

# Breast Preservation in Women With Giant Juvenile Fibroadenoma

Dana Matz,<sup>1,2</sup> Lauren Kerivan,<sup>1,2</sup> Michael Reintgen,<sup>1,2</sup> Kurt Akman,<sup>1,2</sup>  
Alyson Lozicki,<sup>1,2</sup> Tully Causey,<sup>1,2</sup> Corinne Clynes,<sup>1,2</sup> Rosemary Giuliano,<sup>1,2</sup>  
Geza Acs,<sup>1,2</sup> John Cox,<sup>1,2</sup> Charles Cox,<sup>1,2</sup> Douglas Reintgen<sup>1,2</sup>

## Clinical Practice Points

- Fibroadenoma is a benign tumor of the breast that can occur in young patients. The solid masses may reach large sizes and distort the breast.
- Excision is the most common treatment when the cosmetic appearance is a concern.
- This report details the surgical approach to this clinical problem with functional preservation of the breast and a good cosmetic result.

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## Introduction

Fibroadenomas are defined as benign breast lesions, usually formed during menarche (15-25 years of age), that can exist as a solitary mass or multiple masses in the breasts of women.<sup>1</sup> In development, as lobular structures are added to the breast's ductal system, hyperplastic lobules are often present. Although lobules are associated with normal growth, analysis of the cellular components link hyperplastic lesions to fibroadenomas.<sup>1</sup> Fibroadenomas that measure >5 cm are commonly classified as giant fibroadenomas. When these enlarged masses are found in young female patients, they are often called juvenile fibroadenomas. The lesions are rare, accounting for only 0.5% of the total diagnosed fibroadenomas, and can grow to large sizes and cause prominent asymmetry of the breasts.<sup>2</sup> Other structural changes include both stretching of the areola complex and distortion of the dermal tissue.

Clinicians are confronted with treatment decisions on whether to manage these rare cases by way of continued routine examinations or to surgically remove the fibroadenomas. Cosmesis and lactation preservation are the main concerns in this population because malignancy is rare in this age group. Malignancy is of lesser concern with giant fibroadenomas due to their more cellular and less lobular his-

tology.<sup>1</sup> Other considerations for the surgeon are that some fibroadenomas will show spontaneous regression. In this challenging case, surgery was deemed appropriate after the definitive diagnosis was made due to the distortion of the breast with the massive volume of multiple lesions.

## Case Report

A 13-year-old African American girl presented with the chief symptom of "her right breast being larger than her left breast" and being able to palpate a number of breast masses. She otherwise was healthy, with no previous operations, medical conditions, or allergies, and was taking no medicines. The right breast was described as having a "heaviness" to it associated with a dull ache. On physical examination, the patient had a right breast that was approximately twice the size of the left breast, with multiple palpable masses (Figure 1). The masses were movable, soft, and well defined. An incisional biopsy was planned to make the definitive diagnosis, with the differential diagnosis being pseudoangiomatous stromal hyperplasia, phyllodes tumor, or giant juvenile adenoma in this age group. The patient was taken to surgery for an incisional biopsy of one of the large masses, with frozen section pathology returning a result of fibroadenoma. Incisional biopsy was deemed necessary so that adequate tissue would be obtained in this mostly fibrous lesion. A resection of what was presumed to be 3 fibroadenomas with breast preservation and minimal cosmetic alteration was performed. The breast masses were approached through a submammary incision with the initial dissection lifting the skin and/or areolar-nipple envelope and preserving a core of ductal-nipple tissue with a preserved pedicle of tissue.

<sup>1</sup>Department of Surgery, University of South Florida, Tampa, FL

<sup>2</sup>The Surgical Institute, Florida Hospital North Pinellas, the Breast Center, Florida Hospital, Tampa, FL

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Address for correspondence: Douglas Reintgen, MD, Surgical Institute, Florida Hospital, North Pinellas, 1501 Alternate 19 South, Tarpon Springs, FL 34689  
E-mail contact: dreintge@health.usf.edu

**Figure 1** Preoperative Photograph of a Patient With a Number of Large Right Breast Masses Causing Significant Asymmetry to the Breasts



**Figure 2** Gross Pathology Specimen of the Five Large Juvenile Fibroadenomas Removed Through the Inframammary Incision



**Figure 3** Photomicrograph, Showing the Bland Appearance of Ductal and Stromal Elements of the Juvenile Fibroadenoma (Hematoxylin and Eosin, original magnification  $\times 10$ )



**Figure 4** Postoperative Photograph of the Patient, Showing Breast Preservation With an Excellent Cosmetic Outcome



histology of a juvenile fibroadenoma was confirmed (Figure 3). The patient returned to the clinic in 1 month with a good cosmetic result (Figure 4).

The incision was similar to the one used in the nipple-skin sparing mastectomy operation by using the 7-cm by 11-cm rule. With this technique, the incision starts 7 cm from the sternal junction in the inframammary fold and extends 11 cm toward the axilla. Although initially there only seemed to be 3 lesions, intraoperatively a total of 5 masses were encountered, dissected free from surrounding tissue, and submitted to pathology. The largest mass measured 10 cm and was located at the areolar-cutaneous junction, at 9:00 am. Two of the masses measured 7 cm, and another mass measured 5 cm at the 6:00 am location (Figure 2). The specimen was submitted to pathology, and the frozen section

## Discussion

Breast masses in young patients are usually benign in nature but may cause considerable concern due to pain and cosmesis of the breast. Girls who are maturing and entering the reproductive stage of their lives may encounter breast masses that cause an asymmetry in the size and shape of one breast compared with the other. This size difference may be the result of benign breast masses, such as fibroadenomas, in young patients. A fibroadenoma is a solid, benign tumor that affects young women under the age of 30 years.<sup>2</sup> They frequently occur in African American adolescent girls.<sup>3</sup>

The exact cause of a fibroadenoma is unknown, but it is speculated that reproductive hormones may be the etiologic agent because most cases of fibroadenoma arise in the reproductive years of life. These lesions also tend to grow and become larger during pregnancy, and they may decrease in size after a woman reaches menopause, due to a decrease in estrogen stimulation.<sup>2</sup>

Fibroadenomas may be detected initially during an annual breast examination by physicians or, more often, are detected by the patient with breast self-examination. Breast masses that are new, painful, or that increase in size may cause concern. A family history of breast cancer, particularly a family that carries a genetic predisposition in which breast cancer may develop at a younger age is also a consideration, albeit rarer in this age population.

Most commonly, the initial chief symptom is an enlarging breast that causes very noticeable asymmetry by a simple, palpable mass. The average age at diagnosis is 15 to 17 years.<sup>3</sup> On physical examination, these masses may feel like a marble with rounded borders being mobile but hard.<sup>2</sup> The general location of a fibroadenoma is most often within the upper outer quadrant where the majority of the breast tissue is located even in this younger age group. A small percentage (approximately 10%-25%) of patients will have not just one mass but multiple masses, and they may occur bilaterally.<sup>1</sup> The size of typical fibroadenoma ranges from 1 to 2 cm. Occasionally, giant fibroadenomas, defined as >5 cm in size, develop in this population and cause a significant problem for the patient. In a case of juvenile fibroadenoma, the mass can grow quickly to >5 cm.<sup>2</sup> This report details a patient with multiple fibroadenomas, which range from 5 to 10 cm and cause significant discomfort, deformity of the breast, and concern for the patient.

Breast imaging with mammography, computed tomographies, and magnetic resonance imaging will certainly visualize the uniform lesions, but, in this age group, breast ultrasound is the usual modality of choice due to radiation concerns. On ultrasound, the fibroadenomas are seen as smooth, rounded, solid densities. A breast ultrasound and fine needle aspiration or core biopsy can provide a definitive diagnosis in most situations.<sup>3</sup> Ultrasound characteristics include an oval-shaped mass with an internal echo pattern that is homogenous with no enhancement within the mass. A fine acoustic shadow will indicate the boundary of the benign mass, which is usually well defined and very easily separated from surrounding breast tissue. In some cases, there will be a deviation in this typical appearance. Fibroadenomas may be lobulated or cast an acoustic shadow, which is extremely rare. Most likely, the physician at this point will have made a clinical diagnosis of a fibroadenoma, but a needle biopsy is recommended for tissue confirmation.<sup>4</sup> If adequate cellular material is obtained, then fine needle aspiration or core needle biopsy is useful for diagnostic purposes.<sup>5</sup> A fine needle aspiration is used more often in cases in which a cyst is suspected and dependable cytology is available.<sup>6</sup> For solid lesions such as a fibroadenoma, a core needle biopsy is more appropriate, can yield more tissue to be examined, and is a way to avoid surgical biopsy.<sup>7</sup> If this proves inadequate, then an incisional biopsy may be performed. In most cases, patients can be observed and followed up, especially if the physician has a definitive diagnosis of a fibroadenoma and not cancer. At

times, treatment may not be necessary, but most patients choose to undergo surgery for removal of the fibroadenoma for peace of mind and for body image.<sup>2</sup>

Patients may elect to be followed up. Anesthesia and surgery can be costly and may not be a permanent means to an end because it is possible that, after removal of a fibroadenoma, new lesions may develop. Another reason to avoid surgery is scarring of the breast and cosmesis. Spontaneous regression may also be a consideration in this decision.<sup>2</sup>

Most young patients who have juvenile fibroadenoma choose to undergo surgery due to the fact that fibroadenomas tend to grow in size very rapidly during adolescence. Newer techniques have been proposed for smaller fibroadenomas, such as percutaneous excision or in situ cryoablation, which are less invasive. The 2 newer approaches are probably more appropriate options for older patients with smaller fibroadenomas. Ultrasound-guided percutaneous excision is a safe and effective approach for smaller lesions, with cost savings compared with surgical excision. The recovery is faster, the cosmetic result is favorable, and patients can return to work sooner than they could after surgery. The breasts will retain more of the natural look and contour because incisions are minimal. The second technology of cryoablation is a low-risk technique, which should be performed by a physician who is skilled in breast ultrasound. During cryoablation, a probe will be placed in the center of the fibroadenoma, with the guidance of ultrasound and the lesion is then frozen through this probe.<sup>8</sup> Observation after a biopsy that confirms the mass to be a fibroadenoma should be performed because the potential of a fibroadenoma that evolves into a malignancy is very low.<sup>8</sup> Most young patients and their families would most likely choose surgery for peace of mind and remove what could be a nuisance even though there is very little concern of a more serious problem. The surgery will give the young patient a better body image and perhaps more self-confidence. A patient with fibroadenoma has many options to choose from and should make an appropriate decision based on her lifestyle.

The macroscopic appearance of a fibroadenoma is described as a round well-defined mass. The edges are well demarcated from the surrounding normal breast tissue. The age of the lesion determines the texture of the sample. On gross sectioning, the lesions are light in color, usually white or yellow, and may look lobulated. Some fibroadenomas can also have observable ductal clefts.<sup>4</sup> On histologic examination, there are 2 main types of fibroadenoma, intracanalicular or pericanalicular. The histologic type is determined by the proportion and relationship between the epithelium and the stroma. In most fibroadenomas, both tissue types are present. If a specimen has more stromal proliferation, with the ducts being compressed, then the fibroadenoma is labeled as intracanalicular. The ducts will not have the normal appearance and will appear slit-like. A mass that has ducts that have remained rounded and normal with a proliferation of fibrous stroma around the ductal spaces is identified as a pericanalicular fibroadenoma.<sup>9</sup>

Certain fibroadenomas may increase the risk of developing breast cancer. Simple fibroadenomas that microscopically appear bland and uniform do not increase one's risk but more complex fibroadenomas composed of macrocysts, sclerosing adenosis, calcifications, or apo-

crine changes do increase a patient's risk of breast cancer. The risk is approximately 1.5 to 2 times greater than in a person who has had no history of these types of fibroadenoma.<sup>10</sup>

The case report illustrates a young patient who presented with a distorted right breast due to five large masses that, on biopsy, proved to be juvenile fibroadenomas. Surgical options for breast preservation were explored, keeping in mind cosmesis and preserving the ability to lactate. An inframammary approach was used similar to a nipple sparing mastectomy incision and the nipple-areolar complex was preserved on a tissue-vascular pedicle. When confronted with large breast masses in adolescence, clinicians should be aware that the breast can be preserved with excellent cosmesis and retention of function.

## Disclosure

The authors have stated that they have no conflicts of interest.

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