Case Report

The Case study of brain metastases after neoadjuvant chemotherapy and radiotherapy for adenocarcinoma.

Abstract

Background: Treatment given as a first step to shrink a tumor before the main treatment, which is usually surgery, is given. Examples of neoadjuvant therapy include chemotherapy, radiation therapy, and hormone therapy. It is a type of induction therapy. The most common pattern of esophageal cancer metastases (ECM) is to the lymph nodes, lung, liver, bones, adrenal glands, and brain.

Case Presentation

A male patient, 47 years old, was admitted to the hospital on July 31, 2020, mainly due to "progressive dysphagia. Two months ago, the patient had difficulty eating without obvious incentives, especially when eating hard food such as rice. The liquid diet was acceptable, accompanied by retrosternal pain and discomfort, heartburn, and obvious weight loss. The symptoms gradually aggravated without obvious relief with previous bodybuilding.

Conclusion

In summary, there are few international investigations and an absence of relevant information and literature on the environment in which tumor cells survive after radiotherapy. Clinicians can't ignore the issue of whether radiotherapy will alter the tumor cells' natural environment, leading to tumor cell escape and an increase in brain metastases.

Key words: neoadjuvant chemotherapy; esophagogastric junction carcinoma; dysphagia

Introduction

Brain metastases from breast cancer constitute the second most common cause of brain metastasis and the incidence of these frequently lethal lesions is currently increasing, following better systemic treatment. The main hypothesis is that cancer cells from breast parenchyma must undergo epithelial-to-mesenchymal transition to enter the bloodstream, survive haematological diffusion and implant into the CNS after extravasation and a further step of reverse mesenchymal-to-epithelial transition [13]. Thus, cancer cells metastasising to the brain must possess a distinct set of adaptations to develop effectively in this unique environment with the acquisition of several fundamental characteristics to cross the blood–brain barrier, proliferate perivascularly and begin neoangiogenesis until the creation of a brain tumour barrier [14].

Case presentation

A male patient, 47 years old, was admitted to the hospital on July 31, 2020, mainly due to "progressive dysphagia. Two months ago, the patient had difficulty eating without obvious incentives, especially when eating hard food such as rice. The liquid diet was acceptable, accompanied by retrosternal pain and discomfort, heartburn, and obvious weight loss. The symptoms gradually aggravated without obvious relief. Previous bodybuilding. Physical examination: normal development, poor nutrition, thin constitution, no palpable supraclavicular lymph node enlargement, symmetrical thorax without deformity, symmetrical respiratory movement on both sides, flat and soft abdomen, no tenderness, and no palpable mass. Auxiliary examination: (time) Electronic gastroscopy prompts: a deep and large ulcer can be seen in the cardia-stomach fundus, with a central depression, low white coating, brittle texture, and bleeding on touch. The tumour extends

from the cardia to the gastric fundus, and the gastric body mucosa can be seen stiff. Pathological biopsy tips: (Time) EUS: esophagogastric junction carcinoma, T4N1Mx. (Time) Enhanced abdominal CT: Cardia—local thickening of the stomach wall at the fundus of the stomach, with edema. Pathology: Cardia-fundus poorly differentiated adenocarcinoma after consultation and discussion, concurrent radiotherapy with paclitaxel and Carboplatin was given (paclitaxel: 80 mg/m2, IVGTT d1; Carboplatin: 1.5 IVGTT d1; repeated weekly, 1 cycle every 3 weeks). The process and dose of supplementary radiotherapy were reexamined after three cycles, of timed electronic gastroscopy: the cardia opened and closed well, the dentate line was clear, and the distance from the incisors was 40cm, the tumour lesion volume was significantly reduced, and local mucosal disorders were seen at the cardia-fundus. Endoscopic ultrasonography: cardia and fundus lesion: T3N1Mx. Enhanced CT of the abdomen: cardia-gastric fundus, local gastric wall thickening with edema. The patient refused surgical treatment and requested to continue Paclitaxel + Carboplatin single-week chemotherapy. On April 29, 2021, the patient suddenly suffered from disturbance of consciousness and convulsions of the limbs at home. Brain magnetic resonance imaging was performed after emergency admission: local meningeal thickening and nodules in the right temporoparietal lobe could not be ruled out, nor could malignant edema, metastatic tumour with meningeal metastasis, or lymphoma. Diagnosis of brain space-occupying lesions. The family members refused further treatment, and the patient died on October 10, 2021, during later follow-up.

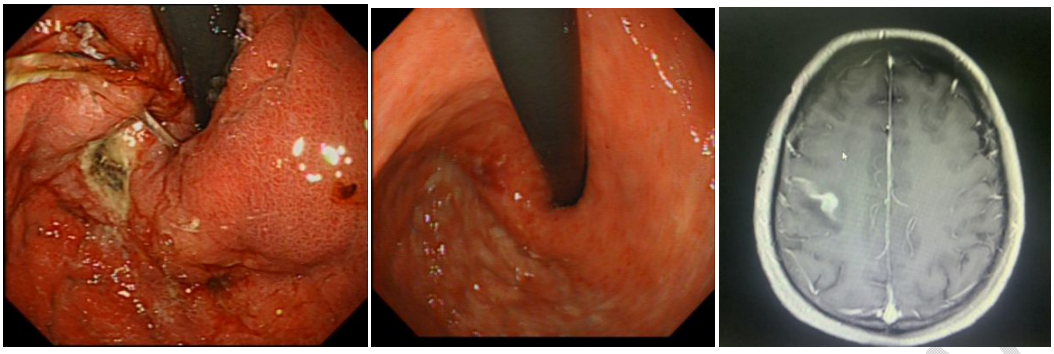

Figure 1 (Gastroscopy of the patient before chemotherapy)

Figure 2 (Endoscopy of the patient after radiotherapy and chemotherapy)

Figure 3 (MRI of the patient's brain)

Discussion

Esophagogastric junction adenocarcinoma is now recognized as a special and independent malignancy. In Asia, AEG is dominated by Siewert types II and III and only 1–6% by type I. In recent years, the incidence of AEG in my country has gradually increased, and its proportion in all gastric adenocarcinoma has increased from 22.3% in the early 1990s to 35.7% in the 2010s. And continued to increase. The diagnosis of AEG in my country has often reached the middle and late stages, and it is difficult to achieve R0 resection by direct radical surgery, and the prognosis of patients is poor. Therefore, in the past ten years, people have begun to evaluate the effect of comprehensive treatment modes such as

neoadjuvant chemotherapy and neoadjuvant Chemoradiotherapy. However, a study showed an increased incidence of brain metastases in patients with esophageal cancer who received neoadjuvant Chemoradiotherapy, which the investigators believe cannot be explained solely by prolonging survival [1].

Cancer patients often have metastases in their brains. In fact, intracranial metastases are more common than primary brain tumours [2]. Clinically, approximately 10% of cancer patients develop brain metastases during advanced disease development [3]. The vast majority of brain metastases occur in only three types of cancer: melanoma, lung cancer, and breast cancer [4]. The incidence of brain metastases in gastric cancer is 1%, and the frequency of brain metastases in esophageal cancer is 1.4%–3.9%. At the same time, two large-scale international studies included 1588 and 1612 patients with esophageal cancer, but only 1.7% and 1.6% had brain metastases, and the study suggested that the incidence of brain metastases in squamous cell carcinoma may be higher than that in adenocarcinoma [5]. Most patients with brain metastases from esophageal cancer are male, consistent with the increased incidence of this cancer in male patients [6]. Overall, the prognosis for these patients is very poor, with a median survival of only a few months. As the cause of most cancer-related deaths, the treatment of metastatic disease is still the main challenge of cancer treatment [7], so further understanding the incentives of tumour metastasis is an issue that we have to pay attention to.

The brain metastases are often symptomatic at an early stage, leading to nausea, headaches, and/or neurologic deficits that require prompt and aggressive treatment. Targeted therapy for brain metastases can be used to relieve these

symptoms, but also to reduce mortality and/or achieve cure in some cases. These treatment options include neurosurgery, whole brain radiation therapy (WBRT), stereotactic radiosurgery, and chemotherapy [8]. Overall, patients diagnosed with brain metastases have a poor prognosis, with a median survival in the range of several months [6, 9]. A large study analysed the outcomes of 1292 patients diagnosed with brain metastases and found a median survival of only 3.4 months [9]. However, since the 1990s, accumulating evidence has shown that surgical resection of brain metastases significantly reduces morbidity and prolongs survival compared with nonsurgical approaches. Importantly, age and patient performance status, as well as the number of brain metastases, the occurrence of extracranial metastases, and the primary tumour site, were found to be important prognostic factors in patients with brain metastases [10–12].

Conclusion

In summary, there are few international investigations and an absence of relevant information and literature on the environment in which tumor cells survive after radiotherapy. Clinicians can't ignore the issue of whether radiotherapy will alter the tumor cells' natural environment, leading to tumor cell escape and an increase in brain metastases. Clinically, it is important to finish auxiliary brain examinations on time and to begin utilizing effective intervention techniques as soon as possible.

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