Oligometastases of Gastrointestinal Cancer Origin

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In 1889, Paget proposed a ‘seed-soil’ hypothesis to explain the pathogenesis of metastasis. This hypothesis stated that ‘seeds are carried in all directions; but they can only live and grow in congenial soil’ [1]. Cancer cells have to undergo a multistep process to reach metastatic potential, finally forming metastasis at distant organs, and more information on the pattern and evolution of metastases is needed [2–6]. Later investigators demonstrated that while metastatic cells may reach a number of organs, metastases developed in a select few and for some there are only oligometastases [2, 7].

A variety of techniques is employed for the control of oligometastatic disease. Surgery is the most important treatment modality for oligometastasis. New laparoscopic equipment enables the surgeon now to perform metastasectomy by minimally invasive techniques, which is much more attractive for patients [8]. This is clear in colon cancer but not so evident in other gastrointestinal cancers. Selected patients with synchronous and metachronous oligometastatic disease may potentially benefit from a surgical resection with an acceptable morbidity [8–11]. Resection of peritoneal metastases and intraperitoneal treatment have been carried out successfully [12, 13]. Current evidence suggests that percutaneous ablation also improves oncologic outcomes in some patients in combination with chemotherapy [14, 15].

Despite the traditional radioresistance associated with solid tumors, modern dose-escalated stereotactic body radiation therapy

(SBRT) regimens are able to overcome this and achieve high rates of local control [16–19]. Additionally, exciting work is underway to investigate the immunomodulatory effects of SBRT in conjunction with immunotherapeutics in patients with oligometastatic disease [20].

The development of new drugs and interventional devices has provided platforms to design new treatment algorithms for patients with oligometastasis. Whereas decades ago metastatic disease meant palliative care, new technical treatments may lead to long-time survival in selected patients. Advances in systemic therapy also extended the survival of patients with metastatic disease [21], rendering effective local therapy of increasing importance.

Locoregional chemotherapy such as hepatic arterial infusion (HAI) plays a role in treating hepatic metastases from colorectal cancer in both the resectable and unresectable setting [22–26]. For patients with unresectable metastases to the liver, HAI can be used with systemic chemotherapy to achieve increased response rates even in patients after progression on first- and second-line chemotherapy [27]. Results show increased response and conversion to resection with the use of HAI and systemic therapy versus systemic therapy alone.

The future is certainly better for patients with cancer, even with metastatic disease, and especially for patients with oligometastatic disease.

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