

## Management of Huge Benign Breast Lesions by Reduction Mammoplasty

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### ABSTRACT

Huge benign breast lesions like huge fibroadenoma and hamartoma can cause breast hypertrophy which also leads to breast deformity, ptosis and asymmetry. Sixteen patients with unilateral (14 cases) and bilateral (2 cases) breast hypertrophy due to presence of benign breast lesions have been treated in the surgical department of Menoufiya University by excision of the masses and reduction mammoplasty in the same sitting. The objective of the procedure is to excise the masses and confirm the pathology and in the same time regain the normal shape of the hypertrophied and ptosed breasts. This procedure enabled us to remove multiple masses with greater efficiency due to wider exposure gained by mammoplasty incisions. At the same time the breasts were reduced to the normal size and the resultant scars were hidden in the inframammary areas. Most of our patients (11 patients) were below 21 years indicating that huge benign breast conditions causes hypertrophy and ptosis in younger patients more than older patients. This is the group who are more concerned with the cosmetic results than others. All the patients were satisfied by the results of the surgery. The complications of the procedure were limited to mild wound infection (3 cases), hypertrophic scar (4 cases), stretched scar (2 cases), flat nipple (1 case), lower nipple position (1 case), flat breast (1 case), superficial nipple necrosis (1 case) and delayed wound healing (2 cases). It was concluded that the overall results indicate that the benefits of the procedure supersedes its drawbacks as a technically demanding procedure and huge benign breast lesions can be effectively treated by this technique.

### INTRODUCTION

Benign breast disorders are a heterogenous group of lesion that clinically and radiologically span the entire spectrum of breast abnormalities. Neoplasms constitute the most important, but not the most common lesions of the female breast. The vast majority of breast masses in adolescent girls are benign, even with a history of sudden rapid enlargement. Furthermore, despite their large size they can be surgically excised

without damaging normal breast tissue, thus allowing normal bilateral development. The most common etiology of breast enlargement in adolescent girls is a juvenile fibroadenoma. Less than 5% of adolescent fibroadenomas can be classified as giant juvenile fibroadenomas. These lesions are typically solitary and by definition are larger than 5 cm in diameter or weight more than 500 gram [1-4]. Its typical presentation of a juvenile fibroadenoma is a unilaterally enlarged, painless mass in which the tumor may be larger than the existing normal breast tissue. In girls less than 15 years old, the breast enlargement can be quite sudden, sometimes within a few weeks. Despite the rapid enlargement, fibroadenomas are benign tumors [5-8].

Other entities to be considered in the differential diagnosis includes cystosarcoma phylloides (phylloides tumor), infection and benign virginal hypertrophy. Typically, virginal hypertrophy, which is bilateral and infection which is associated with rubor and tenderness can be easily distinguished from a giant juvenile fibroadenoma. Traditionally the treatment of cystosarcoma phyllodes and giant juvenile fibroadenoma has ranged from local excision to simple mastectomy. In the adolescent population the incidence of malignant cystosarcoma phyllodes is less than 1.3% [6], so the patient should be treated with the assumption that the pathology is benign. Local excision is the treatment of choice in these patients. Even with the diagnosis of cystosarcoma phyllodes, the vast majority of patients can be cured with simple excision alone and sacrifice of the breast should be

avoided [9-12]. In very large tumors, an inframammary incision is preferred to preserve the integrity of the normal developing breast parenchyma in adolescents. Since these tumors have a defined plane of dissection, the local excision can be easily performed with a "shelling out" of the tumor. Mastectomy could be done for large lesions [13-16].

Breast hamartomas are relatively rare benign lesions of the breast. Hamartomas account for 1.2% of benign lesions and 4.8% of benign breast tumors according to Charpin et al. [16]. They either present with painless breast lump or mammographically discovered. The term mammary hamartoma was first introduced by Arrigoni et al. [17]. Bilateral virginal breast hypertrophy or macromastia is a common condition encountered by plastic surgeons in patients seeking reduction mammoplasty. It is massive progressive breast enlargement disproportionate to the remainder of the body [18]. Unilateral breast hypertrophy is uncommon condition and occurs as normal breast hypertrophy or due to a variety of congenital or acquired conditions. Incorporation of reduction mammoplasty in treatment of giant benign breast conditions has three main objectives: (a) to remove the tumor mass completely; (b) to obtain symmetric breast contour after tumor resection; (c) to minimize surgical scars. The choice of reduction mammoplasty technique depend on the location of the tumor. In superiorly located tumors the inferior pedicle technique is preferred because it permits a wider field for tumor excision and in the same time it leaves the areola and nipple complex attached on the inferior pedicle with reliable blood supply and the reverse should occur in inferiorly located tumors [19]. Inverted-T scar reduction mammoplasty methods remain the standard against which newer techniques are compared and they are extremely versatile as both the skin envelope and the glandular volume can be reduced in a coordinated fashion with great precision, besides becoming applicable to wide variety of breast sizes [20]. The vertical scar reduction mammoplasty is gradually gaining land as a good alternative to the previous technique because it resects skin in only one direction and excises central vertical glandular tissues and so these improve breast projection and scar complications but this suites only mild to moderate hypertrophy [21,22]. However, long postoperative results are needed

to assess the results of unilateral reduction mammoplasty as lengthening of the distance between the nipple and inframammary line and recurrence of ptosis may occur [23].

## PATIENTS AND METHODS

From May of 1998 to June of 2002, 16 female patients with unilateral (14 cases) and bilateral (2 cases) breast hypertrophy and ptosis due to benign lesions were treated in the surgical department of Menoufiya University by excision of the masses and reduction mammoplasty in the same time. The usual presentation of the patients is progressive breast enlargement due to masses in the breasts so they seeked medical advice in the general surgery or oncology clinics then they were referred to the plastic surgeon, except in one patient who came for unilateral reduction mammoplasty in the plastic surgery clinic and benign tumor was detected on examination. The presumed diagnosis were always benign. Preoperative routine investigations, mammography and photography were done. The procedure was explained to the patients as regard the scars and possible complications.

### *Patients characteristics:*

All the patients were young females under 25 years old and the youngest was 16 years old. Most of the patients presented years after the onset due to the gradual course of the lesions especially in bilateral cases as the patient thought that this is normal breasts. One patient presented with right breast hypertrophy and neurofibromatosis in whom excisional biopsy confirmed the pathology of neurofibroma of the breast (Figs. 1a,b). Only 2 patients had moderate ptosis (the nipple is at a position 3 cm or less from the inframammary line) and the other fourteen patients had marked ptosis (the nipple is more than 3 cm below the inframammary line). One patient had long oblique scars on the anterior surface of the breast due to previous attempts to excise multiple fibroadenomas with apparent failure or recurrence of the tumors and the reduction mammoplasty procedure was planned to get ride of these scars (Figs. 3a,b,c). Another patient came for cosmetic reduction mammoplasty and fibroadenoma were found the cause of hypertrophy. All the removed specimens were studied histopathologically to confirm their benign natures.

*Tumor characteristics:*

All the tumors were easily excised totally due to well demarcation except in one case of neurofibroma in a patient with Von Recklinghausen's disease in which the tumor was bulky and irregular in shape with less marked line of cleavage among the normal breast tissues (Fig. 1b). The largest tumor was oval in shape with its length about 12 cm and its width about 8 cm (Fig. 2b). The pathology was hamartomas in 2 cases, neurofibroma in one case, giant fibroadenoma in one case, cystosarcoma phylloides in 2 cases and multiple fibroadenomas in 10 cases (Table 3). The mammographic findings of the tumors were indicating of the benign nature of the tumors as regard absence of calcifications and well demarcation.

*Surgical technique:*

The operations were performed by the general and plastic surgery teams in the same time. The operative markings of either the inferior pedicle or vertical pedicle reduction mammoplasty are drawn according to the site of the tumor with the patient standing. In superiorly situated tumors, an inferior reduction mammoplasty is planned and in inferiorly situated tumors a vertical pedicle reduction mammoplasty is planned because after tumor excision the blood supply of the areola and nipple may be hindered through that part of the breast. A wise pattern is used to mark the areola and nipple but taking into consideration that the size and site of the areola-nipple complex should match the normal side which may be ptotic to a lesser degree. The operation is performed while the patient is semi-sitting with the normal breast bared to judge on the symmetry of both sides. Deepithelialization of the marked area is achieved then the planned incisions are done. Through these incision, excision of tumors are performed with greater easiness and efficiency especially in multiple lesions and we think that there is no need to make a separate biopsy incision which well not give the same open book access to multiple tumors as the reduction mammoplasty incisions. After tumor excision the lateral and medial sectors to be excised from the skin are dealt with. The remaining breast tissues are molded to form the breast. It is amazing that in all the cases we did not need to resect normal breast tissues to regain the normal size of the breast, as we have found out that the breast hypertrophy is mainly due to the bulk

of the tumors. In bilateral cases we have the liberty of deciding the site and size of the areola-nipple complex and the size of the breast to fulfill the aesthetic requirements. Postoperative drains and strapping are applied. Postoperatively the patient is given antibiotics and dressing is done on the third day.

*Cosmetic consideration:*

The cosmetic results were evaluated by the surgical team and the patients as regard the appearance of the scars, the position and size of the areola-nipple complex and the size of the breast in comparison with the other breast. This is scored either as very good (+++), moderate (++) or fair (+).

*Follow up:*

The follow up period ranged between 3 months to 4 years, we have found out that most of the patients came regularly in the follow up visits to check for the recurrence or comment on the cosmetic result. No recurrence of the tumors was found in our cases even in the two cases with bilateral multiple fibroadenomas with different sizes. High recurrence rate is expected in the case affected by Von Recklinghausen's disease and neurofibroma of the breast due to the nature of the disease, but this is not recorded due to the fact that this case has only three months of follow up. In one patient with bilateral operation the left nipple was lower than the right and correction of the position was done 6 months later (Fig. 3b,c). In another patient revision of the scars was done due to scar hypertrophy. Follow up mammography was done for 9 patients 6 to 11 months postoperatively and revealed no recurrence of the tumors in all of them.

**RESULTS**

This is a purely cosmetic procedure which is utilized to achieve oncologic purpose. Evaluation of the results should consider the oncologic and aesthetic outcome in one hand and the complications and side effects which are related to this more complicated procedure in another hand. This is to be compared to the more simple and safer excisional biopsy. Breast hypertrophy was found mainly due to the presence of the bulk of the tumor, so that the remaining breast tissues were almost the same size of the other breast. So, the problem will remain in the re-

dundant excess skin. This is dealt with by reduction mammoplasty in very effective way. Even in bilateral cases, where numerous fibroadenomas were removed, the resultant breast tissues were almost equal. Table (1) shows the age distribution of patients and we can see that all are young females indicating that huge benign breast masses causes hypertrophy if they occur in young age rather than older patients. It is very obscure to us to found out that in unilateral conditions the right breast (12 cases) is affected more frequently than the left breast (2 cases). While bilateral affection was found in 2 cases only. Table (3) shows that the pathology varied from multiple fibroadenomas (10 cases), hamartomas (2 cases), neurofibroma (one case), cystosarcoma phylloides (2 cases) and giant single fibroadenoma (1 case). The cosmetic results were very good in 10 cases, moderate in 6 cases. This indicates the cosmetic significance of this technique. The complications which were recorded are not major and related mostly to the scar which is not considered as a complication by the oncologic team if this is compared

to the usual long excision biopsy scars with redundant, ptotic, empty and unequal breast. Table (2) shows the complications which are encountered as scar stretch (2 cases), hypertrophic scars (4 cases), mild infection resolved by dressing and antibiotics (3 cases) and delayed wound healing more than one month to heal (2 cases).

Abnormalities in shape of the breast like flat breast (2 cases) and the patient has found it not significant to undergo another operation (Figs. 4a,b). Lower position of the nipple has been seen in one case and correction was done after 6 months (Figs. 3a,b,c). And this was found to be due to the fact that after excision of multiple fibroadenomas from both breasts, the remaining normal breast tissues; although equal in size, but are not equally distributed. This lead to closure of the skin brassiere under different tensions so that at the end the nipple sagged down due to emptiness of the lower part of the breast. Superficial necrosis has occurred in one case and healed spontaneously (Figs. 1a,b,c).

Table (1): Age of the patients, affected side, pathology, complications and cosmetic results.

Case	Age	Breast involvement	Pathology of the tumor	Complications	Cosmetic results
1	18	Right	Multiple fibroadenoma	None	+++
2	17	Right	Neurofibroma (neurofibromatosis)	Scar stretch Superficial necrosis of nipple	++
3	20	Right	Cystosarcoma Phylloides	None	+++
4	16	Left	Hamartoma	Flat breast	+++
5	18	Right	Giant fibroadenoma	Scar stretch	++
6	22	Bilateral	Multiple fibroadenoma	Delayed healing Hypertrophic scars Mild infection	++
7	20	Right	Multiple fibroadenoma	Delayed healing Hypertrophic scars	++
8	18	Right	Cystosarcoma Phylloides	Hypertrophic scars	+++
9	23	Left	Multiple fibroadenoma	Flat breast Lower nipple position Mild infection	++
10	17	Right	Multiple fibroadenoma	None	+++
11	19	Bilateral	Multiple fibroadenoma	None	+++
12	29	Right	Multiple fibroadenoma	Flat nipple	++
13	17	Right	Hamartoma	None	+++
14	20	Right	Multiple fibroadenoma	None	+++
15	25	Right	Multiple fibroadenoma	Mild infection Hypertrophic scars	+++
16	21	Right	Multiple fibroadenoma	None	+++

Table (2): Complications encountered, number of affected patients and management.

Type of complication	No. of affected cases	Management
Scar stretch	2	None
Hypertrophic scars	4	Conservative treatment in 3 cases and revision of scars in one case
Mild infection	3	Conservative treatment
Delayed healing (more than 1 month)	2	Conservative treatment
Lower nipple position	1	Surgical correction
Flat nipple	1	None
Superficial nipple necrosis	1	Conservative treatment
Flat breast	2	None

Table (3): Histopathology of the excised specimens and their prevalence in the affected patients.

Pathology	No. of cases	Percentage of cases
Multiple fibroadenoma	10	62.5
Giant single	1	6.2
Fibroadenoma		
Cystosarcoma phylloides	2	12.5
Hamartoma	2	12.5
Neurofibroma	1	6.2



Fig. (1,A): A girl with right breast hypertrophy due to presence of neurofibroma of the breast with generalized neurofibromatosis.



Fig. (1,B): Excision of the non capsulated irregular tumor, characteristic of neurofibroma and after closure of reduction mammoplasty incisions.



Fig. (1,C): Postoperative result of the same patient after 3 weeks with progressive healing of the superficial sloughing of the nipple.



Fig. (2,A): Preoperative picture of a girl with right breast hypertrophy due to presence of cystsarcoma phylloides tumor.



Fig. (2,B): Intraoperative picture of the same patient with the giant well capsulated tumor easily excised.



Fig. (3,A): Bilateral breast hypertrophy due to multiple fibroadenomas with the scars of previous attempts of excision with residual or recurrent tumors.



Fig. (2,C): Postoperative picture of the same patient after 6 months.



Fig. (3,B): Early postoperative picture of the same patient with successful discarding of the previous scars, but with lower position of the left nipple.



Fig. (3,C): Same patient after revision of the position of the left nipple.



Fig. (4,A): Left breast hypertrophy due to giant fibroadenoma.



Fig. (4,B): Postoperative picture of the same patient with flat left breast.

### DISCUSSION

Benign tumors like giant fibroadenoma, benign cystosarcoma phylloides or hamartoma can produce unilateral or bilateral breast hypertrophy [24,25]. Between 250,000 and 500,000 breast mass biopsies are performed each year in USA. This is a common procedure of the breast that should be planned such that maximum treatment is achieved with minimal disfigurement and scarring. Plastic surgery techniques must be used in the choice of biopsy site and planned excision and can result in an improved cosmetic result for the patient. Awareness of the basic reconstructive principles by the general surgeon can minimize disfigurement and facilitate future reconstruction by the plastic surgeon so that both cure and cosmesis can be achieved [26]. Integration of plastic surgery is currently widely practiced in cases of mastectomy. Immediate breast reconstruction with an implant or autologous tissue procedures is frequently proposed to the patient before the mastectomy. Reduction of the opposite breast should be taken as a good opportunity to check the glandular tissue as occult carcinomas, half of them infiltrating, were found in 4% of a series of 350 symmetry procedures performed during breast reconstruction at the Gustave Roussy Cancer Institute. This concludes that

close collaboration between oncologists and plastic surgeons is required not only to obtain the best cosmetic results but also to allow improved radicality of the tumor resection and a histological check-up of the contralateral breast [27].

This is a purely cosmetic procedure which is utilized to achieve an oncologic objective; a fact which the pioneers of reduction mammoplasty did not think of when they have invented that procedure. The objectives of this procedure are: to remove the tumor mass completely, to obtain a symmetric breast contour and to minimize visible scars. The majority of breast masses in young females are benign even if they cause rapid enlargement, furthermore they can be surgically removed without damaging normal breast tissues. But removal of these masses will end with a pendulous asymmetric breasts with visible scars. Application of reduction mammoplasty technique has solved this problem in our hands. We have found out an interesting findings, that the breast hypertrophy caused by these benign breast masses is due to the bulk of the masses only, so that the remaining normal breast tissues are equal to the normal breast. So, in performing the reduction mammoplasty, we resect the redundant expanded skin rather than the normal breast tissues.

Even in bilateral cases the remaining normal breast tissues are much alike. We agree to a great extent with Yamamoto et al., in that the selection of the technique has to depend on the location of the tumor. We have used the inferiorly based reduction mammoplasty in superiorly located tumors as mentioned by Yamamoto et al., but we preferred the vertical pedicle reduction mammoplasty of McKissock in inferiorly located tumors instead of the superiorly pedicled technique [28]. Contrary to Yamamoto et al., we do not use a separate biopsy incisions beforehand and we start the procedure by doing the reduction mammoplasty incisions. In our opinion these incisions give an open-book exposure of the breast so that multiple fibroadenomata of different sizes can be excised more efficiently minimizing the recurrence to a great extent and this in our opinion is one of the great advantages of the procedure. Additional advantage of this procedure is to get ride of previous excisional biopsy scars which may be very disfiguring. The complications recorded in this study are cosmetic in nature to a great extent and are not considered by the oncology team as complications at all. No recurrence has been recorded in our cases even in bilateral multiple fibroadenomata.

Revision surgery was done in two cases to correct lower nipple position in one case and to revise the scars in another case. Lower nipple position was found to be due to the fact that after excision of multiple fibroadenomas from both breasts, the remaining normal breast tissues; although equal in size, but are not equally distributed. This lead to closure of the skin brassiere under different tensions so that at the end the nipple sagged down due to emptiness of the lower part of the breast. We should bear in mind the fact that the breast to be reproduced is not an ideal, cosmetically pleased one, but one that matches the already existing contralateral breast [29]. We were able to do that in most of the cases but we noticed in two of the early cases that the operated breast was flatter than the other breast. We could avoid that in other cases by judging the degree of the divergences of the lateral and medial limbs of the Wise pattern, so that after closure of the two limbs the width of the operated breast can match the normal breast. We think this procedure has achieved its oncologic and cosmetic goals very satisfactorily and could be used routinely in similar cases.

## REFERENCES

- 1- Cotran R.S., Kumar V., Robbins S.L. and Robbins: Pathological basis of disease, fourth edition. W.B. Saunders Company. Philadelphia. London. Toronto. Montreal. Sydney. Tokyo., 1181-1204, 1989.
- 2- Simmons R.M., Cance W.G. and Iacicca M.V.: A giant juvenile fibroadenoma in a 12-year-old girl: A case for breast conservation. *Breast Journal*, 6: 418, 2000.
- 3- Musio F., Mozingo D. and Otchy D.P.: Multiple giant fibroadenoma. *Am. J. Surg.*, 57: 438, 1991.
- 4- Nambiar R. and Kutty K.: Giant fibro-adenoma (cystosarcoma phylloides) in adolescent females-a clinicopathological study. *Br. J. Surg.*, 61: 113, 1974.
- 5- Farrow J.H. and Ashikari R.: Breast lesions in young girls. *Surg. Clin. N. Am.*, 49: 261, 1969.
- 6- Ashikari R., Farrow J.H. and Ohara J.: Fibroadenomas in the breast of juveniles. *Surg. Gynecol. Obstet.*, 132: 259, 1971.
- 7- Hines J.R. and Geurkink R.E.: Giant breast tumor in the adolescent. *Am. J. Surg.*, 109: 810, 1965.
- 8- Pike A.M. and Oberman H.A.: Juvenile (cellular) adenofibromas. *Am. J. Surg. Pathol.*, 9: 730, 1985.
- 9- Briggs R.M., Walters M. and Rosenthal D.: Cystosarcoma phylloides in adolescent female patients. *Am. J. Surg.*, 146: 712, 1983.
- 10- Stromberg B.V. and Golladay E.S.: Cystosarcoma phylloides in the adolescent female. *J. Pediatr. Surg.*, 13: 423, 1978.
- 11- Gogas J., Sechas M. and Skalkeas G.: Surgical management of diseases of the adolescent female breast. *Am. J. Surg.*, 137: 634, 1979.
- 12- Mc Donald J.R. and Harrington S.W.: Giant fibroadenoma of the breast "cystosarcoma phylloides". *Ann. Surg.*, 131: 242, 1950.
- 13- Mc Divett J.E.: Giant fibroadenoma of the breast. *Ca. J. Surg.*, 17: 205, 1974.
- 14- Kuuck U.: Multiple fibroadenomas in an adolescent female breast. *Can. J. Surg.*, 31: 133, 1988.
- 15- Oberman H.A.: Breast lesions in the adolescent female. *Pathol. Annu.*, 14: 175, 1979.
- 16- Charpin C., Mathoulin M.P. and Andrac L.: Reappraisal of breast hamartoma. A morphological study of 41 cases. *Pathol. Res. Pract.*, 190: 362, 1994.
- 17- Arrigoni M.G., Dockerty M.B. and Judd E.S.: The identification and treatment of mammary hamartoma. *Surg. Gynecol. Obstet.*, 133: 577, 1971.
- 18- O, Hare P.M. and Frieden I.J.: Virginal breast hypertrophy. *Pediatr. Dermatol.*, 17: 277, 2000.
- 19- Yamamoto Y. and Sugihara T.: Application of reduction mammoplasty in the treatment of giant breast tumour. *Br. J. Plast. Surg.*, 51: 109, 1998.



- 20- Hidalgo D.A., Elliot L.F., Palumbo S., Casas L. and Hammond D.: Current trends in breast reduction. *Plast. Reconstr. Surg.*, 104: 806, 1999.
- 21- Lassus C.: A 30 years experience with vertical mammoplasty. *Plast. Reconstr. Surg.*, 97: 373, 1996.
- 22- Lejour M.: Vertical mammoplasty and liposuction of the breast. *Plast. Reconstr. Surg.*, 94: 100, 1994.
- 23- Hoffman S.: Recurrent deformities following reduction mammoplasty and correction of breast asymmetry. *Plast. Reconstr. Surg.*, 78: 55, 1986.
- 24- Iverson R.E. and Hegg S.I.: Cystosarcoma phylloides presenting as massive breast hypertrophy in an adolescent. *Ann. Plast. Surg.*, 4: 314, 1980.
- 25- Stromberg B.V. and Golladay E.S.: Cystosarcoma phylloides in the adolescent female. *Pediatr. Surg.*, 13: 423, 1978.
- 26- Shaw T., Cohen R., Jansen D. and Mckinnon W.: Revisiting breast masses with the plastic surgeon: suggestion for biopsy and resection. *Am. Surg.*, 66: 1077, 2000.
- 27- Clough K.B., Nos C., Salmon R.J., Soussaline M. and Durand J.C.: Conservative treatment of breast cancers by mammoplasty and irradiation: a new approach to lower quadrant tumors. *Plast. Reconstr. Surg.*, 96: 363, 1995.
- 28- Mckissock P.K.: Reduction mammoplasty with a vertical dermal flap. *Plast. Reconstr. Surg.*, 49: 245, 1972.
- 29- Berrino P., Galli A., Rainero M.L. and Sainti P.: Unilateral reduction mammoplasty sculpturing the breast from the undersurface. *Plast. Reconstr. Surg.*, 82: 88, 1988.