



Port-site Metastasis After Laparoscopic Subtotal Gastrectomy in Gastric Cancer: An Uncommon Case Report

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We present a case of port-site metastasis in a 60-year-old Taiwanese woman who underwent laparoscopic gastrectomy. Seventeen months after surgery, the patient presented with a firm mass (4 cm × 4 cm in size) over the site of the umbilical surgical wound. Wide excision of the umbilicus was performed. Histological examination of the excised mass showed umbilical adenocarcinoma with no evidence of peritoneal nodules, and the patient was discharged to receive further chemotherapy treatment. After 15 months of follow-up, there was no indication of tumor metastasis.

Key words: Adenocarcinoma, gastric cancer, laparoscopy, port-site metastasis

INTRODUCTION

Port-site metastasis has been documented for malignancies with an estimated incidence of about 1–2% for patients undergoing laparoscopic surgery.¹ In 1978, Döbrönte *et al.* described a “port-site” tumor implant in a patient with malignant ascites 2 weeks following laparoscopy.² In another report, eight local recurrences in 1098 laparoscopic procedures for urologic malignancies were described.³ Table 1 summarizes published reports of port-site metastases following laparoscopic surgeries.

Etiologic factors of port-site metastasis include direct wound contamination, immune status, laparoscopy-related factors (use and type of gas, insufflation, desufflation, and pneumoperitoneum), and experience of the surgical team.⁹ We reported the case of a 60-year-old Taiwanese woman with port-site metastasis after laparoscopic gastrectomy.

CASE REPORT

A 60-year-old woman from Taiwan presented to the clinic with an umbilical surgical wound. The woman had ovarian tumor surgery and radiotherapy treatment 30 years ago. This

time, she presented with adenocarcinoma of stomach, T3N0M0, Stage IIA, and underwent laparoscopic subtotal gastrectomy, D2 lymph nodes dissection, and further cholecystectomy 1 month later.

Seventeen months after surgery, the patient presented with a hard lump over the umbilical surgical scar. She was admitted to the ward for further evaluation, and a wide excision procedure was performed.

A firm mass with mild erythematous change, nontender, about 4 cm × 4 cm in size that had invaded into the parietal peritoneum was revealed on examination [Figure 1a]. After wide excision, no peritoneal nodules were found [Figure 1b]. The wound was closed layer by layer with retention sutures and nylon sutures. Histopathology revealed a metastatic adenocarcinoma and was suspected to stem from the gastrointestinal tract [Figure 1c]. The final diagnosis was metastatic adenocarcinoma of the umbilicus. The patient was discharged from hospital 1 week later for further chemoradiotherapy treatment. She was followed-up after 15 months. However, no evidence of tumor metastasis was noted at any site.

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Port-site metastasis after gastrectomy

Table 1: Representative reports of port-site metastasis following laparoscopic surgery: Incidences of port-site metastasis showed wide variation in terms of time to recurrence, the primary malignancies, and laparoscopic procedures used

Authors	Type of tumor	Initial pathological stage and type	Procedure	Interval between surgeries and metastasis (months)	Port-site recurrence	Number of cases
Sakurai <i>et al.</i> , 2013 ⁴	Gastric cancer	Type 3, cTNM stage II; T2 N0 M0	Laparoscopic-assisted distal gastrectomy	18	Left lower quadrant trocar site	1
Kim <i>et al.</i> , 2015 ⁵	Gastric cancer	Borrmann-I gastric carcinoma T3 N0 M0	Laparoscopic-assisted distal gastrectomy	6	Right lower quadrant port insertion site	1
Lee <i>et al.</i> , 2007 ⁶	Gastric cancer	Adenocarcinoma stage IIIB	Laparoscopic-assisted total gastrectomy	12	Left lower quadrant at port-site	1
Chaturvedi <i>et al.</i> , 2012 ⁷	Prostate cancer	Adenocarcinoma PT3N1M0 Gleason 3+5	Laparoscopic radical prostatectomy	5	Left working port	1
Chaturvedi <i>et al.</i> , 2012 ⁷	Renal cancer	Localized renal cell carcinoma	Laparoscopic radical nephrectomy	7–36	Camera port at umbilicus, right working port, nonworking port	4
Chaturvedi <i>et al.</i> , 2012 ⁷	Bladder cancer	Mucinous adenocarcinoma	Laparoscopic partial cystectomy	13	Right working port	1
Furukawa <i>et al.</i> , 2014 ⁸	Ovarian tumor	Stage IA borderline mucinous ovarian tumor	Laparoscopy	26	Umbilicus	1

cTNM=Clinical tumor-node-metastasis

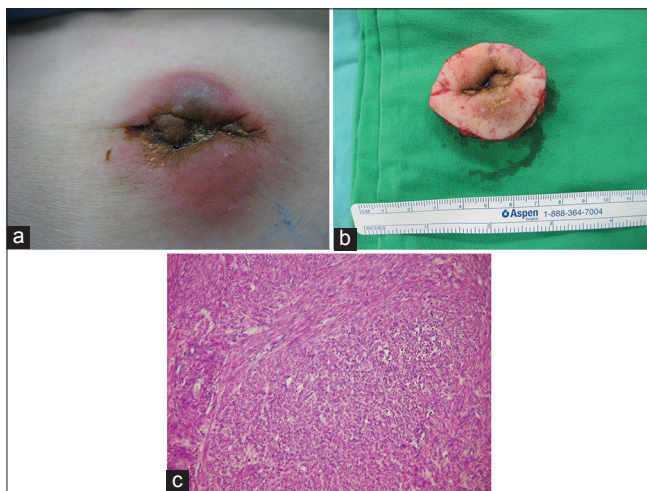


Figure 1: (a) A firm mass with mild erythematous change, nontenderness, is about 4 cm × 4 cm in size, over para-umbilical region. (b) The tumor mass lesion with invasion of parietal peritoneum after wide excision. (c) Microscopically, histopathology characterized by pleomorphic tumor cells with prominent nucleoli and frequent mitoses arranged in fused glandular pattern infiltration

DISCUSSION

Recurrence of adenocarcinoma within port-sites following laparoscopic resection has been documented at frequencies of about 1–5% for gastrointestinal malignancies and 1–14% for ovarian malignancies.¹⁰ The incidence of port-site metastasis is higher when the tumor is manipulated. However, the true incidence and the actual number of such recurrences are unknown.

There have been several reports of carcinoma recurrence at port-site after laparoscopic surgery involving cancers

of different organs [Table 1]; thus, several authors have questioned the effectiveness of laparoscopic surgery in the management of malignancies.^{8,11} Furukawa *et al.* described a case of port-site metastasis after laparoscopic surgery for borderline mucinous ovarian tumors.⁸ However, laparoscopic surgery has several advantages such as better tumor staging, lesser pain, quicker recovery, and shorter hospitalization.¹²

We report a very rare case of port-site metastasis after laparoscopic surgery for gastric cancer. The published literature suggests that umbilical neoplasms represent only one-fourth or one-sixth of the metastatic tumors at the same location.¹³ Furthermore, there have been reports of adenocarcinomas of the umbilicus that produce subcutaneous nodules or intestinal-like epithelial structures,¹³ as in the present case, these are very rare. The patient showed no recurrence at the 15-month follow-up visit.

The removal of tumors during surgery, particularly laparoscopy, without spilling of cyst contents is critical to prevent metastasis.¹⁴ If there is tumor exposure during laparoscopic procedure or manipulation of the stomach during the operation, we should use wound protector or tissue endobag for preventing tumor exposure or contamination over the umbilical wound while removal of the specimen from abdominal cavity. In our case, the specimen of the gastric tumor was large; therefore, we used the wound protector on the trocar site of the umbilical wound on the abdomen, instead of using the tissue bag. The risks of port-site metastasis following laparoscopic surgery are also influenced by factors such as the use of carbon dioxide for insufflation, leakage of gas around the trocars leading to aerosolization of tumor cells at the port-sites, local immune system effects, surgical technique,

potential for direct contamination of the trocar site with viable tumor cells, and presence of ascites.^{1,15,16}

Several measures have been suggested to prevent port-site metastasis including sufficient technical preparation, avoidance of laparoscopy if ascites are present, trocar fixation with avoidance of gas leakage, use of a bag for intact specimen removal, povidone-iodine irrigation of laparoscopic instruments, trocar and port-site wounds, intraperitoneal irrigation with chemotherapy solution, and closure of the peritoneal defect.⁹ A study showed a 50% decrease in the incidence of port-site metastases when preventive measures were taken, and the risk of developing port-site recurrence was reduced by 7.7-fold.¹⁷

CONCLUSION

We suggest that laparoscopic surgery should be avoided in patients with advanced malignancies such as intra-abdominal carcinomatosis. Surgeons should carefully extract tumors during surgery, particularly laparoscopic procedures without spilling tumor cells or cyst contents. Patients undergoing laparoscopic surgery for treatment of their malignancies should be followed-up for longer periods so that any occurrence of port-site metastasis might be detected at an early stage.

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Conflicts of interest

There are no conflicts of interest.

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