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Focus On

Synchronous bilateral invasive breast cancer

Eleni Tousimis

The Breast Center, Weill Medical College of Cornell University, New York, NY, USA.

Abstract Synchronous bilateral invasive breast cancer is a rare event. The etiology of bilateral breast cancer is uncertain, but most evidence supports independent tumors and not metastasis spread from one of the primary tumors. The prognosis of bilateral breast cancer was once thought to be poor, but recent data has suggested a similar survival for bilateral breast cancers as compared to unilateral disease.

Keywords: Bilateral breast cancer; Invasive breast cancer; Synchronous

Introduction

The occurrence of synchronous bilateral invasive breast cancer (SBBC) is an uncommon event. The reported incidence ranges between 0.3% and 12%. This wide range is in part due to the many definitions used to describe the entity of bilateral breast cancer. Some physicians consider a contralateral cancer diagnosed within 1 year as a synchronous bilateral breast cancer. Others narrow the definition of synchronous bilateral breast cancers to those cancers which are diagnosed within 3 months of each other. The following discussion will address the etiology, diagnosis, surgical management, cosmetic outcome and prognosis of patients with synchronous bilateral breast cancer.

Etiology

It is likely that synchronous bilateral tumors are independent tumors rather than secondary to metastatic spread from one of the primary lesions. Characteristics, which imply independent tumors are the presence of an intra-ductal component, different histologies or different degrees of differentiation between the tumors [1]. In a study of the chromosomal abnormalities in patients with bilateral breast cancers, the majority of contralateral tumors arose independently of the primary tumor [2]. Only a minority of the tumors were the result of metastatic spread from the primary tumor. A metastatic mode of spread is supported by the finding of the same clonal abnormalities between the two tumors. An alternate explanation for these similar clonal abnormalities is a single-cell origin or exogenous/endogenous influences affecting both breasts simultaneously. In the largest prospective study to date of 143 patients with SBBC, the strongest correlation of an intra-ductal component between the bilateral breast tumors implies independent tumors and excludes the metastatic origin of these tumors [3].

Diagnosis

Patients with breast cancer have an increased risk of developing either a synchronous or metachronous breast cancer which ranges between 0.5% and 0.8% each year [3]. When patients are diagnosed with SBBC, the tumor which is diagnosed first is usually the larger tumor as compared to the contralateral tumor. The stage of the patient with SBBC is the stage of the higher staged tumor. The initial tumor is usually diagnosed by palpation, whereas, the contralateral tumor is often diagnosed by imaging modalities such as mammography, ultrasonography or magnetic resonance imaging (MRI), however, the most common mode of detection of the contralateral

Correspondence to: Eleni Tousimis, MD, Assistant Professor of Surgery, 425 East 61st Street, 8th floor, New York, NY 10021, USA. E-mail: eat2002@med.cornell.edu; Tel: +1 212 821 0850; Fax: +1 212 821 0824

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tumor is with mammography. This supports the role of careful screening of the contralateral breast and follow-up of all patients diagnosed with breast cancer [4,5]. The most common histologic subtype is infiltrating ductal carcinoma; however, the incidence of invasive lobular carcinoma and the finding of lobular carcinoma *in situ* (LCIS) is slightly higher amongst synchronous bilateral carcinomas as compared to unilateral disease. Histopathologically, several studies have shown that synchronous bilateral breast tumors tend to be of lower histologic grade with a higher rate of estrogen receptor (ER) and progesterone receptor (PgR) positivity [3,6].

Surgical management and cosmesis

Considerable controversy has existed regarding the surgical management of patients with synchronous bilateral breast cancer. Traditionally, most clinicians have approached bilateral breast cancer more aggressively than unilateral disease. Most studies have shown a disproportionately higher incidence of bilateral mastectomy for bilateral breast cancer. This aggressive approach was employed to treat what was once thought to be a disease with a worse prognosis and outcome. However, several studies have shown that the prognosis of patients with bilateral breast cancer seems similar to unilateral disease. Gollamudi *et al.* retrospectively reviewed patients with SBBC and showed that they do not have a worse prognosis and can be safely treated with bilateral breast conservation. The cosmetic outcome was comparable to patients who underwent unilateral breast conservation. Heron *et al*. also demonstrated that bilateral breast conservation treatment does not compromise cosmesis, outcome or overall survival in this group of patients [7]. Currently, the overall consensus is that bilateral breast cancer is amenable to bilateral breast conservation treatment without compromising survival and maintaining patient cosmesis [1].

Survival

Survival data has been difficult to interpret because of different definitions used to describe bilateral breast cancers. For example, calculations of survival from the time of the first and not the second primary can have a significant impact on the reported survival rates [7]. There is also a question of multifocality/multicentricity associated with these tumors affecting local recurrence rates. In a prospective study of SBBC, 18% of the bilateral breast cancer patients had the presence of multifocality on both sides [3]. This incidence of multifocality compares with the reported incidence in many bilateral breast cancer series. Similarly, others have evaluated breast tumors for multicentricity and found that the presence of multicentric tumors was a significant risk factor for bilateral breast cancer. This higher incidence of multifocal/multicentric disease may explain the slightly higher local recurrence seen after breast conserving surgery [8]. Despite this slightly higher local recurrence rate, most evidence supports a similar disease free and overall survival compared to patients with unilateral disease [1,8]. Therefore, the presence of bilateral invasive breast carcinomas have not been clearly shown to exert a negative impact on patient survival.

Conclusion

SBBC is a rare event warranting physician awareness and screening of the contralateral breast in patients with unilateral breast cancer. The etiology of bilateral breast cancer is uncertain, but most evidence supports independent tumors rather than metastatic spread from the primary tumor. The contralateral tumor is usually diagnosed by mammography and is commonly the lower staged tumor. The prognosis of bilateral breast cancer was once thought to be poor, which explained the high rate of bilateral mastectomies. However, recent data has suggested a similar survival for bilateral breast cancers as compared to unilateral disease for patients treated with breast conserving surgery. Furthermore, the cosmesis for bilateral breast conservation has been comparable to unilateral disease. Therefore, bilateral breast conservation may be offered as a viable surgical treatment option for patients with synchronous bilateral breast cancer without compromising outcome.

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