

OPEN

Duodenal Adenocarcinoma Metastatic to the Breast

A Case Report

Haibo Yu, MD, Hongliang Song, MD, and Yi Jiang, MD

Abstract: Duodenal adenocarcinoma, a very rare malignant gastrointestinal tumor, mainly metastasizes via the lymphatic system. Metastases from duodenal adenocarcinomas to the breast are very uncommon.

A 31-year-old woman presented at our department with a left breast tumor. She had a past medical history of duodenal adenocarcinoma. Physical examination on admission confirmed a 2.5-cm-diameter tumor in the outer lower quadrant of the left breast. Computed tomography (CT) examination showed a soft lesion with tissue-like density and enlarged axillary lymph nodes. Local excision was performed to remove the breast lesion. The findings of cytologic, histologic, and immunohistochemistry examination indicated a breast metastasis from the previous duodenal adenocarcinoma. The patient was treated with palliative chemotherapy.

Metastases from duodenal adenocarcinoma to the breast are rare. The diagnosis depends on medical history, imaging, and pathologic examination including immunohistochemistry. An accurate diagnosis is important to avoid unnecessary surgery.

(*Medicine* 95(11):e3088)

Abbreviation: CT = computed tomography.

INTRODUCTION

Duodenal adenocarcinoma is rare; although most small bowel adenocarcinomas (56%) arise in the duodenum, small bowel cancers account for only 2% of all gastrointestinal cancers in the United States.^{1,2} It mainly metastasizes via the lymphatic system; lymph node metastases are associated with a poor prognosis.³ Here, we report a case of a young woman who we diagnosed as having a breast metastasis from a duodenal adenocarcinoma.

Editor: Eva Zapata.

Received: November 25, 2015; revised: February 5, 2016; accepted: February 10, 2016.

From the Department of Surgery (HY, HS); and Department of Pathology (YJ), The Dingli Clinical Institute of Wenzhou Medical University (Wenzhou Central Hospital), Da Jian Lane 32, Wenzhou, Zhejiang, Republic of China.

Correspondence: Haibo Yu, Department of Surgery, The Dingli Clinical Institute of Wenzhou Medical University (Wenzhou Central Hospital), Da Jian Lane 32, Wenzhou, Zhejiang, Republic of China (e-mail: zjuboby@163.com).

This study was supported by grants from Zhejiang Provincial Medical Science and Technology Planning Project (Grant Nos. 2013KYB249 and 2016KYB276). This research was approved by the Wenzhou Central Hospital Ethics Committee. Patients gave informed consent, and trial document approval was obtained from the ethics committee.

The authors have no conflicts of interest to disclose.

Copyright © 2016 Wolters Kluwer Health, Inc. All rights reserved.

This is an open access article distributed under the Creative Commons Attribution License 4.0, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. ISSN: 0025-7974

DOI: 10.1097/MD.0000000000003088

CASE PRESENTATION

A 31-year-old woman was admitted to our hospital because of a left breast tumor. Her family history was non-contributory. She had undergone pancreaticoduodenectomy for a duodenal adenocarcinoma 18 months previously and had received 6 courses of postoperative chemotherapy. A chest CT examination 4 months prior to the current presentation had shown no abnormalities. Physical examination revealed a 2.5-cm-diameter tumor in the outer lower quadrant of the left breast. Mammography showed a hyperdense mass with a circumscribed border (Figure 1) and ultrasound showed a 23-mm × 14-mm nodular low echo in the outer lower quadrant of the left breast with a non-uniform texture and a well-defined boundary. Color Doppler flow images displayed blood flow. Multiple axillary lymph nodes were identified; the largest measuring 11 mm × 5 mm (Figure 2). CT examination showed a soft 22-mm × 17-mm lesion of tissue-like density with a central patchy low-density area in the lower quadrant of the left breast with a well-defined boundary. Lymph nodes were identified in the left axilla (Figure 3B). Local excision was performed to remove the breast lesion (Figure 3A), the provisional diagnosis being invasive carcinoma. Pathologic examination of the resected specimen showed poorly differentiated adenocarcinoma (Figure 4A). Immunohistochemical analysis revealed that mammary tumor cells were positive for CDX2 (Figure 5A), villin (Figure 5B), cytokeratin 20 (Figure 5C), and cytokeratin 7 (Figure 5D), but negative for estrogen receptors (Figure 5E) and progesterone receptors (Figure 5F) and human epidermal growth factor receptor-2 (Figure 5G); 70% of the cells were Ki-67 positive (Figure 5H). Comparison of the pathological findings with those of the previous duodenal adenocarcinoma (Figure 4B) resulted in a final diagnosis of a metastasis to the breast from duodenal adenocarcinoma. The patient was then treated with palliative chemotherapy. At the time of submission of our manuscript, the patient was tolerating the new chemotherapy regimen well and had been followed for 2 months after a definitive diagnosis had been made.

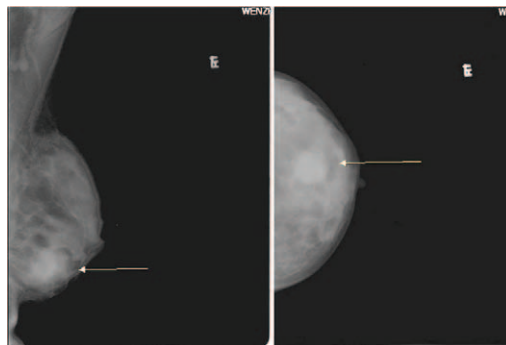


FIGURE 1. Mammography showed a hyperdense mass with a circumscribed border.

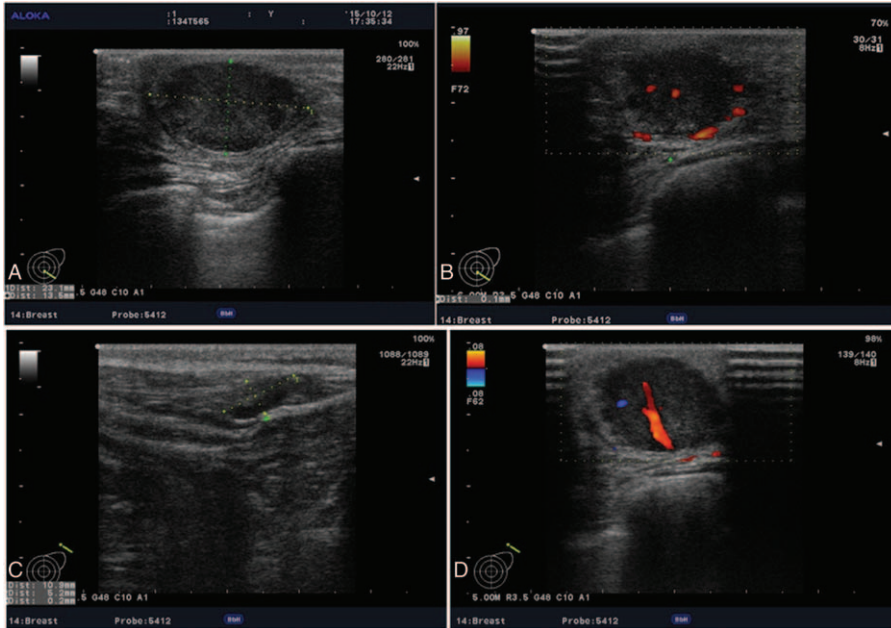


FIGURE 2. Ultrasound showed a 23-mm × 14-mm nodular low echo in the outer lower quadrant of the left breast with a non-uniform texture and a well-defined boundary. Color Doppler flow images displayed blood flow. Multiple axillary lymph nodes were identified; the largest measuring 11 mm × 5 mm.

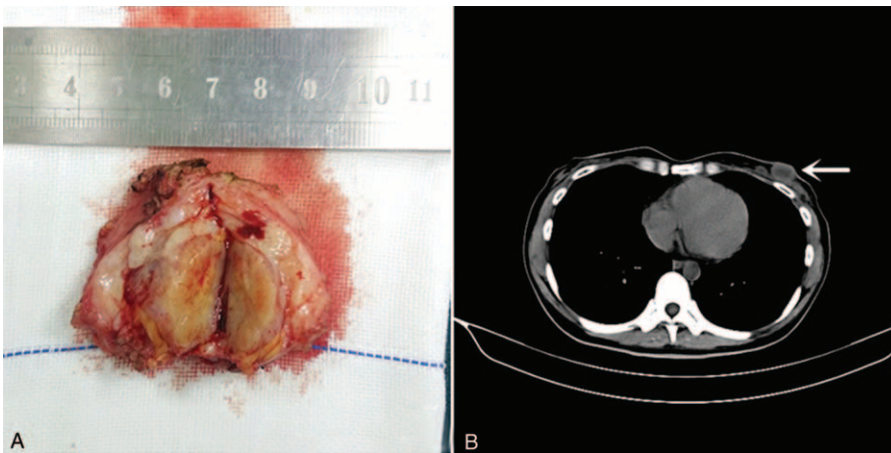


FIGURE 3. A. Gross examination showed the breast lesion with the diameter of 2.5 cm in the outer lower quadrant of the left breast. B. Computed tomography examination showed a soft 22-mm × 17-mm lesion of tissue-like density with a central patchy low-density area in the lower quadrant of the left breast with a well-defined boundary.

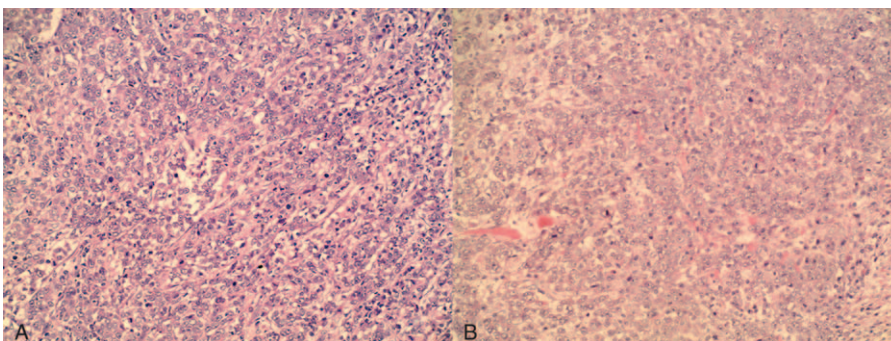


FIGURE 4. A. Metastatic duodenal adenocarcinoma to the left breast (H&E, 200×). B. Duodenal adenocarcinoma (H&E, 200×).

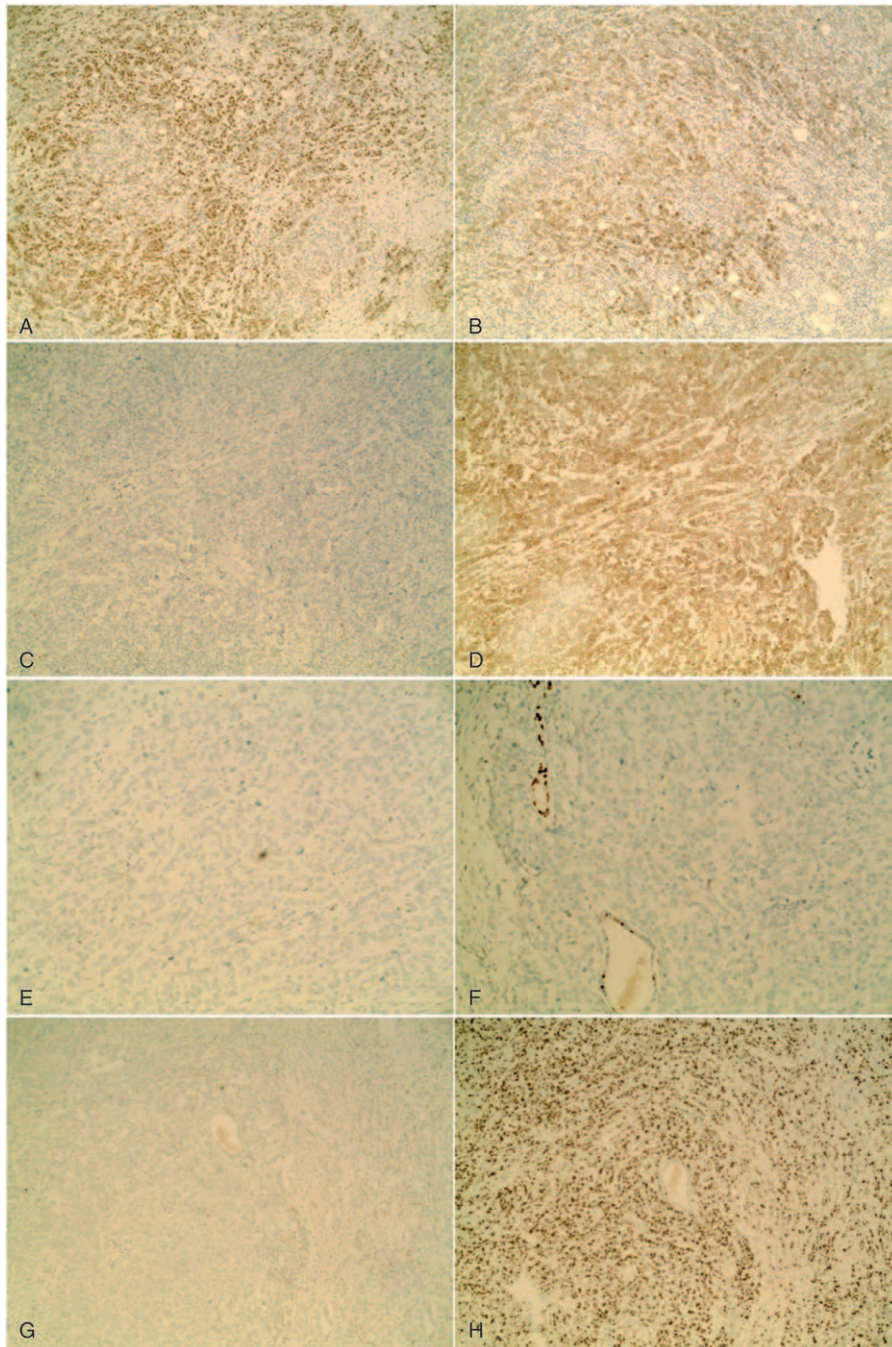


FIGURE 5. Immunohistochemical analysis revealed the mammary tumor cells were positive for CDX2 (A), villin (B), cytokeratin 20 (C), and cytokeratin 7 (D), but negative for estrogen receptors (E) and progesterone receptors (F) and human epidermal growth factor receptor-2 (G); 70% of the cells were Ki-67 positive (H).

DISCUSSION

Breast cancer is the commonest type of malignant tumor in women; however, metastases to the breast from extramammary malignancies are very rare, accounting for only 0.43% of all malignant breast tumors.⁴ The most common sources of such metastases are malignant melanoma, pulmonary, ovarian, renal, cervical, prostate, stomach, thyroid, and colorectal carcinomas, and small bowel carcinoid tumors.⁵⁻⁹ To the best

of our knowledge, this is the first reported case of duodenal adenocarcinoma metastasizing to the breast. Our patient presented after she had detected a breast mass. A chest CT examination 4 months previously had not shown a breast tumor. She had a history of resection of a duodenal carcinoma. We, therefore, strongly suspected that the breast tumor might be metastatic carcinoma. However, ultrasound and mammography did not suggest a malignant tumor. The patient

underwent resection of the breast tumor and comparison of the pathological sections of the excised specimen with those of the previous duodenal adenocarcinoma resulted in a diagnosis of a metastasis from the duodenal carcinoma to the breast. The correct diagnosis was, therefore, crucial in avoiding unnecessary surgical interventions.

A diagnosis of metastasis to the breast must be confirmed by pathologic examination. When a patient's history reveals a previous primary malignancy, the pathological characteristics, including immunohistochemical findings, of a breast lesion should be compared with those of the previous primary tumor. A specific diagnosis cannot be made by imaging procedures, such as mammography, ultrasound or CT. On mammography, breast metastases reportedly present as round lesions with smooth margins.¹⁰ The imaging findings in our case suggested a benign tumor; however, pathological examination resulted in a diagnosis of metastatic poorly differentiated adenocarcinoma. Thus, the final diagnosis depends on surgical resection or biopsy. Breast cancer can metastatic to the duodenum,¹¹ there might be some relationship between the 2 organ, but the mechanism is not yet understood and needs further study.

CONCLUSIONS

Our patient illustrates that metastasis to the breast from duodenal adenocarcinoma does occur. Despite its rarity, it should be considered in the differential diagnosis of an apparent primary mammary carcinoma because the treatment and prognosis differ significantly. Those working in the field of breast diagnosis and therapy should be aware of the possibility of metastases to the breast.

REFERENCES

1. Bilimoria KY, Bentrem DJ, Wayne JD, et al. Small bowel cancer in the United States: changes in epidemiology, treatment, and survival over the last 20 years. *Ann Surg*. 2009;249:63–71.
2. Hatzaras I, Palesty JA, Abir F, et al. Small-bowel tumors: epidemiologic and clinical characteristics of 1260 cases from the connecticut tumor registry. *Arch Surg*. 2007;142:229–235.
3. Poultsides GA, Huang LC, Cameron JL, et al. Duodenal adenocarcinoma: clinicopathologic analysis and implications for treatment. *Ann Surg Oncol*. 2012;19:1928–1935.
4. Koch A, Richter-Marot A, Wissler MP, et al. Mammary metastasis of extramammary cancers: current knowledge and diagnostic difficulties. *Gynecol Obstet Fertil*. 2013;41:653–659.
5. Sato T, Muto I, Fushiki M, et al. Metastatic breast cancer from gastric and ovarian cancer, mimicking inflammatory breast cancer: report of two cases. *Breast Cancer*. 2008;15:315–320.
6. Mihai R, Christie-Brown J, Bristol J. Breast metastases from colorectal carcinoma. *Breast*. 2004;13:155–158.
7. Alvarado Cabrero I, Carrera Alvarez M, Perez Montiel D, et al. Metastases to the breast. *Eur J Surg Oncol*. 2003;29:854–855.
8. Vizcaino I, Torregrosa A, Higuera V, et al. Metastasis to the breast from extramammary malignancies: a report of four cases and a review of literature. *Eur Radiol*. 2001;11:1659–1665.
9. Georgiannos SN, Chin J, Goode AW, et al. Secondary neoplasms of the breast: a survey of the 20th Century. *Cancer*. 2001;92:2259–2266.
10. Klingen TA, Klaasen H, Aas H, et al. Secondary breast cancer: a 5-year population-based study with review of the literature. *APMIS*. 2009;117:762–767.
11. Wang X, Meng X, Zhang T, et al. A case of breast cancer found as metastasis to the duodenum. *J Cancer Res Exp Oncol*. 2009;1:12–14.