CASE REPORT

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Oncoplastic Approach to Juvenile Giant Fibroadenoma: A Case Series

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ABSTRACT

Juvenile giant fibroadenoma (GFA) is defined as a benign tumor larger than 5 cm, 500 grams, and/or involving at least 80% of the breast. It typically occurs in young patients and causes breast deformity and asymmetry. Surgical treatment involves resection of the tumor (enucleation), rearrangement of the skin envelope, and repositioning of the nipple-areola complex. However, the expected re-expansion of the breast following tumor removal, often managed through periareolar approaches, can be unpredictable and prolonged in certain cases. For this reason, oncoplastic surgery techniques have been developed, which allow for immediate partial reconstruction and are now among the available therapeutic options. This report describes three cases in which an oncoplastic approach was used for the treatment of GFA.

Keywords: Oncoplastic surgery; giant fibroadenoma; juvenile fibroadenoma; mammoplasty

KEY POINTS

- Juvenile giant fibroadenoma is a benign breast tumor >5 cm or >500 g, often causing deformity and asymmetry in young patients.
- Treatment involves tumor removal and breast reconstruction.
- Oncoplastic surgery allows immediate partial reconstruction with better cosmetic outcomes.
- Surgical approach depends on tumor size, asymmetry, and ptosis.

Introduction

Juvenile giant fibroadenoma (GFA) is defined as a lesion larger than 5 cm, 500 grams, or one that replaces at least 80% of the breast. It occurs in patients aged 9 to 25 years, with a prevalence of 2.2% in this age group (1). Accelerated growth is associated with increased levels of estrogen, progesterone, and prolactin (2), which leads to breast asymmetry and deformity. Surgical treatment is required; however, there is no consensus on the optimal surgical approach. Oncoplastic surgery techniques aim to allow for enucleation, remodeling of the skin envelope, preservation of breast tissue, and repositioning of the nipple-

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areola complex in cases of marked asymmetry (3). We present three cases treated with an oncoplastic approach in a hospital in Latin America.

Case Presentations

Case 1

A 12-year-old patient reported progressively growing palpable bilateral breast masses over the past year. On physical examination, multiple well-defined, mobile tumors were palpated in both the left and right breasts, without skin involvement. The largest tumor was located in the upper inner quadrant of the left breast, measuring 5.5 cm (Figure 1A). Breast ultrasound showed, in the left breast: ovoid, hypoechoic, heterogeneous lesions with circumscribed margins, parallel to the skin axis, located at: clock positions (r) 11, 12, and 1 (46x19 mm), r3 (15x8.6 mm and 11x6.6 mm), r6-r7 (51x12 mm); and in the right breast at r11-r12 (36.7x22.2x39.5 mm), r1-r2 (12x10 mm and 25x12 mm), r6 (20x12 mm and 15x10 mm), r8-9 (44x22.5 mm), suggestive of bilateral GFA, Breast Imaging Reporting and Data System (BIRADS 3).

Core needle biopsies were performed on the largest lesions in both breasts, showing fibroepithelial neoplasms with moderate stromal cellularity and mild atypia, suggestive of fibroadenomas. Two oncoplastic treatment options were considered: crescent mammoplasty and inframammary fold approach (inferolateral incision), with the latter performed.

The pathology report confirmed fibroadenoma in both breasts, with the largest surgical specimen measuring 6.2 cm in the left breast and 4.9 cm in the right. The patient had a favorable postoperative outcome with no asymmetry observed at the 12-month follow-up (Figure 1B).

Case 2

A 15-year-old patient presented with a progressively growing mass for the past two years in the right breast. Upon examination, there was a well-defined, multilobulated, mobile tumor in the right breast affecting all four quadrants and causing grade 3 ptosis,

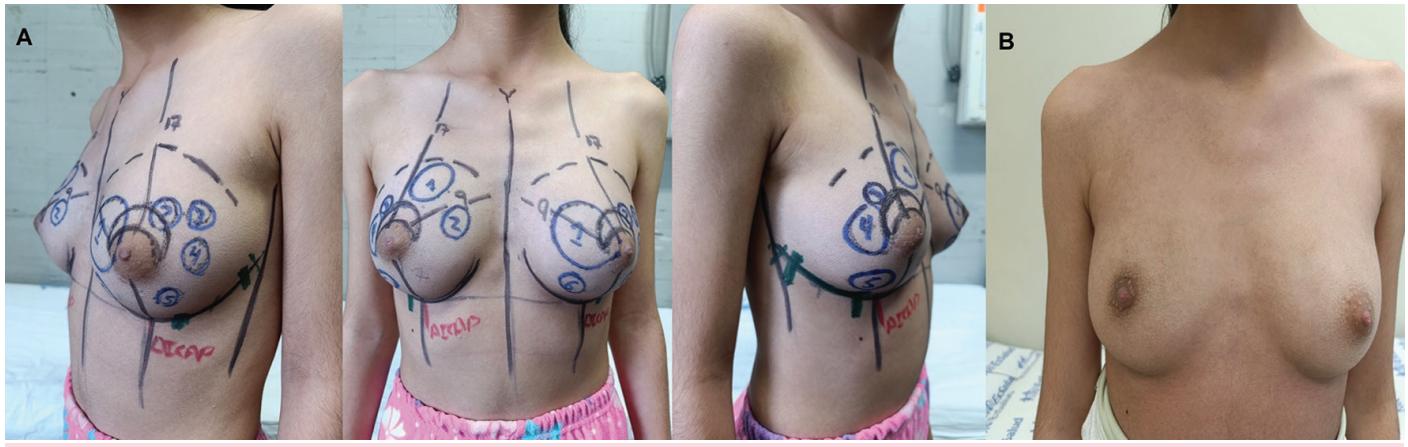

Figure 1. Case 1; (A) Preoperative image showing multiple bilateral fibroadenomas and a giant juvenile fibroadenoma in the left breast. Planned oncoplastic approaches included crescent mammoplasty and a submammary fold incision. (B) Postoperative image of the submammary fold approach at 12-month follow-up

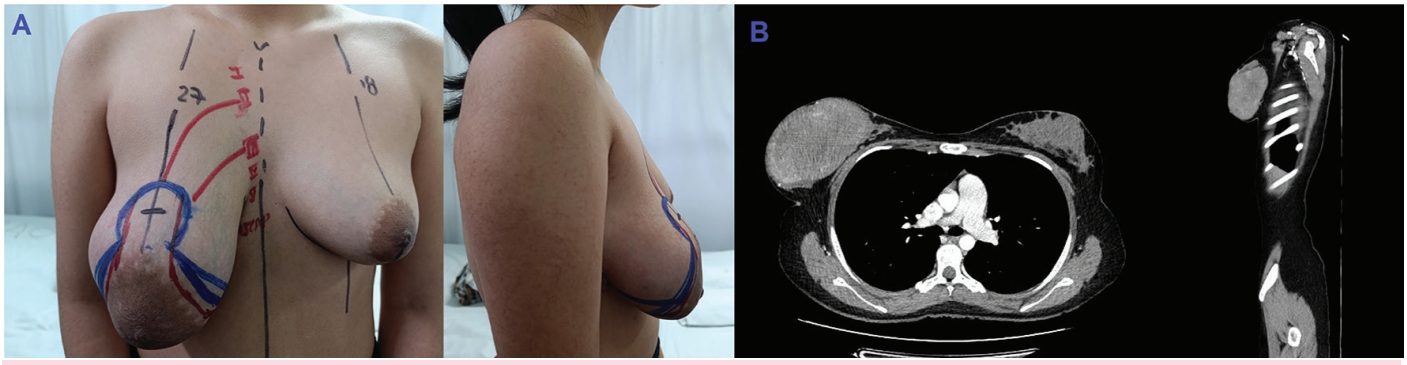

Figure 2. Case 2; (A) Preoperative image of the right breast showing the tumor and marked asymmetry. (B) Computed tomography image demonstrating the interface of the extensive tumor with the pectoralis major fascia

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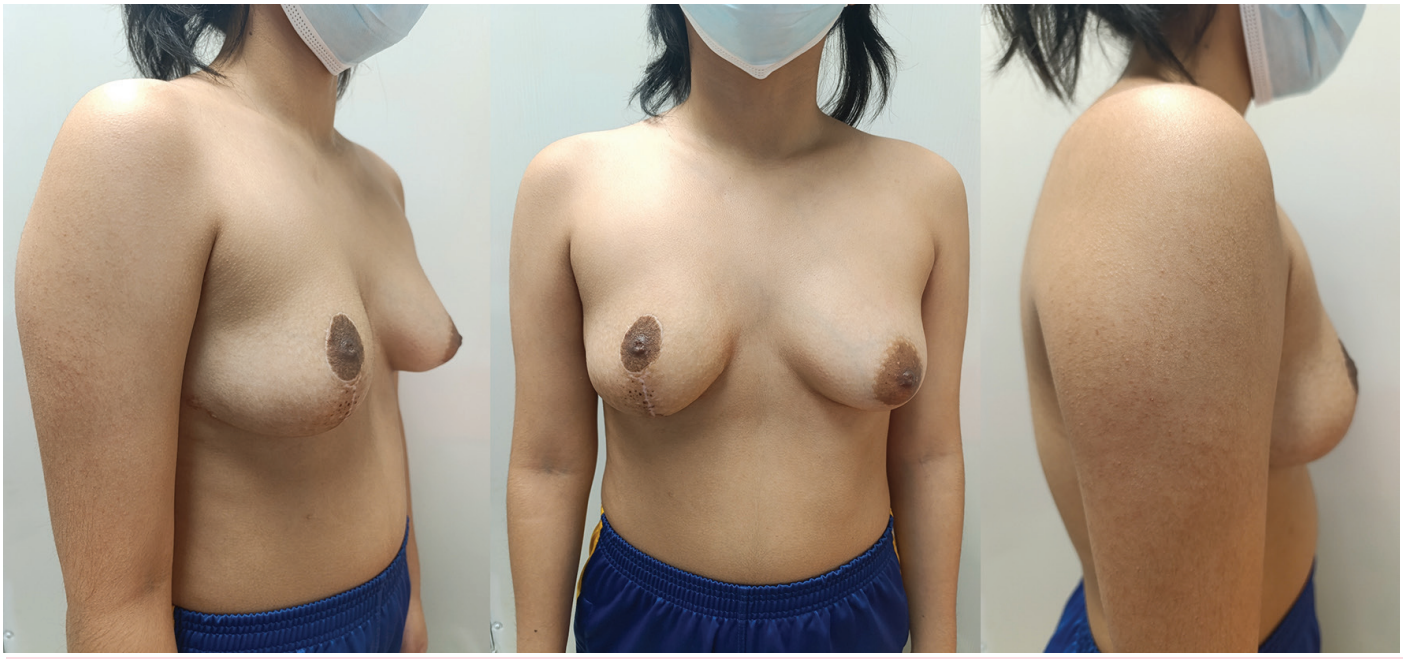

Figure 3. Case 2; postoperative image at 12-month follow-up

without skin edema (Figure 2A). An ultrasound was requested, showing a solid, hypoechoic lesion with well-defined borders measuring approximately 11x7 cm, occupying the entire right breast, with internal Doppler flow signal; categorized as BIRADS 4. A chest computed tomography scan revealed an enlarged right breast with a heterogeneous solid lesion measuring 10x8 cm, occupying a large portion of the breast (Figure 2B). A core needle biopsy showed a fibroepithelial proliferation with mild to moderate stromal cellularity, mild cellular pleomorphism, and a mitotic index of less than 1 per 10 high-power fields.

Treatment was performed using an inverted T mammoplasty (McKissock technique) and tumor enucleation by blunt dissection. The pathological report confirmed a GFA measuring 14.8x10.7x5.2 cm and weighing 720 grams. The patient had a favorable postoperative course with mild asymmetry at one-year follow-up (Figure 3). A 2 cm left breast fibroadenoma was resected and the tuberous breast was corrected using vertical mammoplasty (Lyacir R. Type I technique), resulting in an optimal outcome (Figure 4).

Case 3

A 20-year-old woman with a history of resection of two right breast fibroadenomas 2 years earlier presented with a progressively enlarging mass in the upper quadrants and a smaller mass in the lower pole of the right breast over the past 12 months. Physical examination revealed two periareolar scars; at 12 o'clock, an 8 cm well-defined, partially mobile mass without skin involvement, and at 6 o'clock, a 2 cm mass with similar characteristics (Figure 5A).

Ultrasound showed a solid, hypoechoic lesion at 12 o'clock measuring 7.6×5.8×4.6 cm and another at 6 o'clock measuring 2.2×1.9×1.8 cm, classified as BIRADS 4a. Core biopsy of the 12 o'clock lesion revealed fibroepithelial proliferation with moderate stromal cellularity, mild pleomorphism, and a mitotic index of 1/10 high-power fields, suggesting complete excision for definitive diagnosis.

The patient underwent round-block mammaplasty based on a medial pedicle, taking into account prior periareolar scars and absence of breast ptosis. Pathology confirmed a GFA (8 cm, 420 g) and a 2.2 cm fibroadenoma. Postoperatively, the patient had an uneventful course, with 10-month follow-up showing no asymmetry and only slight enlargement of the areolar diameter (Figure 5B).

Discussion and Conclusion

The management of a GFA presents a challenge due to its large dimensions, ranging from 5 to 60 cm (average 11 cm), and requires a differential diagnosis with phyllodes tumors, physiological glandular hypertrophy, and inflammatory processes before planning surgery. The most commonly used imaging methods are ultrasound (72%) and mammography (26%) (4). However, in young patients, the density of breast tissue limits the quality of mammographic images, as in the described cases where ultrasonography was used. Core needle biopsy is recommended for the evaluation of lesions larger than 3 cm and recurrent lesions; however, regression changes in GFA can mimic non-specific areas of hyalinization, making it difficult to differentiate from benign phyllodes tumors (5).

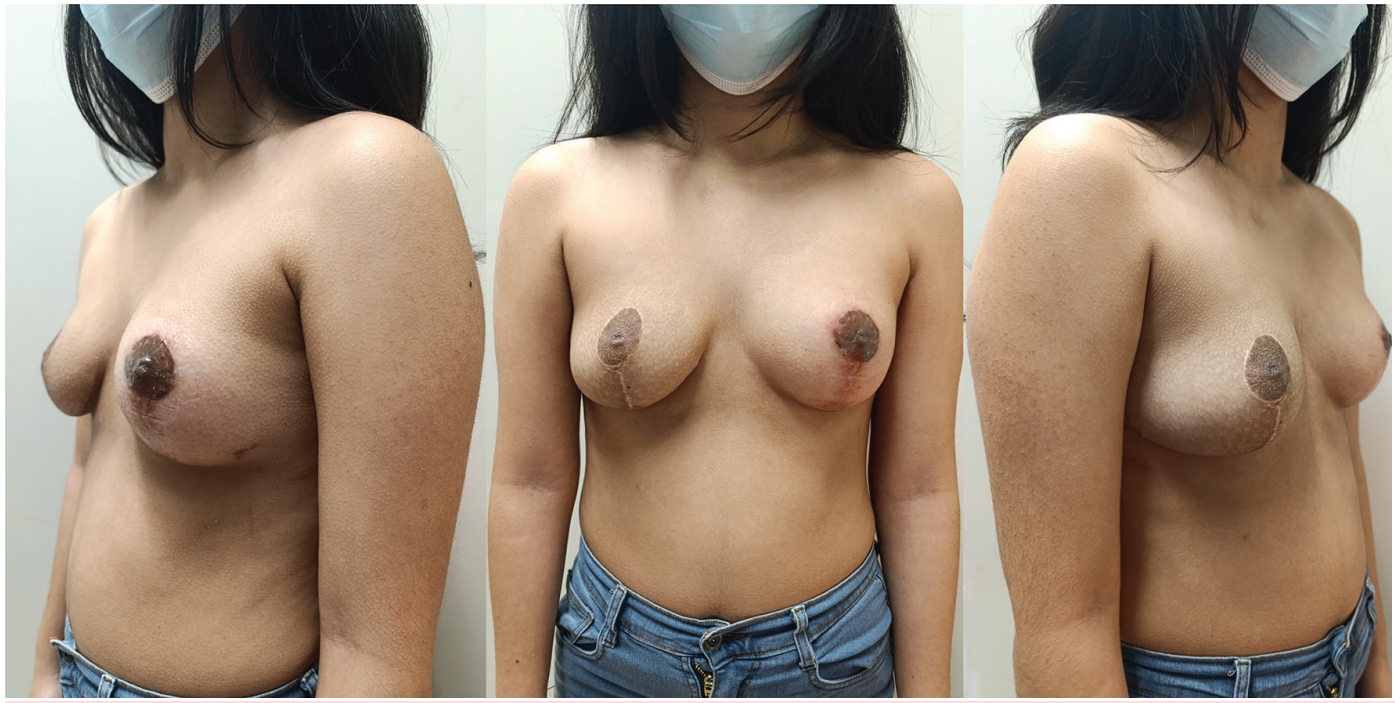

Figure 4. Case 2; postoperative image following vertical mammoplasty with breast symmetrization

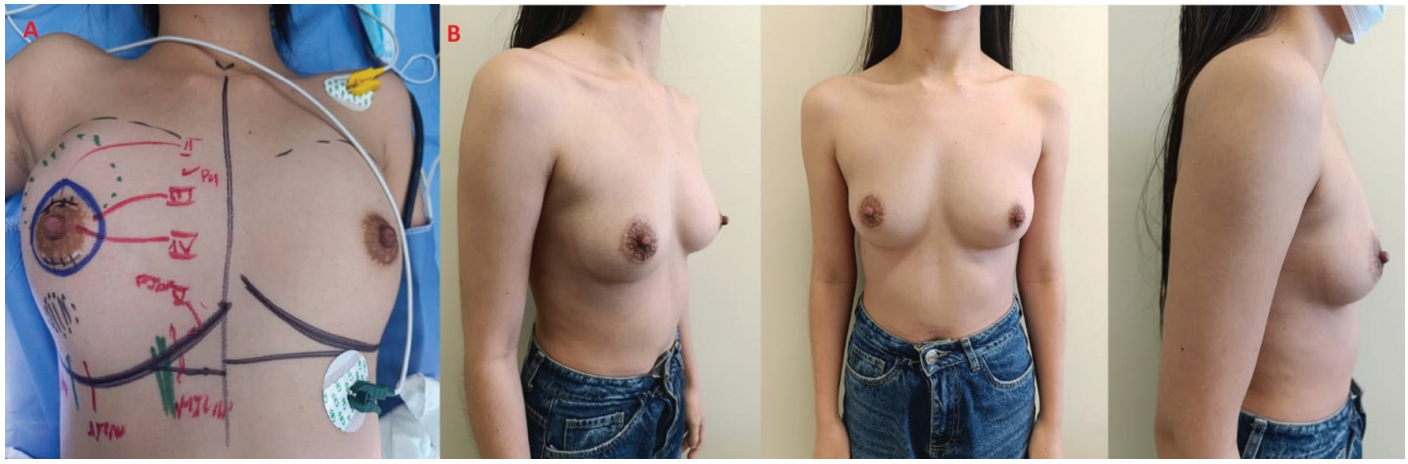

Figure 5. Case 3; (A) Preoperative image showing a giant fibroadenoma at 12 o'clock and a smaller fibroadenoma at 6 o'clock, with previous periareolar scars and round-block mammaplasty markings. (B) Postoperative follow-up at 10 months showing no asymmetry

The goal of surgical treatment is to remove the tumor with minimal dissection of ducts and lobules. The classic recommendation is a periareolar incision, given that GFAs compress healthy breast tissue, which will undergo re-expansion after resection, improving postoperative asymmetry over time (6). However, in cases where 20–50% of breast volume is lost during resection and there is grade 3 ptosis on the affected side, waiting for glandular re-expansion and adjustment of the skin envelope leads to unpredictable outcomes. Therefore, oncoplastic surgical techniques have been proposed, such as inframammary fold approach, reduction mammoplasty (inverted T technique, round block mammoplasty, crescent mammoplasty), displacement mammoplasty (horizontal mammoplasty), and in some cases, mastectomy with reconstruction (7).

In cases of mild to moderate asymmetry, an inframammary incision (low visibility) facilitates the removal of multiple lesions from different quadrants and, through blunt dissection, allows the tumors to be separated from the breast tissue while avoiding thermal, vascular, and nerve damage that could affect the nipple-areola complex (8), as in Case 1.

The recommendations for selecting a reduction mammoplasty technique such as the inverted T technique include cases of severe asymmetry, tumors averaging 15 cm in diameter, weighing over 1500 grams, and a 6 cm difference in the location of the nipple-areola complex compared to the unaffected side (9). In case 2, there was an extensive unilateral tumor that met these criteria, leading to the choice of an inverted T mammoplasty using the McKissock technique, ensuring bipedicle vascular support and appropriate surgical field exposure. Blunt dissection preserved the breast ducts, reduced the skin envelope, and repositioned the nipple-areola complex, similar to what was described by Chang and McGrath (10), with satisfactory results at twelve months of follow-up. In addition, the procedure of maintaining symmetry and correction of the contralateral tuberous breasts was performed, further improving the results obtained.

In cases with previous periareolar surgical scars, planning an oncoplastic technique must be done carefully to ensure adequate vascular supply to the nipple-areola complex, typically via a reliable vascular pedicle (such as medial or postero-inferior) (11). While the round-block technique may lead to some loss of breast projection, subsequent breast re-expansion after resection of a GFA allows preservation of breast contour and projection, as demonstrated in case 3.

GFAs are benign tumors that, due to their large size, can cause deformity, breast asymmetry, pain, discomfort, and anxiety. Surgical treatment should be selected based on the size of the lesion, the degree of asymmetry, and the level of ptosis. Oncoplastic surgery techniques for GFAs have been successfully used and are part of the currently available therapeutic options.

Ethics

Informed Consent: Written informed consent was obtained from the patients.

Footnotes

Authorship Contributions

Surgical and Medical Practices: M.C.D., G.D.l.C.K., C.C.C.L., M.d.R.C.P.; Concept: I M.C.D., G.D.l.C.K., C.C.C.L., M.d.R.C.P.; Design: M.C.D., G.D.l.C.K.; Data Collection or Processing: M.C.D., C.C.C.L., M.d.R.C.P.; Analysis or Interpretation: M.C.D., G.D.l.C.K., C.C.C.L., M.d.R.C.P.; Literature Search: M.C.D., G.D.l.C.K.; Writing: M.C.D., G.D.l.C.K., C.C.C.L., M.d.R.C.P.

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