A single stage liposuction and dermopexy for grade 3b and grade 4 pseudogynecomastia after massive weight loss: An observational study

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Abstract Nineteen middle-aged males with grade 3b and grade 4 pseudogynecomastia following severe weight loss were treated by liposuction and simultaneous skin reduction. From 1997 through 2005 nine males with grade 3 and ten with grade 4 pseudogynecomastia were included in this study. Ages ranged from 23 to 48 years. Author used two techniques for skin reduction: 1-the dermal mastopexy (keyhole design) for grade 4, and 2-the complete circum-areolar technique (concentric reduction) with de-epithelialization for grade 3b.

The current technique offers a proper treatment for the pendulous female-like breast with inelastic and redundant skin. It obviates the need for secondary revision by providing a viable nipple-areola complex at the desired location and eliminating the dish-type deformity that may result from subcutaneous mastectomy. Patients were monitored for the following 18 to 39 months.

While reviewing the literature other methods are compared and discussed but it is suggested that the method reported here has a number of advantages and is the treatment of choice in many such cases.

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Introduction

Gynecomastia is abnormal enlargement of the breast in adolescent and adult males. Unfortunately the term suggests feminization but it can and does occur in virile men and, although harmless, is a source of embarrassment. Psychological distress is the main indication for surgical treatment.

In the current classification of pseudogynecomastia, grades 3b and 4 are defined as severe hypertrophy with type I ptosis for grade 3b and with types II and III ptosis for grade 4. Previously this severe pseudogynecomastia, simulating a pendulous female breast, has been treated with mastectomy and free nipples graft or treated with liposuction and staged skin reduction over several months. In this report on middle-aged patients with grades 3b, 4a and 4b pseudogynecomastia our approach has been single-stage liposuction and skin reduction. These patients had lost a lot of weight, producing a female-like breast but with

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reduced glandular breast tissue due to middle age (pseudogynecomastia).

Recently many authors have reported the efficacy of ultrasound-assisted liposuction in all grades of gynecomastia with the possibility of staged resection of the skin over several months. We believe that skin redundancy following liposuction alone or following subcutaneous mastectomy does not retract or shrink, and meanwhile relocation of the nipple-areola complex is needed. We used two techniques for skin resection: 1-the dermal mastopexy (keyhole design) for grade 4, and 2-the complete circum-areolar technique (concentric reduction) with de-epithelialization for grade 3b. The technique obviates the need for skin retraction in a second operation, allows immediate skin recontouring, and there is no necrosis of the nipple-areola complex.

**Patients and methods**

**Patients**

From 1997 through 2005 nine males with grade 3 and ten with grade 4 pseudogynecomastia were treated. Ages ranged from 23 to 48 years. Seventeen of these had lost 40 to 75 kgs in weight following gastric banding with the result that the distance between the nipple and suprasternal notch varied from 22 cm to 25 cm and the areola size ranged from 2.8 to 8 cm in diameter. All underwent a single stage liposuction and skin reduction under general anesthesia. Post-operative monitoring continued for 18 to 39 months.

Diagnostic measures were individualized based on abnormal findings in history and general examination in order to exclude underlying pathological causes. General examination includes assessment of the thyroid, testicles, liver, lungs, malignancy and signs of feminization. Local examination of the breast includes degree of ptosis, skin redundancy, the distance between nipple/areola complex and suprasternal notch, nipple discharge, nipple enlargement, and breast masses.

**Techniques**

In order to make the tissue as tense as possible to facilitate liposuction a tumescence of 2:1 was created by infusing 0.1% lidocaine in epinephrine/saline 1/100,000 concentration. Liposuction was by the traditional vacuum pump method (High powered aspirator 11; Wells Johnson Co., Tucson, Arizona # 2336) starting with a cannula 4 mm in diameter and 15–25 cm long. The stab wound measured 0.5 cm in the anterior axillary line at a level convenient to the surgeon. Suction was limited to the thin superficial layer of the breast and was kept at the subdermal level beneath the nipple/areola complex to preserve the subdermal plexus. Towards the end of the procedure a 3 mm cannula with sharp edges and multiple holes was used to break down the remaining fibrous tissue. The total volume of liposiprate from each breast varied from 440 cc to 480 cc. An adequate layer of subcutaneous fat was left in order to keep the mild fullness characteristic of the normal male breast and to preserve the normal projection of the nipple-areola complex.

**Skin reduction techniques**

**Grade 3b pseudogynecomastia**

Following the liposuction the amount of skin around the areola that will be resected is determined; the complete circumareolar cutaneous ring being marked (Fig. 1) with the patient in a sitting position. In patients with areola enlargement an inner ring with a diameter measuring 25 mm to 30 mm is marked around the nipple. De-epithelialization of the skin between the inner and outer ring includes both normal and pigmented skin with no subcutaneous undermining at the periphery of the outer ring. The wound is then closed with a few interrupted absorbable and inverted sutures (Vicryl #4-0) placed in the deep dermal plane and skin closed with interrupted mattress sutures (Nylon #4-0) with knots placed on the pigmented skin of the areola.

**Grade 4a and grade 4b pseudogynecomastia**

This type of patient has a pendulous female-like breast, and relocation of the nipple-areola complex is needed. Our approach to this has been a single stage liposipraction and dermopexy using the conventional keyhole design.
A mid-clavicular line is drawn across the areola and then across the submammary sulcus and is marked 'D'; the new site of a nipple 20 cm from the sternal notch is marked 'A'. The amount of excess skin is grasped, estimated and marked 'B—C'. An inverted triangle is then drawn with its tip 'D' and its base 'B—C' (Fig. 2). De-epithelialization of the skin is started. A release transverse incision along the dermis and inferior to the areola might be needed to facilitate the transposition of the areola upwards. Undermining of the subcutaneous tissue to a depth of 1 cm can be helpful for easy and proper skin closure using inverted absorbable sutures (4-0 vicryl) for closure of the subdermal layer and nylon sutures (5-0) for subcuticular closure of the skin. At the end of the procedure a dog-ear revision is often needed by performing a limited transverse elliptical excision of the excess skin and subcutaneous tissue on both sides of the vertical incision. In both techniques we removed the suction drain after 48 h.

Results

Nine males with grade 3b; Type 1 ptosis (Figs. 3,4) underwent conventional liposuction combined with complete circumareolar approach (concentric reduction). There was no nipple and areola necrosis; the level of the areola remained the same and areola sensitivity was not affected. The size of the areola enlarged slightly in one patient but the size was still aesthetically acceptable (Figs. 5,6). In one patient the periareolar scar became wider but they did not ask for revision. Mild residual skin redundancy was noticed in one patient.

Ten males with grade 4, Types 2, 3 ptosis (Figs. 7,8) underwent liposuction combined with keyhole design dermal mastopexy. One of these experienced temporary sensory impairment of the nipple-areola complex, All were satisfied with the inverted 'T' scar. (Figs. 9,10) Bilateral superficial peeling of the areola occurred in one patient. Nipple to sternal notch distance measured 20—21 cm in this entire group (Table 1). In both groups the patients had normal...
flat male breasts with a normal slight fullness of the chest contour Figs. 5 and 6.

Discussion

Most grades 3 and 4 pseudogynecomastia appear to be hypertrophy of fat in the vicinity of the breast due to generalized obesity rather than hypertrophy of the glandular or fibrous tissues of the breast. As most men have relatively little glandular breast tissue in their middle and later years of life, liposuction can be used effectively to reduce pseudogynecomastia but the problem becomes worse after massive loss of weight where skin resection is required.

The aim of this report is to offer a one-stage treatment for the pendulous female-like breast (grades 3 and 4 pseudogynecomastia) with inelastic and redundant skin that happened after massive and rapid weight loss Figs. 7 and 8. It obviates the need for secondary skin resection and providing a viable nipple-areola complex at the desired location.

In 2003 Rohrich1 proposed a new classification of gynecomastia based on the amount of breast hypertrophy and the degree of ptosis; grade I patients having minimal hypertrophy; grade II patients having moderate hypertrophy; grades III and IV patients having severe hypertrophy; grade III patients exhibiting grade 1 ptosis, and grade IV patients exhibiting grades 2 or 3 ptosis. Rohrich treated all grades successfully with ultrasound-assisted liposuction technique with delayed excision of excess skin in order to minimize scarring.

Letterman and Schurter2 addressed the problem of excess skin following reduction of the breast through an intra-areolar incision by de-epithelializing a crescent of skin to the areola and advancing the nipple upwards. Pers and Bretteville3 treated large and ptotic male breasts with nipple transposition on a vertical dermal bi-pedicled flap. In massive gynecomastia, Simon et al.4 recommended radical excision with free nipple transplantation. Wray et al.5 described en bloc resection of excess skin and breast tissue and placed the final scar in the inframammary crease. Davidson6 presented the concentric circle technique in which the nipple/areola complex is transposed on a dermal pedicle. Huang et al.7 presented a modification of the concentric technique, the nipple and areola transposed as an apple core with its vascular supply from the chest wall. In 1999 Chiu8 proposed the pinwheel technique

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Patient age (years)</th>
<th>Grade of gynecomastia</th>
<th>Procedures</th>
<th>Amount of lipoaspirate from one breast</th>
<th>Complications</th>
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<tbody>
<tr>
<td>1</td>
<td>28</td>
<td>3b</td>
<td>Liposuction and circumareolar skin reduction</td>
<td>390 cc</td>
<td>–</td>
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<tr>
<td>2</td>
<td>31</td>
<td>3b</td>
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<td>340 cc</td>
<td>Widening of the periareolar scar</td>
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<td>3b</td>
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<td>420 cc</td>
<td>Mild enlargement of the areola</td>
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<td>4</td>
<td>42</td>
<td>4a</td>
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</tr>
<tr>
<td>5</td>
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<td>4a</td>
<td>Same</td>
<td>470 cc</td>
<td>–</td>
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<tr>
<td>6</td>
<td>27</td>
<td>4b</td>
<td>Same</td>
<td>360 cc</td>
<td>–</td>
</tr>
<tr>
<td>7</td>
<td>26</td>
<td>4b</td>
<td>Same</td>
<td>390 cc</td>
<td>–</td>
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<tr>
<td>8</td>
<td>48</td>
<td>4b</td>
<td>Same</td>
<td>420 cc</td>
<td>–</td>
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<tr>
<td>9</td>
<td>23</td>
<td>3b</td>
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<tr>
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<td>40</td>
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<tr>
<td>11</td>
<td>34</td>
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<td>410 cc</td>
<td>Residual redundancy</td>
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<tr>
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<td>23</td>
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<td>370 cc</td>
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<td>29</td>
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<td>500 cc</td>
<td>–</td>
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<tr>
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<tr>
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<td>27</td>
<td>3b</td>
<td>Same</td>
<td>370 cc</td>
<td>Temporal impaired sensation of nipple-areola complex</td>
</tr>
<tr>
<td>19</td>
<td>27</td>
<td>4b</td>
<td>Liposuction and dermal mastopexy (keyhole design)</td>
<td>390 cc</td>
<td>–</td>
</tr>
</tbody>
</table>
and claimed that his technique facilitated the delivery of a large mass of breast tissue through a relatively small incision.

In our study pseudogynecomastia was treated by simultaneous liposuction and skin excision but without the mastectomy reported in many other procedures. The skin excision procedure was similar to that of dermal mastopexy of the female breast described by Goulian and that of concentric reduction reported by Persichetti who described the complete circumareolar technique with purse-string suture in eleven patients with moderate and severe ptotic and glandular breast enlargement.

Skin redundancy following liposuction or following subcutaneous mastectomy for severe pseudogynecomastia that simulates the pendulous female breast does not shrink. In addition, massive loss of weight as in our series increases the skin redundancy and necessitates skin reduction to allow immediate breast recontouring. Patients presenting in the middle and later years of life with a female-like breast are mostly suffering pseudogynecomastia due to atrophy of the fibroglandular tissue of the breast and hypertrophy of the fatty tissue as a part of male central obesity; most cases remain idiopathic. Hence there is a role for liposuction.

In the current report, 17 patients had received gastric banding to lose weight, which they did to a considerable extent. As they had inelastic and redundant skin a single stage liposuction combined with skin reduction (Dermopexy) seemed a solution to the problem.
In the last 20 years, liposuction has replaced subcutaneous mastectomy for treatment of mild and moderate pseudogynecomastia with no skin redundancy. And recently many authors used the ultrasound-assisted liposuction technique, and reported several advantages over the conventional suction lipectomy such as selective cavitations of fat cells, easy removal of dense fibrotic parenchymal tissue, allowing for skin retraction, and less physical effort is needed. Liposuction can offer a better aesthetic outcome because it eliminates the dish type deformity that may result from over-resection by mastectomy of the breast tissue. We used the standard (traditional) suction-assisted lipectomy with the wet technique and we did not find any difficulty in achieving good results.

In 1973 Simon and co-workers\textsuperscript{4} offered an excellent classification and instructions for graduated treatment of pseudogynecomastia based on the degree of lipodystrophy and skin excess. Minor breast enlargement without skin redundancy was grade 1, moderate breast enlargement without skin redundancy grade 2a, moderate breast enlargement with minor skin redundancy grade 2b, and gross breast enlargement with skin redundancy that simulates a pendulous female breast was grade 3.

Previously these patients were treated by different methods:

1. Simple mastectomy and free nipple-areola graft as reported by Murphy\textsuperscript{11} with the disadvantage of a long transverse scar and the possibility of graft loss.
2. Ultrasound-assisted liposuction and staged excision of the remaining redundant skin after several months as described by Rohrich\(^1\) with patients experiencing prolonged anxiety while waiting for skin shrinkage, which might not occur, and a consequent need for secondary surgery in ptotic breasts of grades 3b and 4.

3. Nipple-areola transposition on a pedicle flap described by many authors,\(^{12,13}\) which may result in a prominent nipple-areola complex but with vascularity and sensibility still intact.

The use of the dermal mastopexy technique described by Goulian\(^9\) for ptotic female breast prompted the author to apply the same procedure on the ptotic female-like breast of a man in order to excise almost the whole of the excess skin remaining after completion of liposuction and to bring the nipple-areola complex to the desired location Figs. 9 and 10. The only drawback of our technique is the obvious inverted T-shaped scar in grade 4 (pendulous female breast) but patients accept the scar and seem satisfied with the results.

**Conclusion**

For pseudogynecomastia of the middle-aged male breast we believe that single stage liposuction and skin reduction is a very reliable tool. It offers a proper treatment for the pendulous female-like breast with inelastic and redundant skin whether or not due to massive loss of weight and it obviates the need for secondary revision by providing a viable nipple-areola complex at the desired location and eliminating the dish-type deformity that may result from subcutaneous mastectomy.

**References**