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EDITORIAL – COLORECTAL CANCER

# Factors to Consider in Surgical Resection of Pulmonary Metastatic Carcinoma

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The unique anatomic structure of pulmonary tissue enables almost all human-named malignancies to metastasize to the lung. For example, lung is a common organ for metastasis of colorectal cancer.[1]

Clinical practice has proved that under the premise of effective systemic treatment, surgical resection of pulmonary metastasis from colorectal cancer can prolong survival.[2] However, because it is difficult to objectively conduct large-sample, randomized controlled studies for metastatic patients treated with or without surgery, surgical treatment for "pulmonary metastatic cancer" has been questioned.

Matsuguma et al.[3] provided support for surgery as a treatment for pulmonary metastatic cancer. The authors observed favorable 7-year overall survival for patients who underwent surgery after initial metastasectomy. In addition, the 7-year time to incurable recurrence (TTIR) was 9.7% greater than the 7-year progression-free survival, indicating that repeat definitive local therapy could bring a curative effect for pulmonary metastasis of colorectal cancer. The authors also concluded that TTIR may reflect probability of cure at initial metastasectomy, and that TTIR can be used to analyze prognostic factors associated with cure.

In fact, the factors that affect the prognosis of metastatic tumors and help determine whether surgery should be adopted include the site of the primary tumor, the organ at which the metastasis occurs, the burden of metastasis, the interval between the cure of the primary tumor and the onset of metastatic cancer, the response to systemic treatment, the local control of the primary tumor, and the general health of the patient. Only by comprehensive consideration can we accurately evaluate the prognosis of specific patients and take corresponding measures conducive to survival.

## THE PARTICULAR ORIGIN OF PRIMARY TUMOR IS THE MOST IMPORTANT FACTOR THAT DETERMINES PROGNOSIS AND TREATMENT OF METASTASIS

Although no directly comparable epidemiologic or relevant research data are available, we can compare the number of new cases with the number of deaths of different tumors to derive indirectly the relative malignancy of tumors. On the basis of this comparison, clinicians can rank malignancy by calculation, which shows that thyroid cancer has the mildest malignancy, followed by breast cancer, renal clear cell cancer, colorectal cancer, gastroesophageal cancer, lung cancer, liver/gallbladder/pancreatic cancer, and sarcoma of bone and soft tissue.[4]

Generally, aggressive treatment such as surgery should be performed for metastatic cancers from primary tumors with relatively mild malignant behavior or tumors that have effective treatments. For metastatic cancers from primary cancers with high malignancy and limited therapeutic effects, relatively conservative nonsurgical treatment strategies should be adopted. Colorectal cancer has relatively mild malignancy and good clinical treatment efficacy. Therefore, theoretically, aggressive treatment strategies, including surgery, should be adopted for metastatic colorectal cancer.



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## THE LOCATION(S) OF METASTATIC CANCER IS THE SECOND FACTOR THAT DETERMINES PROGNOSIS AND CHOICE OF TREATMENT

Regardless of synchronous or metachronous metastasis, some tumors remain stable for a long time after the first metastasis, without further or more extensive metastasis or rapid growth. This state is the so-called "oligometastatic status" that is common in clinical practice. Sometimes the disease may be characterized by multiple metastatic sites that occur simultaneously with the primary tumor and/or are accompanied by rapid growth.

The metastasis of colorectal cancer is mostly to clearly preferred sites, and even if liver or lung metastasis (preferred sites for colon cancer) occurs, most will be clinically stable for a relatively long time. In theory, the fact that metastatic cancer occurs at the preferred site and remains stable for a long time also is the rationale for adopting aggressive treatment strategies including surgery.

## THE METASTATIC TUMOR BURDEN IS THE THIRD FACTOR THAT DETERMINES PROGNOSIS AND CHOICE OF TREATMENT

Different scenarios regarding metastatic burden can arise in clinical practice: single metastasis in a single organ, namely, solitary metastasis or several metastases in a single preferred organ, namely, "oligometastasis." To assess the prognosis of metastatic cancer and whether to adopt more aggressive treatment, at least three factors should be considered from the perspective of oncology: the site of the primary tumor, the location of the metastasis (whether it is a preferred site), and metastatic tumor burden. These three factors also are the basis for judging whether the patient is in the "oligometastatic state," which is a special state of metastatic cancer (stage 4). In clinical practice, we can even see the "oligometastasis" state that has been stable for a long time, which provides opportunities for aggressive and possible curative treatment. According to the relative situation of these three factors, some investigators have made a good summary of the prognosis of common tumors after metastasis, and have vividly described the clinical significance of "oligometastasis" status, from which we can know that lung and liver oligometastasis from colorectal cancer may have a favorable prognosis.

## OTHER FACTORS THAT AFFECT PROGNOSIS AND CHOICE OF TREATMENT

With progress in systemic therapy, a small number of selected patients can be offered local therapy, including surgery, at an appropriate time. In the case of gastrointestinal perforation/potential perforation, bleeding/potential bleeding, or obstruction/potential obstruction of intestinal cancer patients, surgery should be performed at any time to save lives, sometimes even before systemic treatment. Moreover, the response to systemic treatment, the interval between primary cancer and metastatic cancer, and supportive care are other factors that must be considered.

The better the effect of systemic treatment, the longer the interval between primary cancer and metastatic cancer, and the better the patient's general condition with supportive care, the better the effect of surgery will be. Giving these various considerations, the study of Matsugama et al.[3] describes "time to incurable recurrence" as an outcome measure that can supplement current metrics regarding patient survivorship in the treatment of metastatic cancer.

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