Case report

Metastatic breast cancer presenting as linitis plastica of the stomach

LISA A. WHITTY¹, DAVID L. CRAWFORD¹, JAY H. WOODLAND¹, JITENDRA C. PATEL², BRYCE NATTIER¹,
and CHARLES R. THOMAS, JR.³

¹Department of Surgery, University of Illinois College of Medicine at Peoria, Peoria, IL, USA

²Department of Pathology, University of Illinois College of Medicine at Peoria, Peoria, IL, USA

³Department of Radiation Oncology, UTHSCSA, Mail Code 7889, 7979 Wurzbach Road, San Antonio, Texas, 78229-3900, USA

Abstract

Early detection and treatment of breast cancer, leading to longer survival, has revealed the natural history of this disease process. Linitis plastica of the stomach is a potential long-term sequela of metastatic breast cancer. Here we present a case of metastatic breast cancer presenting as linitis plastica, as well as the treatment algorithm for this rare clinical entity. The world literature describes a clear pattern of linitis plastica for metastatic infiltrating lobular breast cancer and a discrete nodular pattern for infiltrating ductal cancer, in regard to metastasis to the stomach. To our knowledge, this is the first case of infiltrating ductal cancer presenting as linitis plastica of the stomach.

Key words Metastatic breast neoplasm · Linitis plastica

Introduction

Early detection and treatment of breast cancer, leading to longer survival, has revealed the natural history of this disease process. Linitis plastica of the stomach is a potential long-term sequela of metastatic breast cancer. It is essential that the clinician be aware of this pathologic entity when evaluating women, with or without a history of breast cancer, because the treatment for metastatic breast cancer presenting as linitis plastica is dramatically different from that implemented to treat primary gastric cancer presenting as linitis plastica.

Case report

We present a 55-year-old woman who was diagnosed with linitis plastica of the stomach 11 years following

modified radical mastectomy with immediate transverse rectus abdominus myocutaneous flap (TRAM) reconstruction, followed by six cycles of chemotherapy. Pathology from the initial diagnosis was reported as stage II (T2N0M0), grade III infiltrating ductal carcinoma (IDC). Analysis of the tumor revealed it to be estrogen receptor (ER) +, progesterone receptor (PR) + with an S-phase fraction of 6%. There were 15 axillary lymph nodes, all of which were negative for metastatic disease. Of note, the patient has a family history significant for breast cancer (sister) and gastric cancer (mother).

The patient was initially evaluated by the gastroenterologist for obstructive gastrointestinal complaints. She underwent two lower endoscopic examinations, both of which were suggestive of a transverse colonic stricture, which was biopsy-negative on both occasions. The patient did not undergo upper endoscopy pre-operatively. ¹⁸Fluoro-deoxyglucose (FDG) positron emission tomography (PET) scan was negative and a computed tomography (CT) scan was obtained, which was suspicious for a transverse colon mass. The patient underwent a diagnostic laparoscopy, which was converted to a laparotomy after the diagnosis of linitis plastica of the stomach was confirmed intraoperatively by the surgical pathology team. The initial frozen section had characteristics consistent with a second primary cancer. A total gastrectomy, with Roux-en-Y esophagojejunostomy reconstruction and cholecystectomy, along with a subtotal colectomy, were sequentially performed. The latter procedure was indicated due to the presence of three colonic strictures. In addition, a feeding jejunostomy was placed. The patient was discharged home on postoperative day 9 after tolerating a per-oral diet.

Final pathological analysis of the stomach, colon, appendix, and terminal ileum demonstrated diffuse infiltration with a poorly differentiated adenocarcinoma, predominantly in the muscularis propria and serosal

Fig. 1. Stomach with grossly metastatic tumor within the wall

Fig. 2. Colon with luminal narrowing and thickened wall secondary to metastatic tumor invasion

Fig. 3. Cross section of formalin fixed stomach with thickened wall secondary to tumor

fat (Figs. 1–5). Immunoperoxidase stain revealed CK7 (+), CK20 (–), ER (+), PR (–), and E-cadherin (faintly +), features that favor a breast primary (Figs. 6, 7).

Discussion

This case is of interest for three reasons. First, the management of metastatic linitis plastica secondary to breast cancer differs from that of a primary gastric carcinoma. Second, the clinician must be astute and aggressive when evaluating a female patient when there is a history of breast cancer. These patients may present with gastrointestinal complaints or surgical findings that are consistent with linitis plastica, a rare yet known sequela of breast cancer. Third, the primary breast cancer was of the infiltrating ductal subtype, which, historically, has been correlated with a nodular pattern when associated with metastasis to the stomach. This is the first report, to our knowledge, of infiltrating ductal breast cancer presenting as linitis plastica of the stomach.

Breast cancer is the most common malignancy in women. It normally metastasizes to the liver, lung, brain, and bone. However, autopsy series have reported metastatic infiltration of the uterus, peritoneum, retroperitoneum, meninges, intestine, and stomach [5]. Gastric metastases from a breast primary have been noted to occur in anywhere from 0.7% to 15% of patients in autopsy series [1,6]. An autopsy series by Harris et al. [5] revealed that 92/109 (84%) patients with breast cancer had distant metastatic disease at their time of death. Of those with metastatic disease, 76 (83%) had infiltrating ductal carcinoma (IDC), 14 (15%) had infiltrating lobular carcinoma (ILC), and 2 had mucoid carcinoma. Of these patients with metastatic disease, 8.7% had gastric involvement; 6/14 (43%) with ILC had linitis plastica, while 2/76 (2.6%) with IDC had discrete nodules.

Clinically, these patients present with early satiety, abdominal pain, weight loss, dyspepsia, nausea, and anorexia [1,3,4]. Radiographic evaluations may provide key points that are highly suggestive of linitis plastica. CT evaluation consists of diffuse mural thickening of the stomach wall that is greater than 1cm, while fluoroscopy demonstrates gastric rigidity and an absence of peristalsis. Endoscopic findings may reveal a normal mucosa, because tumor cells are located within the submucosa; therefore, superficial biopsies may produce false-negative results [2].

Treatment modalities for metastatic linitis plastica of the stomach include hormonal and/or chemotherapeutic regimens. These modalities can result in symptomatic as well as radiographic improvement in this patient population [1].

Fig. 4. Gastric muscularis propria with invasive tumor in an Indian-file pattern

Fig. 5. Gastric mucosa and submucosa with invasive tumor

The articles reviewed concur that all of the reported literature describes a clear pattern of linitis plastica for metastatic ILC and a discrete nodular pattern for metastatic IDC. These reports lead us to believe that either our patient had a second primary breast cancer, which never displayed itself clinically, or that IDC can indeed manifest as linitis plastica. Cormier et al. [1] reported two cases of linitis plastica in patients with a history of IDC. The first patient was thought to have a second primary cancer of the stomach that presented as linitis plastica. The second patient had a gastric malignancy,

which was diagnosed incidentally at autopsy. They also noted that a few patients with lobular breast cancer had a nodular or ulcerative involvement of the stomach.

The present case report is noteworthy since it describes a clinical entity that is not frequently encountered, along with histology that has not before been presented in the literature. The diagnosis of linitis plastica requires the primary physician to be vigilant when evaluating women, particularly those with a history of breast cancer, who present with multiple gas-

Fig. 6. Colonic submucosa with tumor cells positive for estrogen receptors. Immunoperoxidase stain

Fig. 7. Colonic muscularis propria with tumor cells positive for estrogen receptors. Immunoperoxidase stain

trointestinal (GI) complaints and weight loss. Knowing that gastric metastases are found in 0.7% to 15% of patients at the time of autopsy should prompt the physician to aggressively seek evidence of GI metastasis in those women who present with GI complaints and/or weight loss. Abdominal CT scan, upper GI series, and upper endoscopy will assist in the diagnostic evaluation. However, a full-thickness biopsy of the tissue is necessary to make the diagnosis because tumor infiltrate is within the submucosa and muscularis. Therapy consists of hormonal and chemotherapeutic regimens, with the

potential for symptomatic and radiographic evidence of improvement. This report of metastatic IDC presenting as linitis plastica of the stomach leads us to believe that the patient either had a second primary breast cancer that did not present itself clinically, or that IDC can indeed manifest as linitis plastica. Knowing the natural history of breast cancer will prevent the delayed diagnosis of those who present with GI symptoms associated with linitis plastica and will thereby lead to earlier diagnosis and initiation of hormonal and/or chemotherapeutic options.

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