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Monitoring Non-Operative Treatment for Advanced Esophageal Cancer by Dynamic Ctcs Count: A Case Report

Yan M[1], Wang L[2]*, Song Y[2] and Zhang K[2]

[1]Department of General Surgery, Ningbo Zhenhai District People's Hospital, Affiliated Hospital of Ningbo University, Ningbo, Zhejiang, P.R. China
[2]Department of General Surgery, Ningbo M and J Medical Technologies Co. Ltd., Ningbo, Zhejiang, P.R. China

Abstract

Circulating tumor cells (CTCs) are closely related to the prognosis of patients with malignant tumors, meaning they have important value in the evaluation of treatment efficacy and prognosis of cancer patients. During a non-operative treatment for a patient with advanced esophageal cancer, we performed dynamic monitoring of circulating tumor cell counts to evaluate the efficacy. Compared with the clinical stage (cTNM) prognostic evaluation system, dynamic monitoring of CTCs showed great value in therapeutic effect evaluation and prognostic evaluation in non-operative treatment of patients with advanced esophageal cancer.

Keywords: Esophageal cancer; Non-operative treatment; Circulating tumor cells; Prognosis

Introduction

Esophageal cancer is one of the most common malignant tumors in the world. China's esophageal cancer patients account for about 60% of the world's total, and most of them are in the advanced stage when diagnosed [1]. They lost their chance of surgery and could only be treated by non-operative treatment. Determining methods to evaluate the efficacy of non-operative treatment for patients with advanced esophageal cancer is particularly important. Although the guidelines of NCCN (National Comprehensive Cancer Network) for esophageal carcinoma were proposed in 2017, preoperative clinical (c) stages have been proposed in addition to pathological (p) stages to evaluate the prognosis of non-operative esophageal cancer patients [2]. However, preoperative clinical (c) stages and postoperative pathological (p) staging results are often failed to show consistency [3]. Therefore, the clinical prediction of the prognosis of non-operative esophageal cancer patients using the cTNM staging methods in the NCCN guidelines does not meet the clinical need. The development of a new assessment method to make up for the current deficiencies is particularly important. In this case, clinicians used the dynamic CTCs tests (the separation and enrichment process of CTCs is based on the immunomagnetic bead method combined with density gradient centrifugation on the Cell Rich™ CTCs detection platform of Ningbo M and J Medical Technologies Co, Ltd.) to evaluate the prognosis of patients with non-operative advanced esophageal cancer patients, showing good clinical results.

Case Report

An elderly Chinese male was referred to hospital with the chief complaint of right neck mass was found for 3 days on 2016.4.26. Cervical CT on 2016.4.29 shows: Space occupying appear in the right rear of the trachea. Liver B-enhanced: 38 × 35 × 26 mm boundary clearance hypoechoic mass on the right anterior lobe of the liver, metastatic cancer. Systemic B-ultrasound detection suggests multiple metastatic lymph nodes on the left clavicle, the neck and the retroperitoneal. B-ultrasound positioning needle biopsy at the right neck lesions on 2016.5.31: poorly differentiated squamous cell carcinoma. Gastroscope on 2016.5.9 shows: Esophageal cancer, pathological examination reports poorly differentiated squamous cell carcinoma (Figures 1A-1D). The first time cTNM evaluation is $cT_4N_2M_1$. Treatment: The patient was advanced in clinical stage: there was no indication for surgery, clinician gave palliative chemotherapy 2 course: TP regimen (Paclitaxel+Cisplatin). Cervical CT review after chemotherapy on 2016.6.20: Space occupying appear in the right rear of the trachea (Figures 2A and 2B).

The first time CTC detection on 2016.8.30: 4 CTCs were detected. Liver B-enhanced: 38 × 35 × 26 mm boundary clearance hypoechoic mass is on the right anterior lobe of the liver. Systemic B-ultrasound review: multiple metastatic lymph nodes on the left clavicle, the neck and the retroperitoneal.

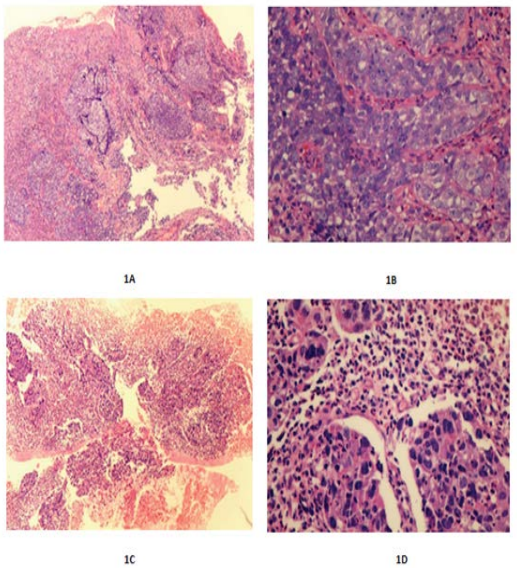

Figure 1: Pathological examination of esophageal carcinoma and needle biopsy of the right neck lesions: 1A: HE is staining of esophageal carcinoma (10x), 1B: HE is staining of esophageal carcinoma (40x), 1C: HE is staining of needle biopsy (10x), 1D: HE is staining of needle biopsy (40x).

***Corresponding author:** Wang L, Department of General Surgery, Ningbo M and J Medical Technologies Co. Ltd., Ningbo, Zhejiang, P.R. China, Tel: + 8615606685100; E-mail: wanglimygene@163.com

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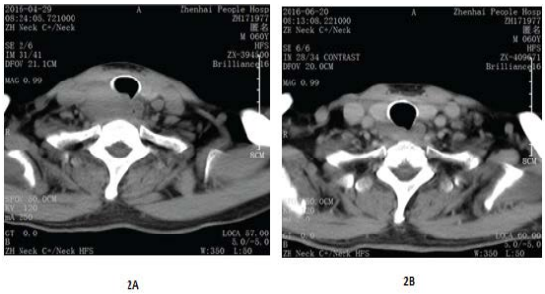

2A 2B

Figure 2: Neck CT before and after chemotherapy: 2A: Neck CT before chemotherapy (2018.4.29), 2B: Neck CT after chemotherapy (2018.6.20).

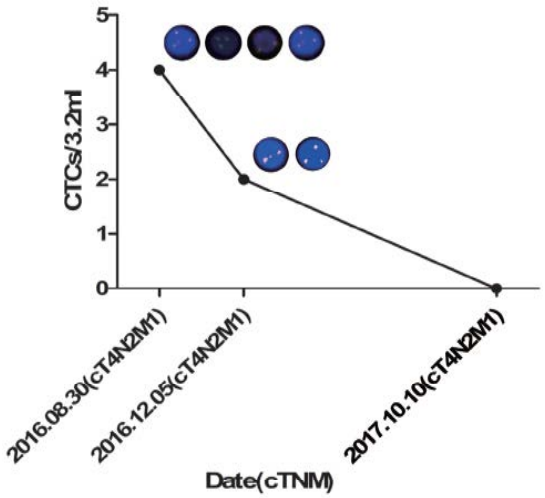

Figure 3: The CTCs count trend and clinical stage (cTNM) diagram.

The second time cTNM evaluation is $cT_4N_2M_1$. Treatment: In order to treat hepatic metastases, clinician did liver radiofrequency ablation treatment for the patient. The second time CTC detection on 2016.12.30: 2 CTCs was detected. Liver B-enhanced: 36 × 31 × 20 mm boundary clearance hypoechoic mass on the right anterior lobe of the liver. Systemic B-ultrasound review: multiple metastatic lymph nodes on the left clavicle, the neck and the retroperitoneal.

The third time cTNM evaluation is $cT_4N_2M_1$. Treatment: The patient refused any of anti-tumor therapy. The third time CTC detection on 2017.10.10:0 CTCs was detected. Liver B-enhanced: 32 × 27 × 19 mm boundary clearance hypoechoic mass on the right anterior lobe of the liver. Systemic B-ultrasound review: multiple metastatic lymph nodes on the left clavicle, the neck and the retroperitoneal.

The fourth time cTNM evaluation still is $cT_4N_2M_1$. Treatment: The patient refused any of anti-tumor therapy. Finally, according to the follow-up results, the patient survived for 2 years 3 months.

Discussion

CTCs are tumor cells that enter the blood circulation from the primary tumor or metastases of the tumor. Nowadays, studies have shown that it has very important value in the diagnosis, treatment, and prognosis evaluation of malignant tumors [4]. There are many reports suggesting that CTCs are correlated with prognosis of patients with esophageal cancer, which seems to have been validated in this study [5,6]. However, whether the number of CTCs is related to the TNM staging of esophageal cancer is still debatable [7,8]. In this case, the CTCs count of patients under dynamic monitoring showed a significant downward trend during non-operative treatment, but the corresponding clinical stage (cTNM) showed no downward trend at all (Figure 3). It was demonstrated by follow-up that this patient's overall survival is 2 years 3 months, significantly longer than expected. In this case, CTCs count dynamic testing appears to show better prognostic value than cTNM staging. The reason may be that CTCs reflect the patient's therapeutic efficacy sooner than imaging [9]. Therefore, the number of CTCs may change before the patient's imaging-based cTNM changes. Moreover, the prognosis of cancer patients is closely related to tumor burden, and the tumor burden includes many factors such as tumor volume and tumor cell activity. Therefore, the evaluation of the therapeutic effect by cTNM may not fully reflect the change of tumor burden. CTCs has been reported to be closely related to tumor burden, which may better suggest the prognosis of patients with malignant tumors [10].

Conclusion

Nowadays, we need more accurate means to evaluate the prognosis of cancer patients for precision medicine. Especially in the case of non-operative cancer patients, the evaluation effect of cTNM staging is not ideal. Therefore, using CTCs count tests to evaluate the prognosis of non-operative cancer patients may have significant value.

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