Case report

Acute appendicitis secondary to metastatic breast cancer. 12 Years after first primary tumor diagnosis. A case report

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ABSTRACT

Introduction: Metastatic adenocarcinoma to the appendix is an uncommon finding, there are few published cases in the literature of appendicitis from metastatic breast carcinoma.

Presentation of case: A 51-year-old female was admitted to the emergency department with a presumptive diagnosis of acute appendicitis with a past medical history of stage IV Breast Cancer 12 years ago. Appendectomy was performed, finding a perforated appendix. Anato-mopathology examination revealed a semi-differentiated carcinoma involving the tip of the appendix.

Discussion: Gastrointestinal tract (GIT) metastases of breast carcinoma are an uncommon finding. Appendiceal metastases are a very uncommon finding, and the interval between diagnosis of the primary carcinoma and the metastases can be many years. There are no reports about whether right hemicolectomy provides better oncological outcomes than an appendectomy in stage IV BC.

Conclusion: There are no guidelines for the management of this disease but unquestionably, multidisciplinary management leads to better outcomes.

1. Introduction

Breast cancer is one of the most common cancers in the world [1]. The most common sites of metastasis are the lymph nodes, lungs, bones, brain, and liver, luminal gastrointestinal tract involvement is less common and involvement of the appendix is very rare [2–4]. Most of these patients present with acute appendicitis (AA), and they undergo an appendectomy, however, the survival prognosis is given by subsequent systemic treatment [5]. Herein we report a case of a 51-year-old female with AA secondary an appendiceal metastasis (AM), 12 years after being diagnosed with breast cancer (BC).

This patient was managed in a public healthcare system setting. The work has been reported in line with the SCARE criteria and the revised 2020 SCARE guidelines [6].

2. Presentation of case

A 51-year-old Caucasian female was admitted on wheelchair by her husband to the emergency department with a 1-day history of right lower quadrant (RLQ) abdominal pain, and nausea. At admission, she had a temperature of 37.7 °C and physical examination revealed local RLQ pain and tenderness. She had a past medical history of stage IV BC 12 years ago with no relevant family medical history. She received four cycles of epirubicin and cyclophosphamide therapy followed by four cycles of paclitaxel as preoperative chemotherapy. She had a right total mastectomy with axillary dissection with 3 of 15 nodes positive for metastatic tumor, stage II. Estrogen Receptor (ER), Progesterone Receptor (PR), and Human Epidermal Growth Factor Receptor 2 (HER-2) were negative. Thereafter, radiation therapy was complete. Ten years later, she presented with a new nodule in the left breast, and suggestive images of secondarism in lumbar spine and left kidney. She was started on letrozole and ribociclib therapy with stable disease until her current presentation. Pathology from the left breast nodule informed invasive lobular carcinoma. IH was positive for ER, PR and GCDFP-15, and negative for HER-2. Microscopy of the spine lesion revealed bone infiltrated by atypical epithelial cells and the IH was the same as the lesion of the left breast. She was started on letrozole and ribociclib therapy with stability in disease till her current presentation.

Computed tomography (CT) showed an enlarged appendix with periappendiceal fat stranding, suggestive of acute appendicitis (Figs. 1,
3. Discussion

The most common site of metastasis breast cancer (MBC) is bone [7]. Gastrointestinal tract (GIT) metastases of breast carcinoma are an uncommon finding, less than 15% of breast carcinomas metastasize to the GIT and may raise difficulties problems of management. When it occurs, the stomach, small bowel, and large bowel are most commonly affected. AM is a very uncommon finding, and the interval between diagnosis of the primary carcinoma and the metastases may be many years [4,8–10]. Studies have previously shown that the spread of breast cancer metastases is influenced by two important factors: the first is ER status, negative tumors have a higher likelihood for the GIT, and the second is the pathology of cancer, lobular carcinomas are more likely to metastasize to the GIT [6,11].

Connor et al. reported in 7970 appendicectomies, 74 cases were appendiceal tumors (AT), and only 11 were metastatic tumors, the most common clinical presentation of the AT was AA (49%) [12]. Yoon et al. also report 139 cases of secondary AT. The most common primary origin was ovarian (56 cases) [5]. In 1946, Oldfield reported the first case of MBC manifesting as AA [13]. A literature review reveals only 16 prior cases of MBC with the involvement of the appendix. Most patients underwent appendectomy (10/16) [14].

Isolated metastases to the appendix are rare. The majority of metastases are likely to be results of peritoneal seeding [5]. Histological characteristics of metastatic cancer of the appendix include gradual serosa invasion. The mucosal layer is usually intact [15]. The incidence of benign diseases of the appendix like AA and primary tumors of the appendix is much higher than metastatic tumors of the appendix even in a patient with history of cancer, and the clinical manifestations are difficult to distinguish. The ovary was the most common primary origin, followed by the colorectum and stomach [5]. When metastases occur in the digestive tract, there are usually other organs with disseminated disease [8]. The only manifestation that could be attributed to the secondary AT themselves was AA [5]. The symptoms of early acute appendicitis are often unclear. Radiation or chemotherapy for metastases can both alter clinical manifestations, also these patients are immune-compromised, all of this can result in delayed diagnosis [16].

Even today findings are quite non-specific, CT is the gold standard for the diagnosis of an AT [17]. PET scanning can be useful in diagnosis those patients with stage IV who do not present with abdominal pain. Non-tumoral perforated appendicitis and perforated appendicular tumors are mainly difficult to differentiate [18].

With the advent of new multimodal therapy, the survival of patients with MBC has increased [1]. Although the management of metastatic breast disease has evolved, the median survival after the discovery of GIT metastases is poor. Yoon et al., report the median survival after the diagnosis of secondary appendix tumors was 22.6 months [5]. Multimodality treatment with systemic therapy was the only factor associated with prolonged survival [4,5,9]. Another optional treatment described in premenopausal hormone receptor-positive metastatic breast cancer patients is bilateral salpingo-oophorectomy or gonadotropin-releasing hormone agonists combined with aromatase inhibitors, which improves survival and lowers morbidity in these patients [19]. AA secondary to breast tumors metastases may be treated by an appendectomy, there are no reports about whether right hemicolec omy provides better oncological outcomes than an appendectomy in stage IV BC. Some authors propose a prophylactic appendectomy in patients who will be requiring abdominal surgery [20], but this has no evidence to support it.

4. Conclusion

GIT breast metastases are rare and may occur years after the initial diagnosis of the primary tumor, this may mean a problem in the management of these patients. Appendicitis caused by breast cancer is very rare, however, given the increased survival of advanced-stage patients, metastases in unusual locations can become more frequent. Also,
chemotherapy can remarkably alter the symptoms, signs, and management of such patients, making the diagnosis a challenge. A collaboration of clinical, laboratory, and imaging findings is often needed for diagnosis, also involvement of the GIT can be anticipated, especially for those with a previous history of breast cancer stage IV. The survival of these patients is led by chemotherapy and not for the surgery, a pathological diagnosis of the metastatic tumor could be very useful for selecting the most effective subsequent therapy. Although the prevalent etiology of appendicitis is an inflammatory disease, oncological etiologies must be taken into account to find the correct treatment in patients with history of advance breast cancer. There are no guidelines for the management of this disease but, unquestionably, that multidisciplinary management leads to better outcomes.

Financial disclosure

None to report.

Ethical approval

The institutional review board (IRB) approved this study. This study was conducted in conformance with the 2008 Helsinki Declaration.

Consent

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

Guarantor

Victoria G. Hughes

Credit authorship contribution statement

Hughes V.G. wrote the manuscript and is the article guarantor. Osicar P. and Ramallo D. wrote the manuscript, provided de photos and revised the manuscript for intellectual content.

Declaration of competing interest

None to report.

References

[1] H. Sung, J. Ferlay, R.L. Siegel, Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries, CA Cancer J. Clin. 71 (3) (2021) 209–249.
[2] E.F. Solomayer, I.J. Diel, G.C. Meyberg, Metastatic breast cancer: clinical course, prognosis and therapy related to the first site of metastasis, Breast Cancer Res. Treat. 59 (3) (2000) 271–278.
[3] A.S. Gifaldi, J.G. Petros, G.R. Wolfe, Metastatic breast carcinoma presenting as persistent diarrhea, J. Surg. Oncol. 51 (3) (1992) 211–215.
[4] K. Uygun, Z. Kocak, S. Altaner, Colonic metastasis from carcinoma of the breast that mimics a primary intestinal cancer, Yonsei Med. J. 47 (4) (2006) 578–582.
[5] W.J. Yoon, Y.B. Yoon, Y.J. Kim, Secondary appendiceal tumors: a review of 139 cases, Gut Liver 4 (3) (2010) 351–356.
[6] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, SCARE Group, The SCARE 2020 guideline: updating consensus Surgical CAse Report (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–230, https://doi.org/10.1016/j.ijsu.2020.10.034.
[7] J.R. Harris, M.E. Lippman, C.K. Osborne, Diseases of the Breast, Lippincott Williams & Wilkins, 2012.
[8] K. Tsujimura, T. Teruya, M. Kiyuna, Colonic metastasis from breast carcinoma: a case report, World J. Surg. Oncol. 15 (1) (2017) 124. Published 2017 Jul 5.

[9] S. Dhar, M.N. Kulaylat, K. Gordon, Solitary papillary breast carcinoma metastasis to the large bowel presenting as primary colon carcinoma: case report and review of the literature, Am. Surg 69 (9) (2003) 799–803.

[10] B.G. Taal, F.C. den Hartog Jager, R. Steinmetz, The spectrum of gastrointestinal metastases of breast carcinoma: II. The colon and rectum, Gastrointest. Endosc. 38 (2) (1992) 136–141.

[11] J.L. Dirksen, M.G. Souder, A.J. Burick, Metastatic breast carcinoma presenting as perforated appendicitis, Breast Care (Basel) 5 (6) (2010) 409–410, https://doi.org/10.1159/000322656.

[12] S.J. Connor, G.B. Hanna, F.A. Frizelle, Appendiceal tumors: retrospective clinicopathologic analysis of appendiceal tumors from 7,970 appendectomies, Dis. Colon Rectum 41 (1) (1998) 75–80.

[13] M.C. Oldfield, Individual resistance to malignant disease; illustrated by a case in which a metastatic deposit from a carcinoma of the breast occurred in the appendix and led to perforation and peritonitis, Br. Med. J. 2 (1946) 153–155.

[14] L. Numan, S. Asif, O.K. Abughanim, Acute appendicitis and small bowel obstruction secondary to metastatic breast cancer, Cureus 11 (5) (2019), e4706. Published 2019 May 21.

[15] A. Weisberg, Metastatic adenocarcinoma of the breast masquerading as Crohn’s disease of the colon, Am. J. Proctol. Gastroenterol. Colon Rectal Surg. 33 (5) (1982) 10–22.

[16] S.D. Hsu, S.J. Chou, H.F. Hsieh, A case of breast carcinoma, chemotherapy, and acute appendicitis [published correction appears in Lancet. 2006 Nov 11;368(9548):1650], Lancet 368 (9540) (2006) 1038.

[17] S. Whiteley, P. Sookur, N. Power, A. McLean, The appendix on CT, Clin. Radiol. 64 (2) (2009) 190–199.

[18] G.L. Bennett, T.P. Tanpitukpongse, M. Macari, CT diagnosis of mucocele of the appendix in patients with acute appendicitis, AJR Am. J. Roentgenol. 192 (3) (2009).

[19] A Oseledchyk ML Gemignani QC Zhou A Iasonos R Elahjji Z Adamou . Surgical Ovarian Suppresion for Adjuvant Treatment in Hormone Receptor Positive Breast Cancer in Premenopausal Patients.

[20] P.R. Maddox, Acute appendicitis secondary to metastatic carcinoma of the breast, Br. J. Clin Pract. 44 (9) (1990) 376–378.