

# Esophageal Stenosis in a Patient with Breast Cancer after Chemotherapy: A Case Report and Review of Literature

**Zhenfei Ou**

The Affiliated Hospital of Qingdao University

**Linlin Ren**

The Affiliated Hospital of Qingdao University

**Xiaoyan Yin**

The Affiliated Hospital of Qingdao University

**Cuiping Zhang**

The Affiliated Hospital of Qingdao University

**Congcong Min** (✉ [mincong2008@163.com](mailto:mincong2008@163.com))

The Affiliated Hospital of Qingdao University <https://orcid.org/0000-0002-4752-7649>

---

## Case report

**Keywords:** Breast Cancer, Chemotherapy, Esophageal stenosis, Case report

**Posted Date:** November 15th, 2021

**DOI:** <https://doi.org/10.21203/rs.3.rs-1029492/v1>

**License:** © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

# Abstract

**Introduction:** Esophageal stenosis after chemotherapy in breast cancer patients is rare. It is important to distinguish esophageal stenosis from esophageal metastasis caused by breast cancer.

**Case presentation:** We present the case of a 62-year-old woman who was diagnosed with breast cancer 4 months prior, had dysphagia and was referred to our department for further treatment after 2 cycles of chemotherapy. She suffered from severe mouth ulcers, painful swallowing and large areas of skin pigmentation with overlying scaliness after every chemotherapy session. Endoscopy revealed that the lumen of the lower esophagus was obviously narrow with ulceration above the stenosis. Histological results demonstrated inflammatory fibrinous necrosis and granulation tissue, with no clear neoplastic component.

**Conclusion:** Short-term esophageal stenosis after chemotherapy may be caused by local mucosal injury, but malignant tumors need to be excluded.

## Background

Patients with advanced tumors often undergo neoadjuvant chemotherapy to shrink tumors and kill invisible metastatic cells early to facilitate subsequent treatment, such as surgery and radiotherapy. Paclitaxel, cyclophosphamide, and doxorubicin hydrochloride liposome injection are all intravenous chemotherapy drugs commonly used in patients with breast cancer. These drugs have been reported to cause changes in the skin and mucosa, but effects on the esophageal mucosa have rarely been reported<sup>[1]</sup>. We herein report an uncommon case of chemotherapy-induced esophageal stricture, which maybe misdiagnosed or overlooked.

## Case Presentation

A 62-year-old female patient presented with dysphagia and retrosternal pain for 2 months. The patient was diagnosed with right breast cancer (T2N1M0) 4 months ago. She did not undergo surgery or any radiation treatment because of metastatic breast cancer in the right axillary lymph node. Therefore, she received TEC chemotherapy including albumin paclitaxel, doxorubicin hydrochloride liposome injection and cyclophosphamide for 4 cycles. She developed severe mouth ulcers, painful swallowing and large areas of skin pigmentation with overlying scaliness after every chemotherapy session (Figure 1). Over time, she experienced progressively worsened dysphagia and started vomiting after eating. Ultimately, she could swallow only liquid food.

**Figure 1 Skin changes** Large areas of black pigmentation on the whole body with overlying scaliness, accompanied by chapped skin.

Physical examination revealed she had malnutrition and hair loss after chemotherapy. Surprisingly, her skin throughout her body showed large areas of skin pigmentation with overlying scaliness and skin

cracks. The laboratory results showed that she had mild hypoproteinemia and hypokalemia. And her carcinoembryonic antigen level was 6.02 ng/mL. Upper gastrointestinal radiography showed significant stenosis of the middle and lower third of the esophagus with a filling defect and stiffening of the canal wall, which indicated esophageal cancer (Figure 2A). A computed tomography (CT) scan of the chest showed a narrow esophageal cavity and thickened esophageal wall (Figure 2B). Upper gastrointestinal endoscopy revealed that the lumen of the lower esophagus (35 cm from the incisor) was severely narrow, with ulceration above the stenosis (Figure 3). The histological results revealed inflammatory fibrinous necrosis and granulation tissue with a small amount of resurgent epithelial cells but no obvious tumor cells (Figure 4).

According to the skin damage and oral ulcers after each chemotherapy session, as well as endoscopic manifestations and pathological features, the esophageal stenosis was considered to be caused by esophageal mucosal injury due to chemotherapy drugs.

Considering the greater risk of esophageal perforation and tracheoesophageal fistula caused by esophageal dilatation, a naso-intestinal tube was inserted to start enteral nutrition support. The naso-intestinal tube was unobstructed, and the patient had no nausea or vomiting. The patient's right breast tumor shrank slightly after chemotherapy and was considered to be stable. Later, she underwent modified radical mastectomy for right breast cancer under general anesthesia. She has been followed up for more than 2

months with gradually improving dysphagia.

## Discussion

Breast cancer is now the most common cancer among women in China, with half the number of patients diagnosed with breast cancer in the European Union each year<sup>[2]</sup>. We first suspected esophageal stenosis caused by metastasis from breast cancer, as metastatic lymph nodes had been found in the patient. Esophageal metastasis of primary breast cancer is rare, with nearly all the literature on this topic consisting of case report studies<sup>[3]</sup>. A case was reported in a patient who was successfully cured of breast cancer after chemotherapy and mastectomy and developed esophageal cancer 19 years later<sup>[4]</sup>. Esophageal metastases are rare in breast cancer patients, most of whom are between 50 and 70 years of age, and the disease-free interval is usually 5-10 years, with most metastases occurring in the mid-thoracic esophagus<sup>[5]</sup>. Esophageal metastasis from breast cancer most often involves the middle or lower third of the esophagus<sup>[3]</sup>. Lesions of esophageal metastasis always originate from the outside inwards, and metastasis to the mucosal layers is extremely rare. Therefore, previous studies reported endoscopy findings of an esophagus with a normal mucosa<sup>[3]</sup>. Endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) can improve the positive rate of biopsy. In our case, esophageal stricture occurred in the middle or lower third of the esophagus. However, the patient had obvious esophageal mucosal injury manifesting as ulcers and local luminal stenosis. Histopathological examination showed no malignant tumor cells but chronic ulcerative lesions with granulation tissue and inflammatory exudates. In addition,

worsened dysphagia occurred soon after chemotherapy for breast cancer, which was different from previous reports.

Doxorubicin, cyclophosphamide and paclitaxel are currently the main treatment options in new adjuvant therapy for breast cancer<sup>[5]</sup>. The mechanism of action of Taxol, which is mainly derived from the yew tree *Picea abies*, involves the inhibition of mitosis. The main skin and mucosal reactions include alopecia, mucositis, and erythema, which usually subside after the discontinuation of the drug<sup>[1]</sup>. Kazuo Matsuura et al. reported a case of severe esophageal stricture after radiotherapy for thoracic metastases following bevacizumab (Bev)-paclitaxel (PTX) combination chemotherapy in a patient with recurrent breast cancer<sup>[6]</sup>. Cyclophosphamide is a nitrogen mustard drug that plays an important role in breast cancer and blood disorders<sup>[7]</sup>. Siri Beier Jensen et al. reported erythema (n = 10, 22%) and ulceration (n = 7, 16%) in 45 patients with breast cancer during treatment with cyclophosphamide and epirubicin, respectively<sup>[8]</sup>. Muhammad Sohail Akhtar et al. showed that fluorouracil, doxorubicin and cyclophosphamide (FAC) treatment caused more vomiting and mucositis than paclitaxel and carboplatin (PC) treatment<sup>[9]</sup>. Our patient developed lesions on the skin and mucosa as well as mouth ulcers after each chemotherapy treatment that may have resulted from mucosal changes caused by the chemotherapy drugs. We consider that there may also be an effect of these chemotherapy drugs on the esophageal mucosa and that difficulty eating is usually unnoticeable until this effect becomes more severe. We first placed a nasal feeding tube to improve the patient's nutrition. Later, she underwent modified radical mastectomy for right breast cancer under general anesthesia. At present, her dysphagia gradually improved.

## Conclusions

We report this case of esophageal stenosis after chemotherapy in a patient with breast cancer. The current diagnosis is considered to be esophageal stricture due to chemotherapy drugs. Our case shows that esophageal stricture can occur after chemotherapy for breast cancer. Therefore, physicians should pay close attention to digestive symptoms at the time of chemotherapy and manage these symptoms promptly. The patient needs to be followed up with regular gastroscopy and endoscopic ultrasonography.

## Abbreviations

CT

computed tomography

H & E

hematoxylin and eosin

EUS-FNA

Endoscopic ultrasound-guided fine-needle aspiration

## Declarations

**Ethics approval and consent of participate**

The study was approved by the institutional review board of The Affiliated Hospital of Qingdao University (No.QYFYWZLL26644).

### **Consent for publication**

Written informed consent was obtained from the patients for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

### **Availability of data and materials**

Not applicable

### **Competing interests**

The authors declare that they have no competing interests.

### **Funding**

None.

### **Authors' contributions**

OuZF was involved in drafting the manuscript; RLL and YXY was involved in acquisition of data and preparing the figures; MCC and ZCP designed and revised the manuscript; All authors have read and approved the final manuscript.

### **Acknowledgements**

The authors greatly appreciate the American Journal Experts (AJE) providing us with English editing services.

## **References**

1. Cohen, P. R: **Photodistributed erythema multiforme: paclitaxel-related, photosensitive conditions in patients with cancer.** *Journal of Drugs in Dermatology* 2009, **8**:61–64.
2. Fan L, Strasser-Weippl K, Li J J, St Louis J, Finkelstein, D M, Yu KD, Chen WQ, Shao ZM. **Breast cancer in china.** *LANCET ONCOLOGY* 2014,**15**:279–89.
3. Hui S, Jing W, Hong L, Nan W, Wu L, Quan Z, Miaomiao W, Shuzhen Lv, Yunsheng Yang. **Review of esophageal metastasis from breast cancer.** *Gland Surgery* 2020, **9**:417–422.
4. Mohammad M A, Sebouh S, Madhusudhan R S. **Metastatic Breast Cancer Presenting as Esophageal Stricture.** *Clin Gastroenterol Hepatol* 2017,**15**:A33-A34.

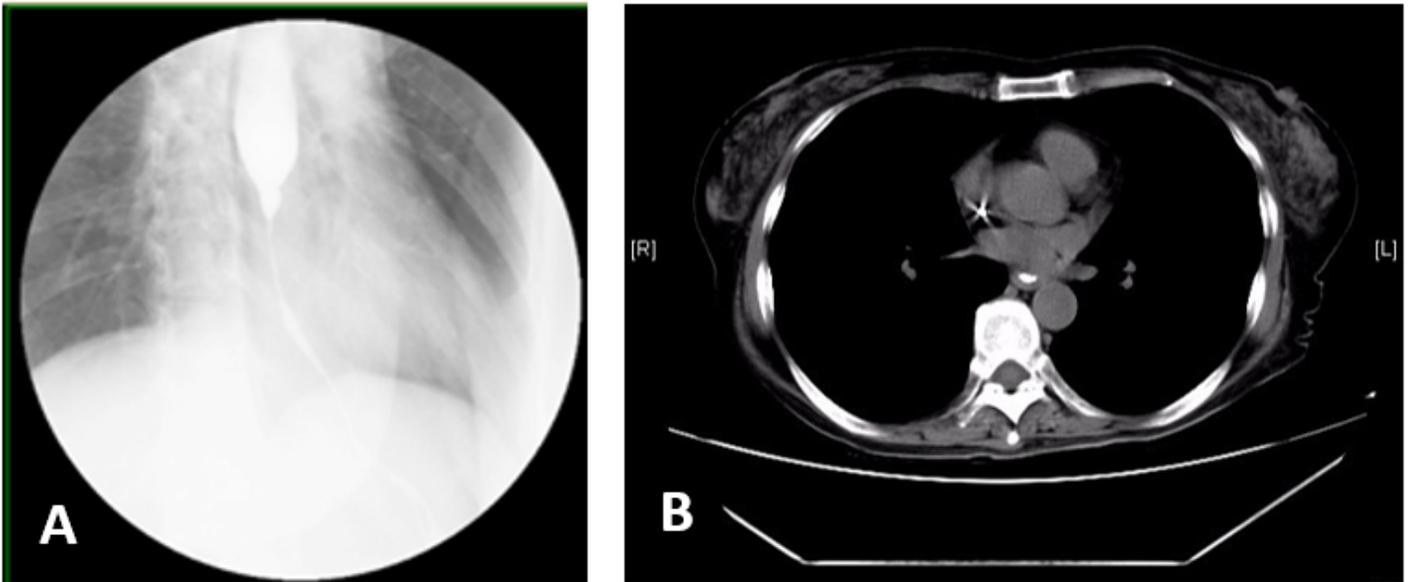
5. Qiaoping X, Li YY, Zhu JJ, Liu J, Li QY, Chen LY, Luo Y, Shi CC, Li YL, Yan W. **Cost-effectiveness of paclitaxel, doxorubicin, cyclophosphamide and trastuzumab versus docetaxel, cisplatin and trastuzumab in new adjuvant therapy of breast cancer in china.** *Cost Eff Resour Alloc* 2021,**19**:11.
6. Kazuo M, Akihiko O, Yuki I, Akihiro F, Asami N, Toshiaki S. Patient with Recurrent Breast Cancer Who Developed Radiation Esophagitis with Severe Esophageal Stenosis after Combined Bevacizumab and Paclitaxel Therapy-A Case Report. *Gan To Kagaku Ryoho.* 2020;**47**(11):1605–1608[PMID: 33268737]
7. Yi-Kun K, Yi-Ran Si, Guang-Yu A, Peng Y. **Efficacy and safety of cyclophosphamide in anthracycline- and taxane-based neoadjuvant chemotherapy in breast cancer: a meta-analysis.** *Gland Surg* 2021,**10**:252–261.
8. Siri BJ, Henning T M, Olav J B, Jesper R, Nils B, Birgitte N. **Oral mucosal lesions, microbial changes, and taste disturbances induced by adjuvant chemotherapy in breast cancer patients.** *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2008,**106**:217–26.
9. Muhammad SA, Farzana K, Misbah M, Shahab F, Kokab. **Evaluation of paclitaxel and carboplatin versus combination chemotherapy with fluorouracil, doxorubicin and cyclophosphamide as a neoadjuvant therapy in patients with inoperable breast cancer.** *J Coll Physicians Surg Pak* 2010,**20**:748–52.

## Figures



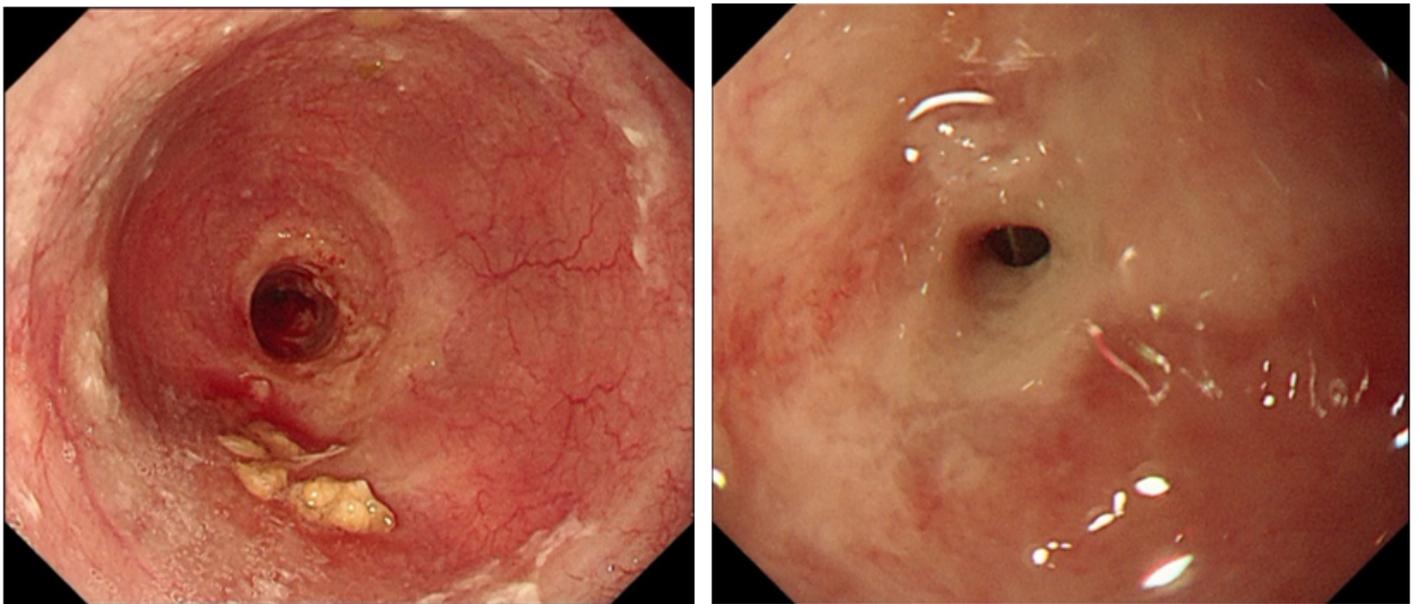
**Figure 1**

Skin changes Large areas of black pigmentation on the whole body with overlying scaliness, accompanied by chapped skin.



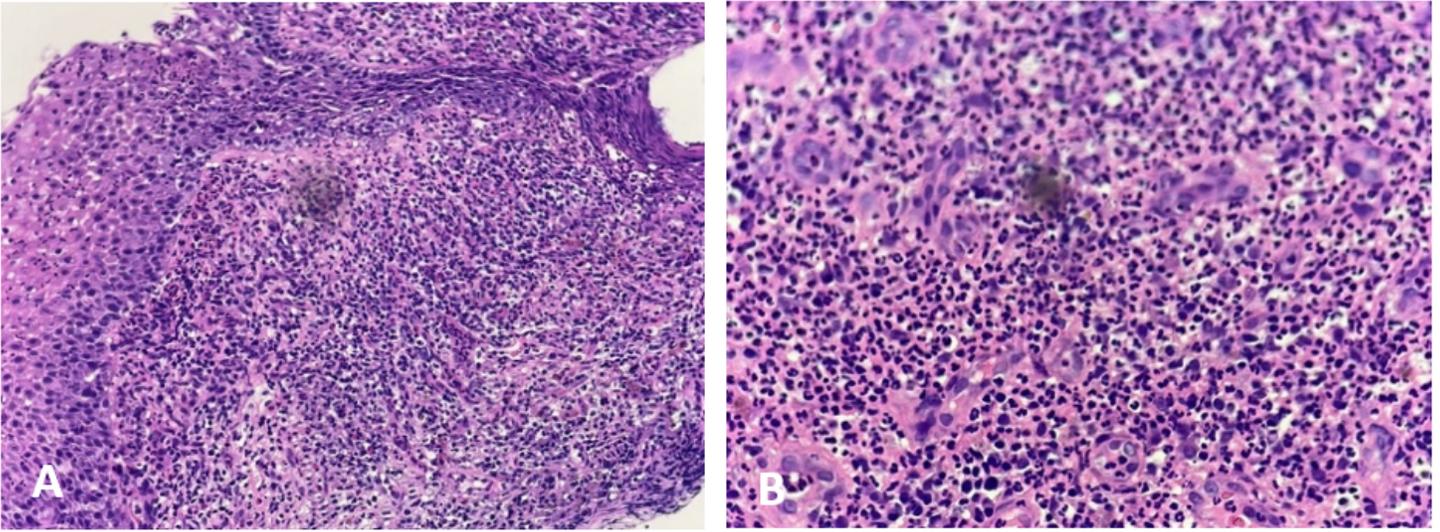
**Figure 2**

Upper gastrointestinal radiography and computed tomography showed esophageal stenosis. (A) A filling defect in the middle and lower esophagus, stiffening of the wall, and narrowing of the lumen. (B) A narrow esophageal cavity and thickened esophageal wall.



**Figure 3**

Upper gastrointestinal endoscopy performances. Esophageal cavity was obviously narrow (35 cm from the incisor), approximately 2 mm in diameter, with local ulcer-like changes and ulceration above the stenosis.



**Figure 4**

Histological features. Inflammatory fibrinous necrosis and granulation tissue with a small amount of resurgent epithelial cells but no obvious tumor cells (A: H&E 200x; B: H&E 400x).