Benign Tumors of the Teenage Breast

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Learning Objectives: After studying this article, the participant should be able to: 1. Describe how to differentially diagnose tumors in the breasts of adolescent girls. 2. Compare and contrast the surgical options for the management of adolescent breast tumors. 3. Discuss with general surgeons the reconstructive options for the management of adolescent breast tumors.

First launched in 1997, the PSEF has continued to expand its computer-based educational opportunities through its “Visiting Professor Online Conference.” The most recent live broadcast featured PSEF Senior Visiting Professor Dr. Mary H. McGrath discussing and answering questions about “Benign Tumors of the Teenage Breast.” For detailed information about how to participate in the next interactive online communication, call the ASPRS/PSEF Executive Office at (800) 766-4955 (press 7) or (847) 228-9900, ext. 470; or e-mail memserv@plasticsurgery.org. (Plast. Reconstr. Surg. 105: 218, 2000.)

Dr. McGrath (Online): Welcome to our discussion of benign tumors arising in the breast of adolescent girls.

The patient is a 17-year-old girl presenting with a 1-year history of sudden, rapid, asymmetric enlargement of her breast. Physical examination showed a 20-cm mass apparently occupying the entire breast with ptosis, marked nipple-areola stretching, prominent dilated veins, and skin ulceration superolateral to the nipple (Fig. 1). A family physician had obtained mammograms and sonograms, which showed a dense, circumscribed, homogeneous mass occupying the entire breast.

The differential diagnosis of a large breast lesion in the adolescent female includes giant fibroadenoma, phyllodes tumor, and virginal hypertrophy. Fibroadenoma is the most common breast neoplasm in the adolescent, and giant fibroadenoma is characterized by size greater than 5.0 cm in diameter, presentation at or soon after puberty, and short doubling time. The lesion is usually solitary, firm, non-tender, and presents as a rapid asymmetric breast enlargement with prominent veins over the tumor and occasional skin ulceration due to pressure (Table I).

From a pathologic standpoint, a wide spectrum of changes in both epithelial and connective tissue components can be found in these tumors, but cellular atypia is not a feature.1,2

**Differential Diagnosis**

Phyllodes tumors are large, benign tumors that occur primarily in the perimenopausal patient. They are histologically distinct from giant fibroadenomas, and atypical changes in these tumors are rare in the adolescent.3

Juvenile breast hypertrophy can be unilateral or bilateral and is a diffuse enlargement of the breast without any nodularity or presence of a discrete mass. Treatment for breast hypertrophy is reduction mammoplasty.

**Question:** How large was the mass in this patient?

The mass was 20 cm, oval, and well circumscribed to palpation. It had developed over 1 year.
Question: Is needle biopsy an appropriate first step to diagnosis?
Fine-needle aspiration for cytopathology is appropriate.

MANAGEMENT

Giant fibroadenomas are benign lesions that can be excised by enucleation with minimal risk of local recurrence. Mastectomy is not necessary for these lesions and no adjuvant treatment is indicated (Table II).

Current general surgery textbooks describe excision through an inframammary incision and state that reconstructive procedures with “flap rotation and prosthesis are inappropriate” because the “breast remnant generally returns to a normal configuration and contour following removal of the fibroadenoma.”

Although I agree with this recommendation for smaller juvenile fibroadenomas, the distortion and asymmetric stretching and attenuation that occur with the larger lesions call for a breast reconstruction technique to achieve symmetry.

Several plastic surgeons have addressed cases of the adolescent breast with a giant benign tumor. These case reports have described widely different approaches: dermal flaps with free nipple graft and breast implant, intraoperative determination and resection of excess skin with nipple elevation, and simple mastectomy with a tissue expander and free nipple graft.

Question: This was not juvenile hypertrophy, because there is a discrete mass. How do you know it is not a cystosarcoma phyllodes?

In this case, the fine needle aspiration makes the diagnosis of fibroadenoma certain. But we are also helped by the history. Phyllodes tumors occur primarily in the perimenopausal era. They are far less common than fibroadenomas, occurring approximately one-fortieth as frequently.

Incidently, histologists today prefer the term phyllodes tumor and have abandoned the words “cystosarcoma phyllodes” inasmuch as these tumors are neither cystic nor sarcomatous.

OPERATIVE PRINCIPLES

A modification of the McKissock vertical bipedicled mammoplasty was used for excision and reconstruction of the breast with giant fibroadenoma, which enabled three conditions to be met:

1. Minimal flap dissection to maintain normal breast and nipple attachments in whatever site they lie
2. Avoiding the use of an implant
3. A way to plan preoperatively for skin ex-

<p>| TABLE I |</p>
<table>
<thead>
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<th>Giant Fibroadenoma</th>
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<tr>
<td>• 13–20 years of age</td>
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<tr>
<td>• Larger than 5–10 cm</td>
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<td>• Sudden rapid growth</td>
</tr>
<tr>
<td>• Unilateral</td>
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<td>• Large dilated veins</td>
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<p>| TABLE II |</p>
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<th>Giant Fibroadenoma Treatment</th>
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<tr>
<td>• Enucleation</td>
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<tr>
<td>• Preservation</td>
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<tr>
<td>• Omit implant</td>
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<td>• Preoperative planning</td>
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cision and nipple placement before the tumor is resected and the stretched skin becomes massively redundant.

In this modification, the distance from the areola to the inframammary fold was shortened, the nipple site was set lower than 22 cm to allow for retraction of the massively stretched skin, and no resection of any parenchyma was needed when enucleating the tumor (Fig. 2).

*Question: Does the massively stretched skin really retract or shrink?*

In my experience, it does shrink to some extent, but this is unpredictable. This is the reason the distance from the areola to the inframammary fold was shortened to 4.0 cm or even less. And, having noted that the skin on the upper quadrants seems to shrink more than that on the lower part of the breast, I have brought the nipple site down to 25 to 24 cm from the sternal notch. This heads off problems with later upward displacement of the nipple areolar complex, which is almost impossible to correct when it occurs. Also, it was noticed that the nipple and areola tend to retract dramatically on these breasts, so the diameter of the areolar tissue left on the bipedicle was increased relative to the size of the areola on the opposite breast.

After excision of skin medially and laterally, the tumor is removed before further development of the bipedicle to any avoid any unnecessary dissection (Fig. 3). It is important to preserve all of the normal parenchyma. I think this is the way to avoid having to use an implant.

*Question: Do you feel that using an inferior pedicle does not allow you to meet the three goals you stated earlier?*

I do not think there is as much flexibility with an inferior pedicle. This is because one cannot be sure that the bulk of the remaining parenchyma will lie inferiorly. With the bipedicle, one can maneuver no matter where the bulk of the displaced tissue lies.

*Question: Is there any justification for basing the pedicle wherever the tumor is not present (that is, if it lies in the upper quadrant, use an inferior pedicle, and so forth)?*

It is very difficult with the giant tumors to localize them reliably. With smaller fibroadenomas, the inferior pedicle could be used because most of these tumors occur in the upper outer quadrant.

The tumor shelled out easily. The lesion was a 1550-g mass of well-encapsulated lobulated fibrous tissue. Histologic examination showed juvenile hypertrophy and pericanalicular fibroadenoma (Fig. 4).
RESULTS

Early postoperatively, the breasts were nearly symmetrical with good projection. At 2 years, the breast size is symmetrical, but the treated breast is somewhat rounder and the nipple-areola complex is a little too high on the breast mound (Fig. 5).

In subsequent cases, the distance from the areola to the inframammary fold was shortened even further, leading to my suggestion that the distance can be even less than 4.0 cm. Also, note that the diameter of the areola is slightly less than on the left breast. Subsequent to this case, I have left more than a 5.0-cm diameter, which has helped with this problem.

DISCUSSION

It is important for us as plastic surgeons to point out to our general surgery colleagues that a reconstructive operation is necessary. As mentioned before, the general surgery textbooks contain the statement that reconstructive procedures are “inappropriate.” Their point is that the breast remnant can be expected to return to a normal contour after removal of the tumor. However, although this is true for small tumors, it certainly is not the case with the giant lesions.

Question: Now I understand why you set the nipple at 22.0 or more cm from the sternal notch with a less than 4.0-cm areola-to-inframammary fold distance. Are these breasts more susceptible to, and do they undergo a greater degree of, bottoming out than the usual breast reduction?

I think that they do, and this gets back to the question asked earlier. The very attenuated skin with the giant lesions is not predictable; it certainly does not retract reliably and consistently over all parts of the breast.

Question: How much do you think skin contributes to bottoming out, versus Cooper’s ligaments and deeper structures?

I cannot answer your question. The normal breast tissue can be so displaced in some of these breasts that it is probable that the ligaments and deeper structures are altered also. Probably, both the skin and the parenchymal displacement play roles.

Question: Have you seen any patients treated by general surgeons for whom immediate reconstruction wasn’t done? What did you have to do?

Yes. In two cases, I found that they had removed a great deal of the normal breast tissue. In these patients, not only did the skin envelope have to be adjusted, but a breast implant was also needed.

Comment: I do not know about anyone else, but this has been an eye-opener for me. Before, I would reflexively refer all breast tumors to a general surgeon.

Fig. 4. The 1550-g well-encapsulated fibroadenoma.

Fig. 5. Postoperative views 2 years after surgery.
I think for these tumors we can do a better job, but I do have my patients see a general surgeon and we keep them posted about what we are doing. As a result, the general surgeons now refer most of these patients to us directly.

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REFERENCES

Self-Assessment Examination follows on page 223.
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1. WHICH OF THE FOLLOWING IS A CONSISTENT FEATURE OF JUVENILE GIANT FIBROADENOMA?
   A) Multifocal location
   B) Well-encapsulated
   C) Marked atypia
   D) Local recurrence
   E) Malignant degeneration

2. THE MOST USEFUL DIAGNOSTIC TEST FOR EVALUATION OF BREAST MASSES IN THE ADOLESCENT IS
   A) Mammography
   B) Ultrasonography
   C) Magnetic resonance imaging
   D) Cytology
   E) Thermography

3. THE MOST COMMON CAUSE OF UNILATERAL BREAST ENLARGEMENT IN AN ADOLESCENT IS
   A) Virginal hypertrophy
   B) Giant fibroadenoma
   C) Phyllodes tumor
   D) Breast malignancy

4. MANAGEMENT OF A GIANT BREAST TUMOR IN THE ADOLESCENT IS
   A) Hormone therapy
   B) Enucleation
   C) Lumpectomy
   D) Subcutaneous mastectomy
   E) Simple mastectomy

5. THE MAJOR TECHNICAL PROBLEM FOR THE PLASTIC SURGEON TREATING GIANT FIBROADENOMA IN
   THE ADOLESCENT IS
   A) Nipple-areolar loss
   B) Inadequate normal breast parenchyma
   C) Redundant skin
   D) Poorly defined inframammary fold
   E) Skin necrosis

To complete the examination for CME credit, turn to page 484 for instructions and the response form.