Radiofrequency ablation is one of safe and effective local control alternative for colorectal pulmonary metastases

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Thank you for inviting me to write this editorial letter for the article "Percutaneous Management of Pulmonary Metastases arising from Colorectal Cancer: a Systematic Review" published by Lyons *et al.* in the journal of *European Journal of Surgical Oncology* (1). This article searched the previously published literatures on the treatment of colorectal pulmonary metastases (CRPM) with radiofrequency ablation (RFA). Medline (since 1952), EMBASE (since 1980), the Cochrane library (since 1995), CINAHL (since 1982) and Google Scholar were adopted, which included a total of eight publications that satisfy the final criteria. The authors concluded that RFA is a safe and effective technique for the management of CRPM.

The conclusion itself of the article is objective and appropriate with no exaggeration of the effectiveness and benefits of RFA for CRPM. Meanwhile, the article also offers the RFA related mortality and morbidity for clinical reference. I have some points on this modality for pulmonary metastasis.

Firstly, metastasis diseases are a great number of different clinical situations. Metastasis tumors were previously thought to be late staged and incurable, for which the application of local treatments, such as surgery, radiotherapy and RFA were inappropriate. However, large amount of data has evidenced that different metastatic tumors have totally different prognoses due to their differences in metastatic situations, tumor burdens and metastatic sites (2). This is the background for the conception of "oligometastases". The commonest metastatic sites of colorectal cancer are liver and lung in sequence. The fact that radical operation could cure some patients has earned a role for local modalities including surgery in the treatment of liver/lung metastases (3). The influencing factors for the outcome of treatment include: the status of the primary tumor, disease free survival (DFS), the possibility of the metastatic sites to be radically eradicated and the tolerance of pulmonary function, etc. Therefore, some metastatic cancer patients could be cured by radical treatment.

Secondly, the advances of thoracic surgery should be concerned when we talk about other local modalities. Pneumonectomy has been successfully applied to the treatment of lung cancer ever since 1933, thereafter the comprehension of anatomy, physiology and pathology of lung has gradually strengthened. The excision extension of pulmonary resection has gone through anatomical pneumonectomy, lobectomy, segmentectomy, sub-segmentectomy and local resection, etc. Technically, this procedure has also undergone several periods from thoracotomy, through muscle sparing, and to the current VATS and robotic surgery, making pulmonary resection more precise and safer with minimal invasion which could be repeated for several times.

The current understanding is that local resection is enough for the treatment of metastatic tumors. However, just as the authors indicated, traditional surgical techniques would inevitably result in a reduction in lung volume. This is mainly attributed to the structure of lung tissue which is rich in blood vessels. All local resection need suturing, and the procedure of suturing is exactly the procedure of lung volume reduction. We must point out that the resection of metastatic tumors with laser predominating tumor precision resection, could obtain the effect of tumor excision without lung volume reduction. Due to the fact that none of the

current treatment modalities could replace the curative effect of surgery, therefore, an effort in comprehension of the thoracic surgery advances should be made before criticizing the lung volume reduction of surgery when talking about other local treatment modalities (4).

Thirdly, the treatment decision for any metastatic tumors should be made by multidisciplinary team (MDT). Although radical surgery for colorectal cancer liver/lung metastases could obtain curative effect and the heterogeneous "oligometastases" situations do exist, metastatic malignancies, still, are undisputed systematic disease. Therefore, to maximize the therapeutic effectiveness and the patients' benefit, the treatment strategies for metastatic diseases should be made under the frame of MDT. This involves a couple of issues including the status of primary tumor, appropriate and sufficient systemic treatment, local pulmonary function, and the techniques and procedures of the surgery (5).

In summary, the treatment of CRPM should firstly be based on the frame of MDT, and individualized therapy, including both systemic and local intervention, should be made. Secondly, the local intervention measures (sometimes a combination of multiple modalities is needed), the skills and techniques mastered by the MDT and locations of the tumors should be comprehensively considered in order to maximize the benefit of the patients. Lastly, to adopt the conclusion of the article: safe and effective as the RFA might be, in the absence of large randomized controlled trials, it is unclear where RFA should sit in the treatment algorithm for patients with CRPM.

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Footnote

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