abdominal wall and sloughing or shedding of tumor cells from viscera into the peritoneal cavity; "chimney effect" that occurs when gas leaks out along the trocar; and the transient suppression of peritoneal cell – mediated immunity due to lympho-cytotoxic property of carbon dioxide.[9-11] Arguably, the strongest risk for port-site metastasis would be the surgical technique, as is evidenced by the high occurrence of port-site metastasis in the early 1990s during the early learning curve of laparoscopic surgeons in comparison to contemporary statistics. The type of gas has also been linked to rates of port-site metastasis, with argon and nitrogen more likely to be associated with port-site metastasis, and helium least likely.[12]Chaturvedi and colleagues proposed that port site metastasis is least affected by laparoscopic factors, but is rather a consequence of haematogenous spread of tumor cells.[13] As per a review of 31 articles involving 58 reported cases of laparoscopic port site metastases in gynecological cancers compiled by Ramirez *et al*, 68% of the metastases were observed in ovarian cancer patients, followed by cervical (20%) and uterine cancers. 83% of those patients had advanced (stage III or IV) disease, and71% had as cites. Median time to diagnosis of port-site metastases was 17 days (range: 4-730).[4] Wang *et al* observed that specific factors significantly associated with the early occurrence of port site metastases among all gynecological cancers included the diagnosis of ovarian malignancy, the presence of as cites, and non-curative surgery.[14]The striking differences in the present case from existing literature include the delay in the occurrence of port site metastasis and its occurrence in the absence of as cites and despite curative surgery and prompt timely administration of adjuvant chemotherapy. The last mentioned exception may imply a "sanctuary effect" whereby the port site may act as a sanctuary for tumor cells to proliferate and remain inaccessible to chemotherapy as a chemo-privileged site.[15]In the light of such a possibility, the author would like to suggest that intraperitoneal chemotherapy may be preferred over intravenous mode following laparoscopic surgery in patients with risk factors for port site metastasis. The clinical significance of port site metastasis lies in the fact that it is a strong risk factor for peritoneal dissemination.[15]Clinical work-up of the patient with port site metastasis should ideally comprise of positron emission tomography scan or contrast enhanced computed tomography to identify for other sites of metastasis. In the absence of distant metastasis, a wide excision of the port site together with a laparoto my to survey the peritoneal cavity and cytoreductive surgery if warranted, should be performed, along with perioperative intraperitoneal chemotherapy.[15]Zivanovic *et al* reported that among 20 of 1694 patients developing port-site metastasis after laparoscopic procedures for gynecologic malignancies, those patients who developed port-site metastasis within 7 months from the laparoscopic procedure had a median survival of 12 months compared to 37 months for patients who develop port-site metastasis after 7 months (P=0.004).[16] Research is ongoing, to prevent or delay the occurrence of port site metastasis following laparoscopy. The various preventive methods suggested are gasless laparoscopy, protected puncture of ovarian cyst, resection without rupture of an ovarian cyst, extensive washing in case of rupture, minimal tumor manipulation, use of protective bags for tissue retrieval, irrigation of ports with heparin or povidone-iodine solution before removal, wound closure in layers (peritoneum, rectus fascia, and skin) over skin closure alone, the use of intraperitoneal cytotoxic agents, peritoneal lavage with heparin in order to avoid adhesion of free cells and early onset of postoperative chemotherapy.[6,7,14,17-19]

CONCLUSION

Port-site metastasis is a rare yet potential complication of laparoscopic oncological procedures. Surgical technique, presence of as cites, advanced disease and ovarian cancer are the most important influencing factors. Median time to occurrence is 17 days, and late occurrences though rare have been reported as late as 730 days. This highlights the need for prolonged vigilant surveillance and high index of suspicion. Management involves imaging work up followed by debulking surgery and adjuvant chemotherapy, preferably intraperitoneal. Preventive measures are under research

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