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# Metastatic Breast Cancer to the Common Bile Duct Presenting as Obstructive Jaundice

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## Key Words

Metastatic breast cancer · Common bile duct · Obstructive jaundice

## Abstract

Metastatic breast cancer is typically identified in the bones, lymph nodes, lungs and liver. Rarely does metastatic breast cancer involve the common bile duct (CBD) without direct extension from liver metastasis into the CBD. We present a woman diagnosed with metastatic breast cancer in the CBD after presenting with obstructive jaundice. Patients with a history of primary breast cancer who present with obstructive jaundice secondary to CBD mass need identification of the mass in order to provide appropriate treatment.

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## Introduction

Breast cancer is the most common malignancy in women, accounting for 29% of all tumors [1]. It is one of the main causes of cancer-related deaths seen in women, with only lung cancer having a higher mortality rate [2]. One-third of women with breast cancer will develop metastatic spread and 10% of these patients will have metastatic spread at the time of diagnosis [3]. Metastatic breast cancer is typically identified in the brain, bones, lymph nodes, lungs and liver. Metastatic breast cancer may involve the extrahepatic ducts via direct extension of liver metastasis into the intrahepatic ducts with extension into the extrahepatic ducts. Hematogenous metastasis to the extrahepatic ducts or the common bile duct (CBD) without liver involvement is exceptional.

Obstructive jaundice from extrahepatic bile duct strictures has a broad differential, including intrinsic impediment and extrinsic compression. Sources of extrinsic compression

include lymphadenopathy, pancreatic head mass and obstruction caused by an impacted stone in the cystic duct or Hartmann's pouch of the gallbladder, known as Mirizzi syndrome. Intrinsic strictures include choledocholithiasis, sclerosing cholangitis, cholangitis, infection, papillary edema or intraductal mass.

Cholangiocarcinoma accounts for 80% of all cases of intraductal mass [1]. Early identification and surgical resection of cholangiocarcinoma has been demonstrated to improve 5-year survival. This leads to surgical resection despite 13–24% of masses being indeterminate before surgery [1]. Improvements in intraductal biopsy and brushing techniques have improved the sensitivity and specificity of cholangiocarcinoma, but secondary to prominent fibrous stromal components separating small islands of malignant epithelium, the diagnosis can be difficult with brushing and biopsy. The vast majority of patients receive surgical intervention without the consideration of other etiologies due to the difficulty in identifying the origin of the intraductal mass.

The other 20% of intraductal masses are divided into pancreatic adenocarcinoma with extension into the CBD, IgG4-related sclerosing cholangitis, intraductal papillary mucinous tumor of the bile ducts or metastatic disease. Colon and hepatocellular carcinoma are the most common cancers to metastasize to the biliary system. Limited case reports have described spread from other sources, such as lung and breast.

We report a case of obstructive jaundice in a woman with a history of primary breast cancer diagnosed 23 years prior, with a CBD mass found to be metastatic breast cancer, and discuss the relevance of intraductal mass identification to tailor treatment and avoid unnecessary surgical intervention.

### Case Presentation

A 70-year-old female presented with jaundice, nausea, vomiting and a 10-pound weight loss over a 2-month period (original weight 110 pounds). Breast cancer was initially discovered in 1992. She had a 1.0-cm, estrogen and progesterone receptor-positive, HER2-negative, T1N2 carcinoma of the left breast. She was treated by lumpectomy with radiotherapy, followed by a single cycle of cyclophosphamide, Adriamycin and fluorouracil chemotherapy, then two cycles of cyclophosphamide, methotrexate and fluorouracil chemotherapy. She declined additional adjuvant therapy because of unacceptable toxicities. A local in-breast recurrence was documented in 1994 when a 0.6-cm focus of infiltrating ductal carcinoma was resected. She was offered, but declined mastectomy. Multiple foci of left breast and chest wall recurrence were documented in 2001. Once again, she initially declined surgical resection. She was treated with radiotherapy, but eventually required mastectomy including resection of the pectoralis fascia. Pathology showed multiple foci of carcinoma, and multiple surgical margins were positive. She consented to adjuvant therapy with anastrozole, which she took until 2004. She discontinued treatment then because of musculoskeletal and neuropsychiatric toxicities. There was no evidence of disease recurrence until the summer of 2013 when a subcutaneous nodule on the back was identified, and biopsy showed metastatic adenocarcinoma consistent with a breast primary. Positron emission tomography (PET) imaging showed multiple subcutaneous and intramuscular metastases, a left lingular metastasis and a right axillary node metastasis (fig. 1, fig. 2). She was treated briefly with tamoxifen but stopped after a few months because of neuropsychiatric toxicities.

Physical examination revealed scleral icterus with yellowing of the skin, but no abdominal tenderness and no abdominal masses, bilirubin 8.1 mg/dl, AST 121 IU/l, ALT 115 IU/l and ALP 297 IU/l. Computed tomography (CT) showed a 1.8-cm mass at the head

of the pancreas that abutted on and partially obstructed the CBD (fig. 3, fig. 4). Endoscopic ultrasound (EUS) demonstrated a mass in the mid portion of the CBD measuring 1.4 × 1.3 cm with resultant dilation of the proximal bile duct to 12 mm (fig. 5). Fine needle aspiration was taken and demonstrated metastatic breast cancer. A 10 Fr by 7 cm plastic stent was placed across the stricture and across the ampulla.

## Discussion

Metastatic cancer to the biliary ducts has a low incidence, with colon cancer being the most common distant primary tumor to invade the bile ducts. Breast cancer involving the bile ducts more commonly occurs secondary to metastatic liver lesions with direct extension into the intrahepatic ducts, with subsequent progression into the extrahepatic ducts and CBD. Metastatic breast cancer may also spread to regional lymph nodes of the bile duct and lead to direct extension into the bile ducts. Hematogenous spread to the extrahepatic or CBD is rare. Twenty-seven cases of metastatic breast cancer to the bile ducts are reported in the literature, with 10 cases involving the extrahepatic duct, 6 cases involving extrahepatic lymph nodes with direct extension into the bile duct, 2 cases of ampulla of Vater with extension into the CBD, 3 undetermined cases and 6 cases of CBD involvement [1, 3–9].

Masses proximal to the common hepatic duct are difficult to identify prior to surgery secondary to the low sensitivity of diagnostic tools. Endoscopic retrograde cholangiopancreatography with brushing carries a sensitivity of 25–50%, and even advances in endoscopic techniques with EUS have still shown low sensitivity for diagnosis [10]. EUS evaluation of the distal bile duct, CBD to the ampulla, has utility in determining intraluminal versus extraluminal masses. In addition, EUS with fine needle aspiration has improved sensitivity in the distal bile duct compared to the proximal bile duct (84 vs. 59%) [10]. Thus, EUS is a valuable tool in the diagnosis of distal bile duct masses.

The identification of distal bile duct masses is crucial because treatment is different for cholangiocarcinoma compared to metastatic disease. Patients identified with metastatic breast cancer in the biliary system need a long-term palliative treatment strategy with both medical intervention and endoscopic or surgical intervention to improve quality of life. A variety of chemotherapy strategies are available for metastatic breast cancer and should be tailored for each patient along with endocrine therapy in tumors positive for estrogen and progesterone receptors [11, 12]. HER2 receptor-positive metastatic disease should be treated with trastuzumab in addition to chemotherapy [13]. Multiple trials have demonstrated that placement of uncovered self-expanding metal stents in patients with malignant obstruction of the CBD improves quality of life [14–16].

Our patient was originally thought to have a cholangiocarcinoma and was evaluated for a pancreaticoduodenectomy. Cytology of the distal bile duct mass demonstrated metastatic breast cancer that was hormone receptor-positive, and she was placed on chemotherapy and endocrine therapy. Symptomatic relief was achieved by a plastic stent placed across the obstruction and her jaundice and abdominal pain improved.

In conclusion, patients with a history of malignancy found to have obstructive jaundice from a CBD mass should undergo further investigation to determine primary biliary cancer versus metastatic disease in order to provide appropriate surgical and medical management.

## Acknowledgement

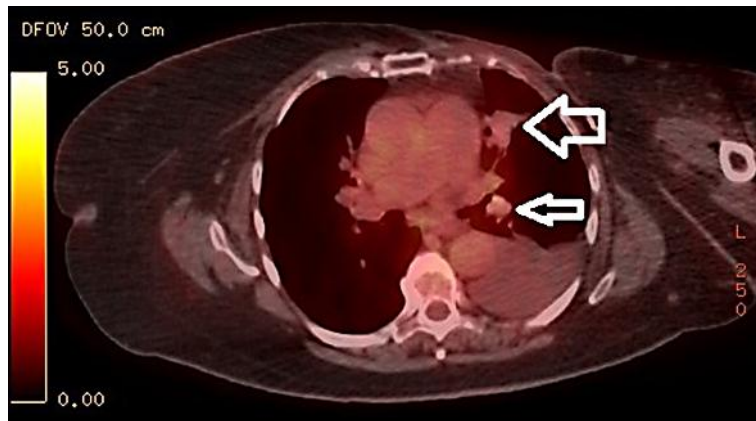
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## Disclosure Statement

The authors report no conflict of interest with this case report. A portion of this case was presented at the national meeting of the American College of Gastroenterology, October 2014, as a poster.

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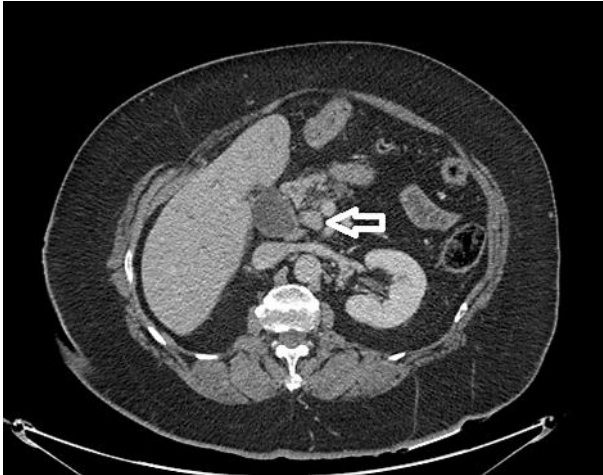
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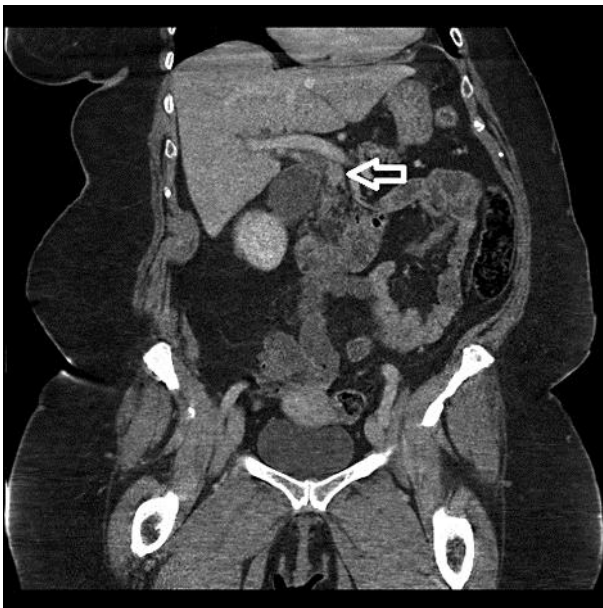
**Fig. 1.** PET demonstrated multiple lesions in the lingular left lung. The arrows point at ‘hot nodules’ found to be metastatic breast cancer in the left lung.



**Fig. 2.** PET demonstrated a lesion in the right axilla. The arrow points at a ‘hot nodule’ found to be metastatic spread of the patient’s primary breast cancer.

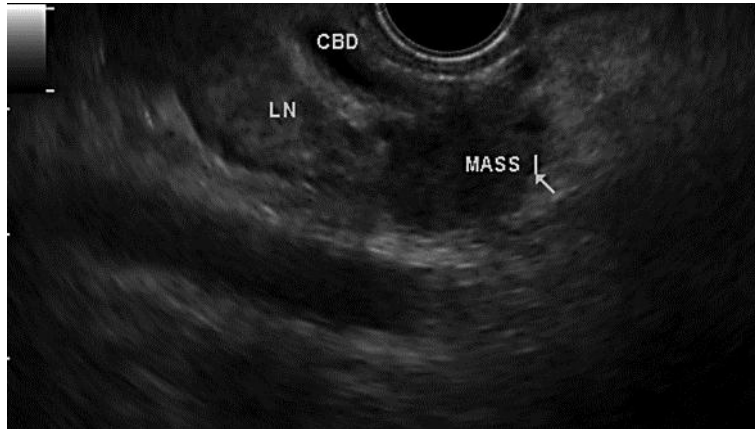


**Fig. 3.** CT of the abdomen and pelvis demonstrated a mass in the CBD with no liver involvement. The arrow points at metastatic breast cancer in the CBD, with dilation of the CBD distal to the mass.



**Fig. 4.** CT of the abdomen and pelvis demonstrated a mass in the CBD with no liver involvement. The arrow points at metastatic breast cancer in the CBD, with dilation of the CBD distal to the mass.

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**Fig. 5.** EUS demonstrated a mass in the CBD with adjacent lymphadenopathy and dilated CBD. LN = Lymph node.