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Case Report

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A Case of Colon Cancer with Breast Metastasis and Krukenberg Tumor

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ABSTRACT

Colorectal cancer most commonly metastasizes to the liver and lung. Metastatic colon carcinoma (MCC) to the breast is extremely rare. Krukenberg tumor is an uncommon metastatic tumor of the ovary.

Case presentation: a 38 years woman presented with abdominal pain. In evaluation colon cancer was diagnosed at stage 3. FOLFOX chemotherapy was done. After one year she developed Krukenberg tumor. Few days after ovarian tumor resection breast tumor was diagnosed. in immunohistochemistry both ovarian and breast tumors was CK7 negative, CK20 positive, compatible with colon cancer origin. This is the first case of simultaneous metastasis of colon cancer to two rare sites.

Key words: Colon cancer, Breast metastasis, Krukenberg tumor

INTRODUCTION

Colorectal cancer most commonly metastasizes to the liver and lung and metastatic colon carcinoma (MCC) to the breast is extremely rare and is usually in the context of widespread disease.[1, 2] The development of breast metastases is exceptionally rare, account for 0.43% of all breast malignancies and is associated with poor clinical outcome.[3]

Krukenberg tumor is a metastatic signet ring cell adenocarcinoma of the ovary. Krukenberg tumor is uncommon, accounting for 1% to 2% of all ovarian tumors. Stomach is the primary site in most Krukenberg tumor cases (70%). Carcinomas of colon, appendix, and breast (mainly invasive lobular carcinoma) are the next most common primary sites.[5] Rare cases of Krukenberg tumor originating from carcinomas of the gallbladder, biliary tract, pancreas, small intestine, ampulla of Vater, cervix, and urinary bladder/urachus have been reported.[5] We report a case of Krukenberg tumor in a 38 years woman with colon cancer and simultaneously breast metastasis.

CASE PRESENTATION

A 38-year -old woman presented with severe generalized colicky abdominal pain and 2-5 times bowel habit per day. After two weeks, melena was added to her symptoms. After colonoscopy, adenocarcinoma of ascending colon was diagnosed. The stage of tumor was T3N1M0 (only 2 lymph nodes were evaluated). she received 12 times FOLFOX4 chemotherapy regimen. Fifteen months after surgery, she was developed secondary amenorrhea and was visited by a gynecologist. In pelvic sonography and then in abdominopelvic CT scan a large ovarian mass was seen (figure 1-A). Before this problem, follow up colonoscopy had been done that was normal. Total abdominal hysterectomy and bilateral ophorectomy were

done. Both ovaries were involved and in immunohistochemistry (IHC) the tumor was CK7- and CK20+ (figure 1-C &D), compatible with colon cancer origin.

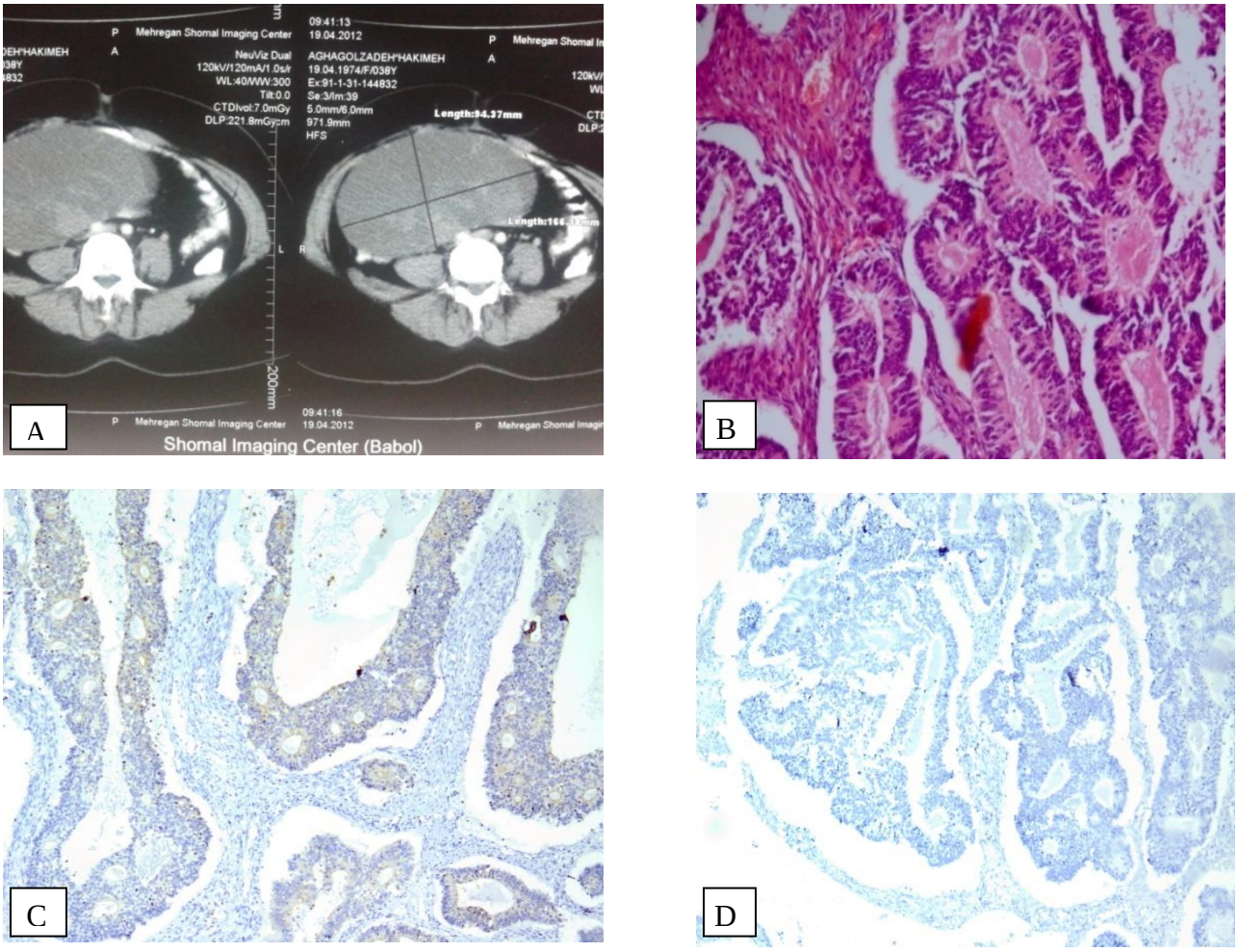

Figure1: ovarian tumor (**A:** CT scan **B:** Histopathology **C:** CK 20 **D:** CK 7)

Few days after ovarian mass resection, the patient palpated one lump in her left breast. Mammography was reported normal (figure 2-A) but sonography showed a mass in left breast. Core needle biopsy was done and pathology was reported invasive breast carcinoma. Mastectomy and axillary lymph node dissection was done. A 9 centimeters mass was detected and axillary lymph nodes were involved (Figure 2-C). In IHC, CK7, estrogen receptor(ER), progesterone receptor (PR), E-cadherin and Her-2 overexpression were negative and CK20 was positive(Figure 2-D & E) compatible with colonic origin of metastasis. Chemotherapy was started again. The patient is symptom free after 8 months of post chemotherapy period although CEA was raised without gross relapse.

DISCUSSION

Primary breast cancer is one of the most common malignancies but Metastases to the breast from extra mammary malignancies are rare.[6] Kyoung Tae Noh and et al., were found only 22 cases in searching MEDLINE and EMBASE including non-English literature, and hand searching the references. A malignant mass in the breast can easily be misinterpreted as breast cancer and

inappropriate surgical intervention could be carried out.[4]

Generally, metastases to the breast from extra mammary malignancies are characterized by rapidly growing, mobile masses that are easily palpable but do not cause overlying skin or nipple retraction, or bloody nipple discharge.[4] Mammographic evaluation can be useful in the differential diagnosis of primary versus secondary breast cancer. The mammographic finding in such a case is a rounded and well-circumscribed mass. Typically, there is no spiculation, microcalcification or thickening of the skin. Differential diagnosis between primary and metastatic breast neoplasms is not always easy. Because treatment can differ profoundly, accurate diagnosis is of paramount importance to avoid unnecessary radical surgical procedures. Excisional or incisional biopsy is the most commonly used procedure for diagnosis.[7] immunohistochemistry can help to make an accurate diagnosis. The great majority of breast tumors are CK7 positive and CK20 negative, while colorectal carcinomas are usually CK7 negative and CK20 positive. When a breast tumor is negative for all breast markers (ER, PR, Her2, GCDP15, BCA, and CK7) and positive for CK20 and CDX2, this identifies the tumor as being colon cancer metastatic to the breast.[4, 7] Although in our patient CDX2 did not check, IHC profile confirmed colon cancer metastasis.

According to recent reports, the management of metastatic breast mass from colorectal adenocarcinoma should be diagnostic and palliative. Barthelmes et al., advocated that surgical excision should be avoided in the view of short life expectancy and risk of seeding to the skin.[8] Fernández de Bobadilla et al., suggested that excisional biopsy was usually appropriate and provided adequate local control.[9] If the diagnosis for the breast mass is unclear, unnecessary intervention, for example mastectomy or lymph node dissection of axilla, can be performed.[4] In our case, mastectomy was done before definite diagnosis and before consult with oncologist but aggressive procedure for this patient may be one explanation for prolonged symptom free survival of the patient.

The Krukenberg tumor was originally described by Paget (1854).The eponym is attributed to Dr. Friedrich Krukenberg, a German gynaecologist and pathologist. Krukenberg tumors are pathologically "signet ring cell" ovarian adenocarcinoma. They account for 1-2% of all ovarian tumors world-wide. Women are typically diagnosed with Krukenberg tumors in the perimenopausal fifth decade of life.[10] Krukenberg tumor is more common in premenopausal women than in postmenopausal women.[11, 12] It is hypothesized that this young age of diagnosis is related to the great vascularity of their ovaries, which facilitates vascular metastasis.[10] Kiyokawa T. and et al., analyzed 120 Krukenberg tumors. The patients' average age was 45 years with 43% of them under 40 years. Our patient was 38 years. Abdominal swelling or pain usually accounted for the clinical presentation (such as our case).[13] Krukenberg tumors are bilateral in 80% of cases. The route of metastasis from the gastrointestinal tract to the ovaries is hypothesized to be via lymphatic. The mortality rate for Krukenberg tumors is relatively high and a majority of patients die within two years of diagnosis.[10]

Krukenberg tumors can be diagnosed before, after, or at the same time as diagnosis of the GI primary tumor. The prognosis worsens when the primary tumor is identified after the metastasis to the ovary is discovered.[10, 11]

The distinction between a primary ovarian mucinous carcinoma or even a borderline mucinous tumor and a metastatic mucinous carcinoma may be difficult. A constellation of clinical, gross pathologic and morphologic features is used in this distinction. One of the most important morphologic features suggesting a metastatic mucinous carcinoma in the ovary is the presence of signet ring cells; these are considered rare in primary ovarian mucinous tumors. Features favoring a primary rather than a metastatic neoplasm are unilateral tumor, low stage, and background of adenofibroma or cystadenoma.[11] Primary ovarian tumors, usually test positive for CK 7 and negative for CK 20 in IHC.[10]

In literature review we do not found any case of colon cancer with both ovarian and breast metastases in the same time.

CONCLUSION

As our knowledge we report first case of simultaneously two rare sites of colon cancer. In a patient with history of malignancy, a breast mass should be diagnosed correctly with core needle and IHC, to avoiding unnecessary mastectomy for breast metastasis.

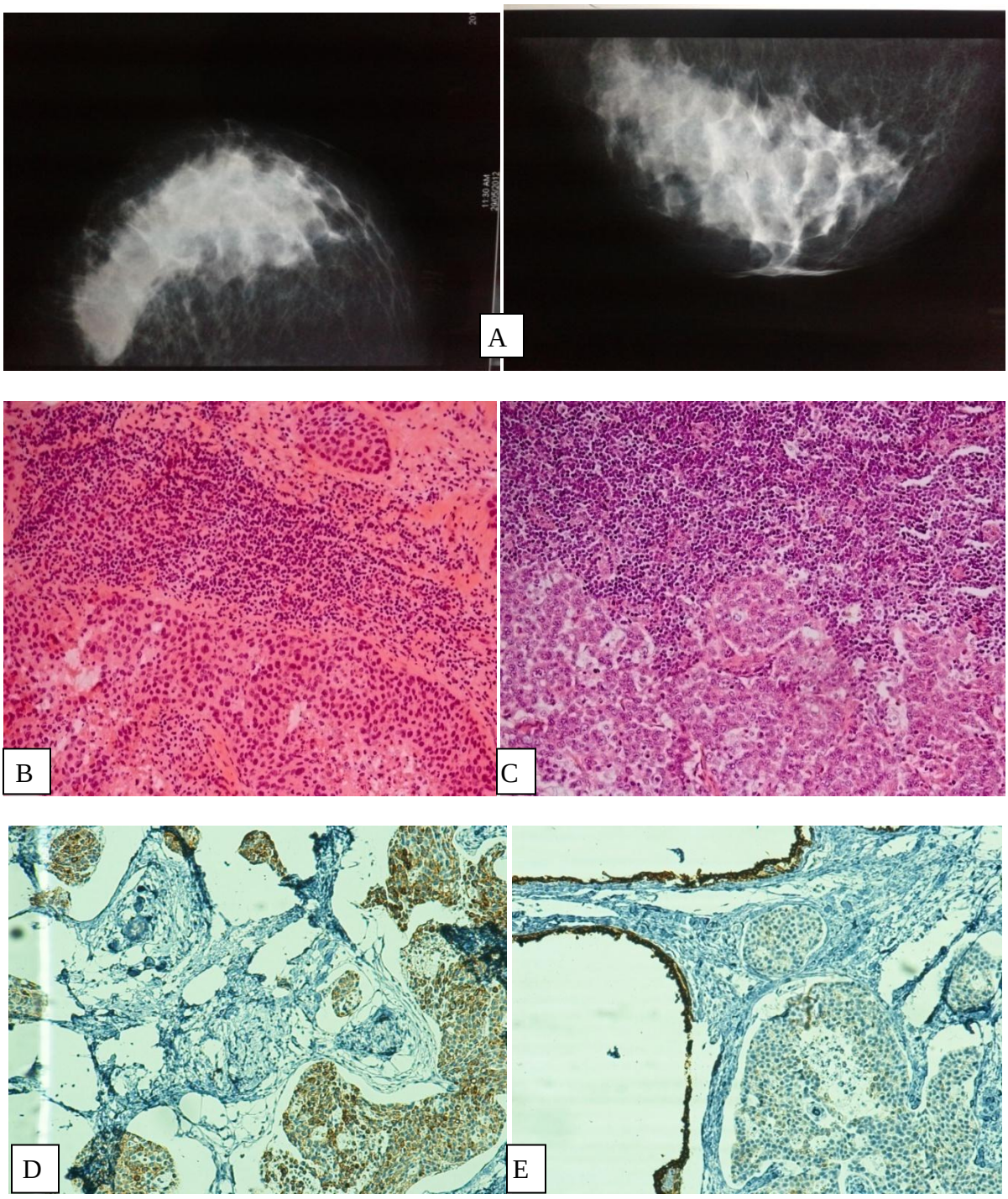

Figure 2: Breast tumor (**A:** mammography **B:** frozen section **C:** lymph node metastasis **D:** CK 20 E:CK 7)

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