Commentary

Hepatic metastases in ovarian cancer

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Ovarian cancer is the most lethal disease among gynecologic malignancies (1); about 1/4 of ovarian cancer patients are in stage IV when diagnosed. For ovarian epithelial cancer patients with stage IV disease, the mean overall survival (OS) is around 20 months, and the 5 year-OS is about 20%. About 1 in 5 patients with advanced-stage ovarian cancer have hepatobiliary involvement.

Complete resection of tumors in cytoreductive surgery (CRS) is the most important prognostic factor for ovarian cancer patients. R0 liver resection (LR) is a part of R0 CRS. As part of CRS, LR has been shown to be safe and to prolong survival. In 1963, Brunschwig described the role of LR for liver metastasis of uterine cancer (2). In 1997, Chi (3) reported a series of metastatic gynecologic malignancies which were subjected to LR, among which 7 cases were diagnosed with ovarian cancer. In the past 2 decades, successful reports after LR of metastatic disease from colorectal tumors has encouraged gynecologists to introduce LR as a part of CRS for ovarian cancer with hepatic involvement. Progression-free survival (PFS) and OS have improved in patients who have undergone LR, regardless of the types of primary tumors.

In patients with ovarian cancer, liver parenchymal metastasis (LPM) and liver parenchymal invasion (LPI) are 2 types of liver involvement. LPI develops from perihepatic or diaphragmatic peritoneal metastases. It is important for gynecologic oncologists to differentiate LPM from LPI; LPM is classified as stage IVB disease and is a kind of hematogenous metastases with shorter survival, whereas LPI is a kind of peritoneal implanted disease which does not adversely affect prognosis. The definition of LPI is still not clear at present. It has been defined as a diaphragmatic or perihepatic peritoneal implant with at least 2 cm of invasion into the liver with an irregular or obliterated lesion-liver interface, which replaces part of the liver parenchyma (4). Patients with LPI should be treated the in the same way as those with LPM. For LPI lesions less than 4 cm in diameter, wedge resections without distinguishing the segmental anatomy are often used for preservation of liver volume. For tumors requiring the resection of one liver segment, nonmajor anatomic resection will minimize blood loss and allow a safe excision. In ovarian cancer, segmentectomy of 5 or 6 segments is more commonly needed. Patients may benefit from this more conservative approach because of the preservation of liver volume. To achieve a safe resection, techniques include the use of portal triad clamping selectively, keeping low intravascular volumes during parenchymal transection, hemostasis, and biliostasis with caution. A hepatobiliary surgeon is recommended for this procedure. Considering the goal of optimal cytoreduction for ovarian cancer, there are still controversies regarding whether a resection margin greater than 1 cm is needed, especially in patients with LPI. In recent years, minimally invasive laparoscopic LR has also benefited patients with liver involvement (5). The most common complication of surgery is pleural effusions, and other rare complications include bleeding, liver abscess, and bile or pancreatic leakage.

Some other treatments have been reported in recent years for patients with comorbidities or disease that cannot achieve R0 resection, such as extensive abdominal metastasis, bilateral liver lobe extensive metastasis, or patients with poor performance status. Conservative treatments include thermal ablation techniques and

transarterial chemoembolization (TACE), computed tomography-guided high dose-rate brachytherapy (CT-HDRBT), and stereotactic body radiation therapy (SBRT). Thermal ablation techniques in liver surgery include thermal radiofrequency (RFA) or microwave (MWA) ablation, and laser-induced thermotherapy (LITT) (6,7).

TACE is a conservative and safe minimally invasive treatment for liver metastasis in ovarian cancer, which is a technique involving infusion of chemotherapy drugs and embolization particles into the local artery. Patients with tumors that are unresectable or unresponsive to chemotherapy are candidates for TACE. It is considered as a choice to control intrahepatic metastases, and it has fewer complications (8). For patients with higher risks of anesthesia or surgery, such as multiple or large metastases, or tumors in the central area of liver parenchyma, RFA can be accomplished in a minimally invasive fashion. By using an electrode, it delivers a special current to the tissue surrounding the tumor leading to necrosis. This treatment is not suggested for tumors greater than 5 cm because the incomplete necrosis will lead to higher recurrence rates.

MWA is another thermal ablation technique. To achieve a large ablation volume, it increases intratumoral temperature by using electromagnetic energy in the microwave spectrum. Similar to RFA, a higher rate of recurrence has been found with patients received MWA, so patients with lesions larger than 3 cm are not good candidates (9). LITT uses thin flexible fibers and a water-cooled applicator to induce therapeutic coagulation via laser light. A bare fiber makes a necrotic sphere and a diffuser fiber produces ablation (10).

In conclusion, if R0 resection can be achieved, LR is the best choice for ovarian cancer patients with liver involvement. Other conservative treatments, such as thermal ablation techniques, TACE, and CT-HDRBT, are recommended for patients who are not eligible for surgery.

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