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Breast Carcinoma Arising in Fibroadenoma in a 15-Year-Old Girl; Diagnosis and Treatment Challenge

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Abstract

Breast cancer in adolescents occurring in fibroadenomas is extremely rare. We report a case of right breast cancer in a 15-year-old female student diagnosed in 2020. This is the youngest reported case of breast cancer arising within fibroadenomas in the literature. The teenager has no personal or family history of cancer or known hereditary disease. Currently, there is no consensus on the management of breast cancer arising from adenofibromas in adolescents. Clinically, the tumor was inflammatory with axillary lymph node involvement (T4dN1M0). The fine-needle aspiration cytologic was suspicious of malignancy. The patient received four courses of neoadjuvant chemotherapy with 5-fluorouracil®, doxorubicin® and cyclosphosphamide®, followed by radical right mastectomy. The histological result of the surgical specimen is a non-specific carcinoma with a therapeutic effect greater than fifty percent. The patient received three courses of adjuvant chemotherapy with paclitaxel®. The adolescent underwent radiation therapy at her chest wall of 50 Gy and regional lymph node of 46 Gy. After radiotherapy, hormone therapy with Tamoxifene® at 20 mg per day was started. At 16 months from radiotherapy, there is no recurrence. The reconstruction of the right breast is planned in a few months.

Keywords

Adolescent, Breast Carcinoma, Fibroadenoma, Mastectomy

1. Introduction

The majority of breast swellings in adolescents are benign including adenofibro-

mas, cysts and abscesses. Only 0.02% of findings of surgically removed pediatric breasts are malignant [1]. Breast cancer arising within fibroadenomas (Bcafad) is a very rare finding [2]. The average age of patients with Bcafad is in the fifties. A case of Bcafad in an 18-year-old girl was recently reported [3]. To our knowledge, we report the first case occurring in a 15-year-old girl in the literature. Currently, there is no consensus on the principle of management of breast cancer occurring in adenofibromas. In reporting this case, we emphasise that the evolution of a complex adenofibroma of the breast in an adolescent girl should be followed closely, even in the absence of a family history of cancer. The multidisciplinarity is essential for the management of these rare.

2. Case Report

A 15-year-old adolescent, non-drinking and smoking, nulliparous with no history of family cancer or genetic disease, came for a gynecological consultation in September 2019 for a right peri-nipple nodule evolving for 1 year previously and gradually increasing in volume. A breast ultrasound showed a tissue-cystic mass with internal microcalcifications occupying all the outer quadrants of the right breast measuring 83 × 60 × 5 mm in dimensions. The fine-needle aspiration cytologic had an aspect in favor of an adenofibroma with foci of atypical hyperplasia for which excision of the nodule was recommended. The patient subsequently underwent nodulectomy in March 2020. The pathological result confirmed the presence of a fibroadenoma with non-atypical epithelial hyperplasia, without malignancy. Three months later, there was a local recurrence of the swelling with a rapid increase in volume. The patient presented in consultation with an inflammation of the right breast. The fine-needle aspiration cytologic was suspicious of malignancy. Figure 1 shows a 128 × 104 × 89 mm right breast tumor with ipsilateral axillary lymphadenopathy on chest CT scan. The abdominal and pelvic CT scan was normal. the disease is classified as T4dN1M0 according to

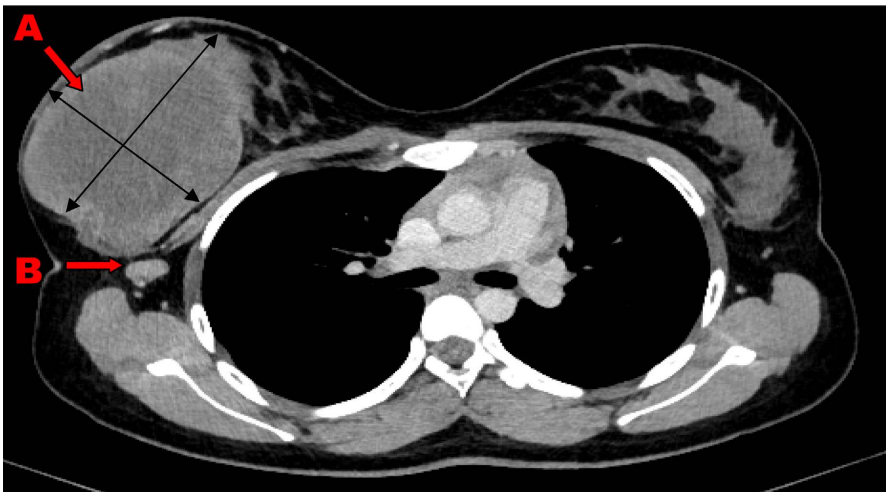

Figure 1. Axial section of a chest CT scan, injected, showing a right breast mass 128 × 104 × 89 mm (A), associated with ipsilateral axillary lymphadenopathy (B).

the classification AJCC (American joint committee on cancer) 8th edition 2017. The Cancer Antigen 15.3 assay was normal. The file was discussed during a multidisciplinary consultation meeting; the decision is submitted and explained to the patient and his parents. The patient received four courses of neoadjuvant chemotherapy with 5-Fluorouracil® 500 mg/m^2, Adriblastine® 50 mg/m^2 and Cyclophosphamide® 500 mg/m^2 followed by radical right mastectomy. The histological result of the surgical specimen is a non-specific carcinoma (Figure 2), with a therapeutic effect greater than fifty percent according to the Sataloff classification. All three lymph nodes identified were free of neoplasm. The peritumoral emboli are not identified. Immunohistochemistry was not performed due to limited financial resources.

Three courses of adjuvant chemotherapy with paclitaxel® 175 mg/m^2 type were carried out; all were well tolerated overall. The patient underwent radiation therapy at her chest wall of 50 Gy in 25 fractions and regional lymph node of 46 Gy in 23 fractions. After radiotherapy, hormone therapy with Tamoxifen®, at a dose of 20 mg per day has been started. At 16 months of radiotherapy, there is no recurrence (Figure 3). The reconstruction of the right breast is planned in a few months.

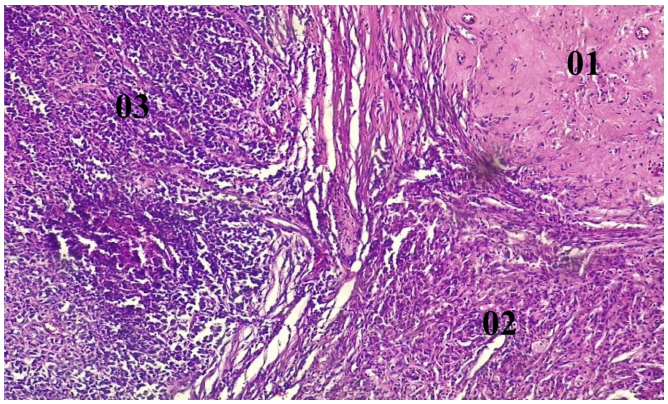

Figure 2. Right mastectomy specimen. Non-specific carcinoma with post-therapeutic changes 01: post-therapeutic fibrosis, 02: macrophage granuloma, 03: tumor cells. Staining: Hematein-eosin, Magnification: ×40.

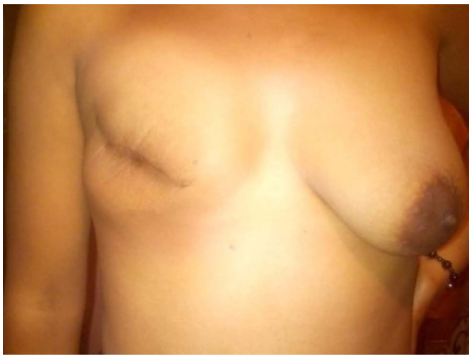

Figure 3. Image post right mastectomy in June 2022.

3. Discussion

Juvenile fibroadenoma represents 30% to 50% of breast masses in adolescents [4]. The risk of transformation into a malignant tumor is rare. The risk of developing cancer is 3.10 times higher in patients with complex adenofibroma versus 1.86 times in patients with non-complex fibroadenoma [5]. The incidence of Bcafad is 0.002% to 0.125% in fibroadenoma specimens. According to the literature, breast cancer in young people under 30 is linked in approximately 50% of cases to germline mutations such as (BReast CAncer gene 1) BRCA1, BRCA2 or TP53 and to a family history of cancer [6]. Our patient had no family history of cancer. Madagascar does not have a molecular biology laboratory that can detect genetic mutations. Radiation therapy to the chest wall is a major risk factor for breast cancer in young subjects.

In our case, the teenager has no personal history of cancer or prior chest irradiation. Lifestyle and environmental factors generally only impact the development of malignancy after decades of exposure [7]. Breast ultrasound is recommended for dense breasts in the pediatric population and to limit it to ionizing radiation [8]. Histological examination should be performed to confirm the diagnosis. Surgical excision is suggested for masses measuring more than 50 mm or rapidly growing [9]. In the present case, the size of the lesion was 128 × 104 × 89 mm. The major histological type of Bcafad was carcinoma in situ (80%). Of the 15% invasive carcinomas, 11% are invasive ductal carcinomas and 3.4% are invasive lobular carcinomas [2]. Obtaining histological proof is difficult in our case. The fine-needle aspiration and excisional biopsy carried out were in favor of an adenofibroma. A second fine-needle aspiration was carried out 3 months after the tumor excision was in favor of a malignant lesion. The histological result of the right mastectomy revealed a non-specific invasive carcinoma. Unfortunately, immunohistochemistry was not performed due to limited financial resources. The incidence of Bcafad positive for hormone receptors was 68.8% (Estrogen Receptor positive) ER+ and 62.5% (Progesterone Receptor Positive) PR+ of cases [2]. (Human Epidermal growth factor Receptor 2) HER2-status is negative in most cases [10]. Our patient had homolateral axillary lymph node involvement, corroborating with the literature data, the majority of young breast cancers are diagnosed at an advanced stage [11].

Currently, the number of cases reported in the literature is not sufficient to draw conclusions on treatment decisions. Management depends on the stage of the disease, but also changes in body image, sexual functioning and the risk of infertility must be taken into account [12] [13]. Oliver Frisch reported a case of Bcafad in an 18-year-old girl with carcinoma in situ whose treatment was surgery alone [3]. Our patient received neoadjuvant chemotherapy with 5-Fluorouracil, Adribalstine and Cyclophosphamide followed by mastectomy and lymph node dissection. Since the anatomopathological result of the surgical specimen did not show a total therapeutic effect and there are only three nodes identified. Adjuvant chemotherapy with Paclitaxel three courses, followed by radiotherapy at her

chest wall and lymph node areas was performed. The postoperative irradiation reduces local recurrences. Hormone therapy with Tamoxifen was initiated at the end of radiotherapy. The prognosis of Bcafad depends on the grade and stage at the time of diagnosis [14]. The breast cancer survival in pediatrics is worse than in adults [15]. Currently our patient is 16 months after radiotherapy and there is no tumour recurrence.

4. Conclusion

Breast cancer occurring in an adenofibroma could present in adolescents. A patient presenting with adenofibroma complex should be closely observed given the risk of transformation or association with cancer. The management of breast cancer in adolescents depends on several factors including the stage of the disease, the consequences of the treatments and the financial resources of the parents.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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