Case Report
Secretory breast cancer in a 7-year-old girl

Nanlin Li*, Meiling Huang*, Yuqing Yang, Rui Ling

Department of Thyroid, Breast and Vascular Surgery, Xijing Hospital, Fourth Military Medical University, Xi’an, Shaanxi, China. *Equal contributors.

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Abstract: Carcinoma of breast is rarely encountered in the juvenile population and no consensus has been reached on the optimal treatment modalities. Here, we present the case of a 7-year-old girl with secretory breast cancer. She had been seen by a surgeon elsewhere who considered the lesion was benign and performed surgical excision of tumor. Presently, considering the indeed young age, the patient was undergone segmental mastectomy, axillary lymphadenectomy and fascia tissue flap forming surgery. As no malignant cells were detected in lymph nodes and BRCA1-2 mutation examination was negative, further adjuvant chemotherapy or radiotherapy was not administered. Four months after operation, the patient remains well and had no evidence of recurrence.

Keywords: Secretory carcinoma, juvenile breast cancer, case report

Introduction
Breast cancer is the leading cancer and the leading cause of mortality among women throughout the world. The American Cancer Society provided an overview of female breast cancer statistics in the United States, indicating approximately 230,480 new cases of invasive breast cancer and 39,520 breast cancer deaths among US women in 2011 [1]. Similarly, the health burden of breast cancer is also increasing in Chinese women, accounting for 12.2% of all newly diagnosed breast cancers worldwide [2, 3]. Recently, breast cancer was most frequently diagnosed among adolescent and young adult (AYA) women. Nearly 1.8% of all breast cancers occur in women younger than 35 years of age [4]. Moreover, the risk of death rises by 5% for every 1-year reduction in age, highlighting the importance of studying breast cancer at an even younger age [5]. However, breast carcinoma is rarely encountered in the juvenile population [6]. Here we intend to report one case of breast cancer in a 7-year old girl to provide more clinical reference for the treatment of juvenile breast cancer.

Case report
A 7-year-old girl was considered primarily as right breast fibroadenoma in the local hospital 3 weeks ago and performed surgical excision of tumor (1.0 cm×1.0 cm). However, postoperative pathology was demonstrated malignant. The patient was admitted to our hospital for further treatment. After investigation, no prior or family history of malignancy was found, as well as radiation exposure. The patient’s development was normal for her age but susceptible to cold, the temperature was up to 39 centigrade degree at first. Physical examination showed a transverse surgical scar close to the papilla on the right breast and healed well (Figure 1). Ultrasound revealed no obvious mass in bilateral breasts, except an enlarged axillary lymph node (1.0 cm in size) on the right and several enlarged cervical lymph nodes on the left, which was considered as reactive hyperplasia. Immunohistochemistry was also performed, revealing negative expression of estrogen receptor (ER), progesterone receptor (PR), human epidermal growth factor receptor-2 (HER-2), ALK, P53 and P63, as well as positive staining of 34BE12 (HCK), CK5/6, E-cadherin, CEA and P120. The proliferation ratio evaluated by Ki-67-MIB1 was estimated as 5% (Figure 2). A diagnosis of secretory breast cancer was then established. Furthermore, a mutational study of 40 susceptibility genes was performed by Anoroad Company (Beijing, China) via direct
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Considering the diagnosis and indeed young age of patient, a segmental mastectomy, axillary lymphadenectomy and fascia tissue flap forming surgery was undergone (Figure 3). The margin was shown clear. Postoperative pathology displayed as granulomatous inflammation and all 16 lymph nodes were free of metastasis. Finally, adjuvant chemotherapy or radiotherapy was not administered. Four months after operation, the patient remains well with good life quality, except for the scar physique (Figure 4). No evidence of recurrence occurred so far.

Discussion

Breast cancer was rarely seen in children. As reported by Murphy JJ et al, there only have 38 cases of primary breast cancer reported in children ranged from 3 to 19 years old before 2000 [7]. Since then, 18 cases of juvenile breast cancer were reported until July 2015, 11 of them was diagnosed as secretory breast cancer while 6 cases as ductal carcinoma, the remaining one case was locally advanced breast cancer [7-24]. These children usually present with a painless, firm, nontender, immobile, poorly circumscribed breast mass. Unfortunately, there is still no consensus of opinion as to how juvenile breast cancer should be treated.

Clinical evaluation is an essential component of complete assessment of pediatric breast complaints. The developing breast is vulnerable to injury, and the diagnostic and management approach emphasizes “first do no harm” [25]. When necessary, ultrasound is the primary imaging modality used, given its diagnostic specificity and lack of ionizing radiation. The cystic appearance secondary to the pseudocapsule may be a marker for secretory adenocarcinoma. Mammography is seldom used, but suitable to visualize the calcifications. Cross-sectional imaging modalities such as CT or MR are usually reserved for disease extent evaluation. Besides, fine-needle aspiration (FNA), routinely used in adults, was evolved in children and may become a useful adjuvant tool. In addition, special attention should be focused on the young people with risk factors predisposing to breast cancer, such as strong family history, known extra-mammary malignancy, genetic mutations, or prior mantle irradiation. Biopsy is often required to exclude malignancy regardless of the imaging appearance of the breast lesion [25]. Moreover, genetic mutations exerted significant function to establish scientific treatment strategy in adult breast cancer, which is not yet determined in children breast cancer, such as estrogen and progesterone receptors, cytogenetics, BRCA1 and 2 [7].

Familial incidence has limited discussion in previously published cases. As reported in 2004, the maternal aunt of a 7.5-year-old boy with secretory breast cancer was operated for breast cancer at the age of 43 [9]. In 2012, a 13-year-old boy with invasive secretory breast cancer (pT1pN1M0) had an uncle with prostate cancer [21]. Meanwhile, an 18-year-old girl with medullary breast carcinoma also has a maternal aunt with breast carcinoma [20]. Yet, no association has been considered to be pure coincidence.

The pediatric breast cancer therapy remains controversial and inconsistent. Surgical treatment has ranged from local excision to radical mastectomy. Axillary node dissections have not been done consistently. In 2012, Tadesse A treated a 7-years-old girl with breast carcinoma by modified radical mastectomy with level II axillary dissection [13]. In 2015, a 6-year-old girl with secretory breast carcinoma was report-
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Figure 2. The histological and immunohistochemical figures of the cancer (40×). A: ER (-); B: PR (-); C: Her2 (-); D: Ki67 (10%-+).

Table 1. The sequencing analysis of 40 susceptibility genes

<table>
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<th>No.</th>
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ed to discuss the use of mastectomy with sentinel lymph node dissection [14]. Even for locally advanced breast cancer, a modified radical mastectomy was considered to be adequate treatment in an 11-year-old prepubertal girl [10]. Besides, breast-conserving therapy was gradually tried by clinicians. In 2014, breast-conserving therapy was carried out in a 12-year-old girl with secretory breast carcinoma [12].

In consideration of no pronounced evidence demonstrates the significant efficacy of chemotherapy and/or radiotherapy, post-operative radiotherapy and/or chemotherapy was always not considered in juvenile breast cancer treatment, even for the metastatic and aggressive cancer. Nevertheless, Cabello C et al applied six cycles of adriamycin and cyclophosphamide to a boy with invasive secretory breast cancer in 2012 [21]. Similarly, four cycles of doxorubicin and cyclophosphamide followed by four cycles of docetaxel chemotherapeutic regimen was added to a 12-year-old girl with secretory breast carcinoma [12]. Moreover, Kim JY group select chemotherapy, in combination with radiotherapy strategy for a 14-year-old girl with
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invasive ductal carcinoma in 2014 [16]. In my opinion, due to the possible secondary effects, such as fibrosis of the lung, rib damage and the consequent asymmetry of the rib cage, as well as a risk for future development of neoplasia, postoperative radiotherapy should not be advised for children. For the juvenile breast cancer patients with good prognosis, we agree with the “wait-and-see” policy presented by Szant J [9]. Further treatment will be given if it becomes necessary with the development of metastases.

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Disclosure of conflict of interest

None.

Address correspondence to: Rui Ling, Department of Thyroid, Breast and Vascular Surgery, Xijing Hospital, Fourth Military Medical University, Xi’an 710032, Shaanxi, China. Tel: 86+84775271; E-mail: lingruiaoxue@126.com

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