Abdominal wall port-site metastasis after hand-port assisted laparoscopic splenectomy in recurrent cervical cancer

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Abstract We reported an unusual case of abdominal metastasis after hand-assisted laparoscopic splenectomy in a patient with recurrent cervical cancer. A 50-year-old woman who had been diagnosed with the International Federation of Gynecology and Obstetrics (FIGO) stage IIa squamous cell carcinoma (SCC) of the cervix was treated by radical hysterectomy. A five-year follow-up examination revealed recurrence in the spleen. Hand-assisted laparoscopic splenectomy was performed. Twelve months later, a suspicious lesion was found in the patient's left abdomen at the site of the hand-port scar. An abdominal wall tumor was excised, and histologic examination confirmed recurrence of the SCC. Although the tumor was completely removed, colon, stomach, skin and abdominal wall metastasis occurred within 4 months. The patients received palliative chemotherapy and radiotherapy but succumbed to the disease 7 months after the second recurrence. Laparoscopic surgery is widely used because of its relatively low complication rate and short recovery time. However, we must be aware of the

possibility of laparoscopy-related hand-port or trocar site tumor recurrence in the abdominal wall for which the treatment response and prognosis can be poor.

Keywords Cervical cancer · Port-site recurrence · Hand-port assisted laparoscopic surgery (HALS)

Introduction

With widespread use of laparoscopy in the management of abdominal/pelvic malignancies over the past decades, port-site metastasis after laparoscopic surgery has been of great concern. The reported incidence of port-site metastasis in cases of gynecologic malignancy is 1–2 % [1]. Such metastasis has been reported mainly after surgery for ovarian carcinoma, and only rarely after surgery for cervical cancer [2]. Herein, we describe an unusual case of abdominal metastasis after hand-assisted laparoscopic splenectomy in a patient with recurrent cervical cancer.

Case report

A 50-year-old Taiwanese woman who, 5 years previously, had undergone radical hysterectomy, bilateral salpingo-oophorectomy and pelvic lymphadenectomy followed by adjuvant radiation for stage IIa squamous cell carcinoma, came to us for a regular follow-up examination. Her serum squamous cell carcinoma (SCC) antigen level was elevated at 7.7 ng/mL (normal value <1.5 ng/mL). Computed tomography (CT) and whole body positron emission tomography (FDG-PET) revealed isolated metastatic nodules in the spleen. Magnetic resonance imaging and the FDG-PET showed no local recurrence in the pelvic space including the vaginal stump. Hand-assisted laparoscopic

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Fig. 1 Front view of the spleen excised via hand-assisted laparoscopic splenectomy. Tumor mass is visible near the splenic hilum

splenectomy was performed via an incision on the left side of the abdomen at the area over the spleen. A hard, whitish, unencapsulated tumor measuring 5×4 cm was found at the upper pole of the spleen, and involved the fundus, diaphragm and Gerota's fascia (Fig. 1). Metastatic poorly differentiated SCC was confirmed in the excised spleen. External beam radiotherapy was performed concurrent with weekly administration of 50 mg cisplatin; the radiation was delivered at the splenic hilum and tumor bed to a total dose of 5040 CGy in 28 fractions.

Twelve months later, a palpable mass was found on the left side of the patient's abdomen overlying the hand-port placement site. The CT revealed a prominent soft tissue mass 6.5 cm in diameter at the left abdominal rectus muscle (Fig. 2). The abdominal wall tumor was excised en bloc. Pathologic examination showed the tumor to be a recurrence of the SCC, this time invading skeletal muscle (Fig. 3). There was no evidence of recurrence within the peritoneal cavity.

Four months after surgery, CT revealed metastasis to the skin, abdominal wall, stomach and colon. The patient received palliative chemotherapy and radiotherapy but succumbed to the disease 7 months after diagnosis of the second recurrence.

Surgical procedure

The patient was placed in the spine position with 20° elevation on the left side. A left hand-assist device (Omniport,

Fig. 2 CT image showing port-site metastasis in the left abdominal wall (arrow). The prominent soft tissue mass at the left abdominal rectus muscle (6.5 cm) was considered a tumor recurrence

Fig. 3 Abdominal wall tumor examined microscopically shows squamous cell carcinoma invading skeletal muscle (hematoxylin and eosin stain, $\times 20$ magnification)

Advanced Surgical Concepts Ltd., Ireland) was placed into a 7–8 cm upper midline abdominal incision for creation of an airtight system that would allow introduction of the surgeon's nondominant hand into the abdominal cavity. Three incisions were made for portal access, including a supraumbilical incision for insertion of instruments, at an appropriate distance from the subcostal margin. Carbon dioxide insufflation was maintained at a pressure of 12–14 mmHg. The spleen was mobilized in a manner similar to that in open splenectomy, beginning with dissection and division of the splenocolic ligament with a

harmonic scalpel, followed by gradual dissection and division of the gastrosplenic ligament. The surgeon inserted his nondominant hand to bluntly dissect the splenic hilum along the pancreatic tail. Care was taken to avoid damaging the pancreatic tail. The main splenic structures were transected with an Endo GIA vascular stapler (US Surgical, Norwalk, CT). The splenodiaphragmatic and splenorenal ligaments were then dissected and divided. The intact spleen was removed through the hand-port incision with minimal extension. A closed drain (Jackson-Pratt, Fortune Medical Instrument Corp., Taipei, Taiwan) was placed via the trocar site.

Discussion

Recurrence of cervical carcinoma is usually recurs in the pelvis in the vaginal stump after radical hysterectomy and in the parametrium after radiotherapy. The most common sites of extrapelvic spread are the lungs, bone and liver [3]. Isolated solitary parenchymal metastasis in the spleen is rare, with only three cases reported in the literature [4].

The best treatment for splenic metastasis is total resection of the spleen. Laparoscopic resection is relatively safe and non-invasive; thus, we selected hand-assisted laparoscopic surgery (HALS) to treat our patient [5]. In comparison to traditional laparoscopic surgery, HALS has several advantages. It improves upon some of the shortcomings of total laparoscopic surgery, such as loss of direct tactile sensation, dependence on eye-hand coordination, instrument changes and the high conversion rate in cases requiring complex intra-abdominal procedures. Thus, HALS is beneficial for some abdominal surgeries involving organ removal, such as splenectomy, nephrectomy, pancreatectomy and esophagectomy. It helps surgeons perform these surgeries in a safer way and, at the same time, preserves the advantages of total laparoscopic surgery [6]. One of the most important advantages of HALS is removal of the target lesion intact instead of piecemeal, as in total laparoscopy. To our knowledge, there is no reported case of trocar site metastasis after HALS. Our patient suffered abdominal wall recurrence; i.e., the tumor was confirmed to be of the same origin as the cervical cancer and metastatic splenic lesion. In addition, the abdominal wall lesion was located at the site where the hand-port was inserted. We believe that this hand-port recurrence resulted from direct implantation of tumor cells.

The causes of tumor seeding into the laparoscopic incision remain unclear. Possible factors or mechanisms include the method of tumor removal, use of contaminated instruments, pneumoperitoneum leakage and aerosolization of tumor cells, known as ‘the chimney effect’. This refers to the high efflux of gas from the abdominal cavity through

the space around the trocars and, upon deflection of the abdomen, through the trocar incision site. This concept remains controversial, given that some investigators have been able to isolate tumor cells escaping from port-sites [7], but others have not been able to show aerosolization of viable tumor cells either in vivo or in vitro [8]. Generally, the site of metastasis is site of the port used to insert laparoscopic instruments for obtaining biopsy specimens or manipulating and extracting the tumor, called the tissue-manipulating port [9]. Recently, we reported a case of uterine leiomyosarcoma metastasizing to the port-site after laparoscopic-assisted vaginal hysterectomy. We had delivered the surgical specimen through the vagina without using an electronic tissue morcellator, and the metastasis occurred at an accessory port, not the tissue-manipulating port [10]. Thus, like wound metastasis, port-site metastasis can occur anywhere. When an electronic tissue morcellator with a spinning blade is used during laparoscopic removal of a resected organ, many small pieces can fall into or spread throughout the abdomen. In the present case, we followed the HALS procedure, so we did not use a tissue morcellator, which is commonly used in patients with an enlarged spleen. After the spleen was circumferentially mobilized, it was delivered through the hand-port. Spillage of cells might have occurred as we extracted the specimen through the hand-port.

Various methods of preventing port-site metastasis have been proposed. Childers et al. [11] recommended routine irrigation of all abdominal puncture sites. Umpleby et al. [12] suggested use of large volumes of saline for lavage of the peritoneal cavity to remove free exfoliated cancer cells. We have begun to use endobags when there is a possibility of a malignant tumor. We also place a wound retractor when we deliver the specimen vaginally to avoid tumor seeding. After removal of the specimen, we usually wash the peritoneal cavity and port-sites with saline. Because the means by which port-site metastasis occurs remains unclear, we must apply various prevention methods. We must bear in mind the possibility of port-site metastasis after laparoscopy in cases of malignancy.

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Conflict of interest The authors declare that they have no conflicts of interest.

References

1. Nagarsheth NP, Rahaman J, Cohen CJ, Gretz H, Nezhat F (2004) The incidence of port-site metastases in gynecologic cancers. *JSLs* 8:133–139

2. Zivanovic O, Sonoda Y, Diaz JP et al (2008) The rate of port-site metastasis after 2251 laparoscopic procedures in women with underlying malignant disease. *Gynecol Oncol* 111:431–437
3. van Nagell JR Jr, Rayburn W, Donaldson ES et al (1979) Therapeutic implications of patterns of recurrence in cancer of the uterine cervix. *Cancer* 44:2354–2361
4. Goktolga U, Dede M, Deveci G, Yenen MC, Deveci MS, Dilek S (2004) Solitary splenic metastasis of squamous cell carcinoma of the uterine cervix: a case report and review of the literature. *Eur J Gynaecol Oncol* 25:742–744
5. Pugliese R, Sansonna F, Scandroglio I et al (2006) Laparoscopic splenectomy: a retrospective review of 75 cases. *Int Surg* 91:82–86
6. Dai LH, Xu B, Zhu GH (2006) Hand-assisted laparoscopic surgery of abdominal large visceral organs. *World J Gastroenterol* 12:4736–4740
7. Allardyce RA, Morreau P, Bagshaw PF (1997) Operative factors affecting tumor cell distribution following laparoscopic colectomy in a porcine model. *Dis Colon Rectum* 40:939–945
8. Whelan RL, Sellers GJ, Allendorf JD et al (1996) Trocar site recurrence is unlikely to result from aerosolization of tumor cells. *Dis Colon Rectum* 39:S7–S13
9. Ramirez PT, Frumovitz M, Wolf JK, Levenback C (2004) Laparoscopic port-site metastasis in patients with gynecological malignancies. *Int J Gynecol Cancer*: 1070–1077
10. Ota T, Huang KG, Sicam RV, Ueng SH, Lee CL (2012) Unusual trocar site metastasis in an uterine leiomyosarcoma after laparoscopic hysterectomy. *J Min Inv Gynecol* 19:252–254
11. Childers JM, Aqua KA, Surwit EA, Hallum AV, Hatch KD (1994) Abdominal-wall tumor implantation after laparoscopy for malignant conditions. *Obstet Gynecol* 84:765–769
12. Umpleby HC, Fermor B, Symes MO, Williamson RC (1984) Viability of exfoliated colorectal carcinoma cells. *Br J Surg* 71:659–663